4-6-1989

1988 - 1991 Bulletin

Loma Linda University

GRADUATE SCHOOL

1988-91 BULLETIN

LOMA LINDA UNIVERSITY

Bulletin of LOMA LINDA UNIVERSITY
Graduate School 1988-91

The information in this BULLETIN is made as accurate as is possible at the time of publication. Students are responsible for informing themselves of and satisfactorily meeting all requirements pertinent to their relationship with the University. The University reserves the right to make such changes as circumstances demand with reference to admission, registration, tuition and fees, attendance, curriculum requirements, conduct, academic standing, candidacy, and graduation.

BULLETIN OF
LOMA LINDA UNIVERSITY
Volume 80, Number 4, April 6, 1989

Published once a month February 6; twice a month March 7, 22; thrice a month April 6, 20, 27; once a month May 16; once a month July 5; once a month August 8.

Entered June 7, 1923,
as second-class matter,
Loma Linda, California 92350
USPS 0-74-440

graduate school

This is a *three-year* BULLETIN

LOMA LINDA UNIVERSITY

1988-91

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LOMA LINDA UNIVERSITY is a two-campus, Seventh-day Adventist coeducational institution located in inland southern California and is part of the Seventh-day Adventist system of higher education.

On the La Sierra campus, at the west edge of Riverside, curricula in applied and liberal arts and sciences, undergraduate and graduate business and management, pre-professional programs for the health-related professions, and programs in professional education in fulfillment of requirements for teaching credentials are offered by the College of Arts and Sciences, the School of Business and Management, the School of Education, and the School of Religion. On the Loma Linda campus, in the San Bernardino-Redlands area, professional curricula are offered by the Schools of Allied Health Professions, Dentistry, Medicine, Nursing, and Public Health. Graduate programs are offered from both campuses through the Graduate School.

Accredited by the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges and the North American Division Commission on Accreditation of the Board of Regents of the General Conference of Seventh-day Adventists, Loma Linda University is a member of the American Council on Education and the Association of American Colleges. The professional curricula of the University are approved by their respective professional organizations.

Curricula are offered leading to the Associate in Arts, Associate in Science, Bachelor of Arts, Bachelor of Business Administration, Bachelor of Fine Arts, Bachelor of Music, Bachelor of Science, Bachelor of Social Work, Master of Arts, Master of Business Administration, Master of Health Administration, Master of Public Health, Master of Science, Master of Science in Public Health, Specialist in Education, Doctor of Dental Surgery, Doctor of Education, Doctor of Health Science, Doctor of Medicine, Doctor of Philosophy, and Doctor of Public Health degrees.

The core of the combined faculties consists of approximately 846 full-time teachers. Part-time and voluntary teachers, especially clinicians in the professional curricula, bring the total past 1,990. Men and women from as many as 100 nations are represented in the annual enrollment of nearly 4,400 students.

NONDISCRIMINATION POLICY

The University was established by the Seventh-day Adventist church as an integral part of its teaching ministry.

The University is committed to equal education and employment opportunities for men and women of all races and does not discriminate on the basis of handicap, sex, race, color, or national origin in its educational and admissions policies, financial affairs, employment programs, student life and services, or any University-administered program.

To this end, the University is in compliance with Titles VI and VII of the Civil Rights Act of 1964 as amended, and substantial compliance with Title IX of the Education Amendments of 1972 (45 CFR 86 et seq.) and Sections 503 and 504 of the Rehabilitation Act of 1973. The University also complies with the Age Discrimination in Employment Act of 1967 and Section 402 of the Vietnam Era Veterans Adjustment Act of 1974 and does not discriminate against any employee or applicant for employment on the basis of age or because they are disabled veterans or veterans of the Vietnam era. In addition, the University administers student programs without discrimination on the basis of age, except in those programs where age is a bona fide academic qualification for admission in accordance with the provisions of the Age Discrimination Act of 1975.

The University reserves constitutional and statutory rights as a religious institution and employer to give preference to Seventh-day Adventists in admissions and employment. The University believes that Title IX regulations are subject to constitutional guarantees against unreasonable entanglement with or infringements on the religious teachings and practices of the Seventh-day Adventist church. The University expects students and employees to uphold biblical principles of morality and deportment as interpreted by the Seventh-day Adventist church. The University claims exemptions from the provisions of Title IX set forth in CFR Sections 86.21, 86.31, 86.40, and 86.57(b) insofar as they conflict with church teachings and practices of morality, deportment, and appearance.

AFFIRMATIVE ACTION

The University routinely monitors its educational and employment practices regarding women, minorities, and the handicapped to ensure compliance with the law and University policy. The University's affirmative action policy is to provide equal access to admissions, educational programs and activities, financial aid, student services, and employment.

In compliance with Title IX of the Educational Amendments of 1972 and Section 504 of the Rehabilitation Act of 1973, a grievance procedure has been established to process student complaints alleging violation of these regulations or of the University's policy of nondiscrimination based on sex or handicap. Inquiries concerning Title IX may be directed to the dean of students. Employment-related discrimination complaints, including those filed by student employees, are processed in conformity with the provisions outlined in existing staff personnel policies. Complaints related to discrimination in academic areas are reviewed in conformity with the procedures established by the academic administration.

LOMA LINDA UNIVERSITY

HISTORY

Loma Linda University has grown out of the institution founded at Loma Linda, California, by the Seventh-day Adventist church in 1905. The original schools — Nursing and Medicine — have been joined by Allied Health Professions, Dentistry, and Public Health on the Loma Linda campus. In 1967 the former La Sierra College joined the University, adding the College of Arts and Sciences and the School of Education. In 1986 the School of Business and Management was established. The University now comprises two campuses — one at Loma Linda and one in Riverside (La Sierra), California. The School of Religion, established in 1987, and the Graduate School are administered on both campuses.

The University, operated by the Seventh-day Adventist church, is committed to the vision of its founders and sustained by its close association with the church.

PHILOSOPHY

As implied by its motto, *To Make Man Whole,* the University affirms these tenets as central to its view of education:

> God is the creator and sustainer of the universe.
>
> Mankind's fullest development entails a growing understanding of the individual in relation to both God and society.
>
> The quest for truth and professional expertise, in an environment permeated by religious values, benefits the individual and society and advances the ministry of the Seventh-day Adventist church.

MISSION

Loma Linda University's fundamental purpose as an institution of higher education is to provide — through the faculty, staff, administration, and curricula — an environment for learning that emphasizes individual commitment to Christ, personal integrity, intellectual development, and generous service to mankind and the church.

Particular attention is given to selecting curricula that educate students for Christian service. Whether or not the discipline is directly expressed

in denominational employment, the educational philosophy and methodology are molded by Seventh-day Adventist concerns and values.

The University's College of Arts and Sciences provides a significant liberal arts foundation intended to broaden and enrich the student, whatever the career choice. Professional and postbaccalaureate programs concentrate University resources in religion, business and management, education, social services, health and biomedical sciences, and other fields having a history of high priority among Seventh-day Adventists.

Although many Seventh-day Adventist students at Loma Linda University come from the western United States and most from North America, the University recognizes the larger constituency of the Adventist church throughout the world. Other students who esteem the Christian values of the University provide an additional constituency.

Because Loma Linda University is part of a system of Seventh-day Adventist institutions of higher education, it often serves these institutions through professional collaboration as well as academic agreements. Moreover, the University responds continually to the church's needs for skilled professionals, scholars, and administrators.

Loma Linda University's commitment to excellence in teaching is undergirded by scholarly activity, with growing emphasis on research in areas consistent with its educational goals. The University also provides extensive continuing professional education both locally and on distant campuses in North America and abroad.

In expressing its mission the University

> retains the practices of weekly chapel services on both campuses and required study in religion for all students because these activities not only develop and reinforce Christian community, but also add richness and balance to the academic, spiritual, and social life of the student. Furthermore, the University expects its citizens to live in harmony with the Seventh-day Adventist lifestyle.
>
> under the direction of the Board of Trustees, embraces the concept of shared participation in governance among administration, faculty, and students as the process by which decisions are made, implemented, and evaluated.

fosters the ideal of academic freedom, seeking to protect the faculty member from pressures both internal and external which would hinder the pursuit of knowledge and truth. At the same time it assumes that faculty members will act responsibly within the context of the philosophy and mission of the University.

affirms and practices nondiscrimination with regard to age, color, gender, ethnic origin, or handicap. It does, however, offer Adventist students preference in admission; and faculty and staff are recruited with specific attention to their membership in the Seventh-day Adventist church.

Loma Linda University readily accepts its role as a resourceful contributor to its constituencies, higher education, and the local community.

ADOPTED BY THE BOARD OF TRUSTEES
August 26, 1985

1988 CALENDAR

June

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

July

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

August

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

September

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

SUMMER QUARTER 1988

Master's degree students initiate a Petition for Admission to Candidacy (Form A) in the quarter after beginning study in the Graduate School

MAY 30-JUNE 17 Early registration LL

20 Registration (both campuses)

21 Instruction begins LL

4 Independence Day recess

15 Last day to petition doctoral candidacy (Form A) for winter completion

11 Last day to submit final copy of thesis, publishable paper, or dissertation, including signed approvals, and Certification of Requirements for Degree (Form D) to the Graduate School for summer completion

12 Last day to submit Petition for Admission to Candidacy (Form A) if this is the student's third quarter of study in a master's degree program

1 *Summer Commencement*

POSTSUMMER SESSION

1 Instruction begins

5 Labor Day recess

23 Instruction ends

FALL QUARTER 1988

Master's degree students initiate a Petition for Admission to Candidacy (Form A) in the third quarter after beginning study in the Graduate School

19-23 Early registration LL (returning students)

26 Registration (both campuses)

27 Instruction begins (both campuses)

1988 CALENDAR

October

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

4	Last day to enter a course
10	Last day to submit Petition for Graduation (Form C) for fall completion
11	Last day to withdraw with no transcript record
17-22	Week of Devotion (both campuses)

November

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

15	Last day to petition doctoral candidacy (Form A) for spring completion
23-27	Thanksgiving recess
28	Instruction resumes
28	Last day to withdraw with a W grade or to submit S/U petition

December

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

5-28	Early registration LL
8	Last day to submit final copy of thesis, publishable paper, or dissertation, including signed approvals, and Certification of Requirements for Degree (Form D) to the Graduate School for fall completion
9	Last day to submit Petition for Admission to Candidacy (Form A) if this is the student's third quarter of study in a master's degree program
12-15	Final examinations
15	Last day to submit Petition for Graduation (Form C) for winter completion
16	Christmas recess begins

1989 CALENDAR

January

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

WINTER QUARTER 1989

Master's degree students initiate a Petition for Admission to Candidacy (Form A) in the third quarter after beginning study in the Graduate School

3 Registration (both campuses)

3/4 Instruction begins

10 Last day to enter a course

14-21 Mission Emphasis Week (both campuses)

16 Martin Luther King, Jr., Day recess

17 Last day to petition doctoral candidacy (Form A) for summer completion

17 Last day to withdraw with no transcript record

February

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

6-12 Black Emphasis Week

20 Presidents' Day recess

27 Last day to withdraw with a W grade or to submit S/U petition

March

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

2 Last day to submit final copy of thesis, publishable paper, or dissertation, including signed approvals, and Certification of Completion of Requirements for Degree (Form D) to the Graduate School for winter completion

3 Last day to submit Petition for Admission to Candidacy (Form A) if this is the student's third quarter of study in a master's degree program

6-24 Early registration LL

13-16 Final examinations

16 Last day to submit Petition for Graduation (Form C) for spring completion

17-26 Spring recess

SPRING QUARTER 1989

Master's degree students initiate a Petition for Admission to Candidacy (Form A) in the third quarter after beginning study in the Graduate School

27 Registration

27/28 Instruction begins

1989 CALENDAR

April

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

3	Last day to enter a course
10	Last day to withdraw with no transcript record
14-16	Graduate School retreat
17	Last day to petition doctoral candidacy (Form A) for fall completion
17-22	Week of Devotion (both campuses)
26-30	Fine Arts Festival

May

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

4	Last day to submit final copy of thesis, publishable paper, or dissertation, including signed approvals, and Certification of Completion of Requirements for Degree (Form D) to the Graduate School for spring completion
5	Last day to submit Petition for Admission to Candidacy (Form A) if this is the student's third quarter of study in a master's degree program
15	Last day to submit Petition for Graduation (Form C) for summer completion
22	Last day to withdraw with a W grade or to submit S/U petition
29	Memorial Day recess

June

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

5-8	Final examinations
8	*Spring Commencement*
	SUMMER QUARTER 1989
	Master's degree students initiate a Petition for Admission to Candidacy (Form A) in the third quarter after beginning study in the Graduate School
19	Registration (both campuses)
20	Instruction begins

1989 CALENDAR

July

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

4	Independence Day recess
17	Last day to petition doctoral candidacy (Form A) for winter completion

August

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

10	Last day to submit final copy of thesis, publishable paper, or dissertation, including signed approvals, and Certification of Completion of Requirements for Degree (Form D) to the Graduate School for summer completion
11	Last day to submit Petition for Admission to Candidacy (Form A) if this is the student's third quarter of study in a master's degree program
31	*Summer Commencement*
	POSTSUMMER SESSION
31	Instruction begins

September

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

4	Labor Day recess
22	Instruction ends
	FALL QUARTER
	Master's degree students initiate a Petition for Admission to Candidacy (Form A) in the third quarter after beginning study in the Graduate School
18-22	Early registration LL (returning students)
25	Registration (both campuses)
26	Instruction begins (both campuses)

October

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

3	Last day to enter a course
9	Last day to submit Petition for Graduation (Form C) for fall completion
10	Last day to withdraw with no transcript record
9-14	Week of Devotion (both campuses)

1989

CALENDAR

November

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

15	Last day to petition doctoral degree candidacy (Form A) for spring completion
22-26	Thanksgiving recess
27	Instruction resumes
27	Last day to withdraw with a W grade or to submit S/U petition

December

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

4-29	Early registration LL
7	Last day to submit final copy of thesis, publishable paper, or dissertation, including signed approvals, and Certification of Requirements for Degree (Form D) to the Graduate School for fall completion
8	Last day to submit Petition for Admission to Candidacy (Form A) if this is the student's third quarter of study in a master's degree program
11-14	Final examinations
14	Last day to submit Petition for Graduation (Form C) for winter completion
15	Christmas recess begins

1990

January

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

WINTER QUARTER 1990

	Master's degree students initiate a Petition for Admission to Candidacy (Form A) in the third quarter after beginning study in the Graduate School
3	Registration (both campuses)
3/4	Instruction begins
10	Last day to enter a course
13-20	Mission Emphasis Week (both campuses)
15	Martin Luther King, Jr , Day recess
16	Last day to petition doctoral candidacy (Form A) for summer completion
17	Last day to withdraw with no transcript record

1990 CALENDAR

February

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

5-11	Black Emphasis Week
19	Presidents' Day recess
26	Last day to withdraw with a W grade or to submit S/U petition

March

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

1	Last day to submit final copy of thesis, publishable paper, or dissertation, including signed approvals, and Certification of Completion of Requirements for Degree (Form D) to the Graduate School for winter completion
2	Last day to submit Petition for Admission to Candidacy (Form A) if this is the student's third quarter of study in a master's degree program
5-23	Early registration LL
12-15	Final examinations
16	Last day to submit Petition for Graduation (Form C) for spring completion
16-25	Spring recess
	SPRING QUARTER 1990
	Master's degree students initiate a Petition for Admission to Candidacy (Form A) in the third quarter after beginning study in the Graduate School
26	Registration
26/27	Instruction begins

April

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

2	Last day to enter a course
6-8	Graduate School Retreat
9	Last day to withdraw with no transcript record
13-15	Graduate School retreat
16	Last day to petition doctoral candidacy Form A) for fall completion
16-21	Week of Devotion (both campuses)
25-29	Fine Arts Festival

1990 CALENDAR

May

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

3	Last day to submit final copy of thesis, publishable paper, or dissertation, including signed approvals, and Certification of Completion of Requirements for Degree (Form D) to the Graduate School for spring completion
4	Last day to submit Petition for Admission to Candidacy (Form A) if this is the student's third quarter of study in a master's degree program
16	Last day to submit Petition for Graduation (Form C) for summer completion
21	Last day to withdraw with a W grade or to submit S/U petition
28	Memorial Day recess

June

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

4-7	Final examinations
7	*Spring Commencement*
	SUMMER QUARTER 1990
	Master's degree students initiate a Petition for Admission to Candidacy (Form A) in the third quarter after beginning study in the Graduate School
18	Registration (both campuses)
18	Instruction begins

July

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

4	Independence Day recess
16	Last day to petition doctoral candidacy (Form A) for winter completion

1990 CALENDAR

August

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

9	Last day to submit final copy of thesis, publishable paper, or dissertation, including signed approvals, and Certification of Completion of Requirements for Degree (Form D) to the Graduate School for summer completion
10	Last day to submit Petition for Admission to Candidacy (Form A) if this is the student's third quarter of study in a master's degree program
30	*Summer Commencement*

September

S	M	T	W	T	F	S
						1
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9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

3	Labor Day recess
	POSTSUMMER SESSION
4	Instruction begins
21	Instruction ends
	FALL QUARTER
	Master's degree students initiate a Petition for Admission to Candidacy (Form A) in the third quarter after beginning study in the Graduate School
17-21	Early registration LL (returning students)
24	Registration (both campuses)
25	Instruction begins (both campuses)

October

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

2	Last day to enter a course
8	Last day to submit Petition for Graduation (Form C) for fall completion
9	Last day to withdraw with no transcript record
8-13	Week of Devotion (both campuses)

November

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

15	Last day to petition doctoral degree candidacy (Form A) for spring completion
21-25	Thanksgiving recess
26	Instruction resumes
26	Last day to withdraw with a W grade or to submit S/U petition

CALENDAR

1990

December

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

3-26	Early registration LL
6	Last day to submit final copy of thesis, publishable paper, or dissertation, including signed approvals, and Certification of Requirements for Degree (Form D) to the Graduate School for fall completion
7	Last day to submit Petition for Admission to Candidacy (Form A) if this is the student's third quarter of study in a master's degree program
10-13	Final examinations
13	Last day to submit Petition for Graduation (Form C) for winter completion
13	Christmas recess begins

1991

January

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

WINTER QUARTER 1991

Master's degree students initiate a Petition for Admission to Candidacy (Form A) in the third quarter after beginning study in the Graduate School

2	Registration (both campuses)
3	Instruction begins
14	Martin Luther King, Jr., Day recess
15	Last day to petition doctoral candidacy (Form A) for summer completion
	Mission Emphasis Week (both campuses)
15	Last day to enter a course, change status, or

February

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

4-10	Black Emphasis Week
18	Presidents' Day recess
25	Last day to withdraw with a W grade or to submit S/U petition
28	Last day to submit final copy of thesis, publishable paper, or dissertation, including signed approvals, and Certification of Completion of Requirements for Degree (Form D) to the Graduate School for winter completion

1991 CALENDAR

March

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

1	Last day to submit Petition for Admission to Candidacy (Form A) if this is the student's third quarter of study in a master's degree program
4-22	Early registration LL
11-14	Final examinations
15	Last day to submit Petition for Graduation (Form C) for spring completion
15-24	Spring recess
	SPRING QUARTER 1991
	Master's degree students initiate a Petition for Admission to Candidacy (Form A) in the third quarter after beginning study in the Graduate School
25	Registration
26	Instruction begins

April

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

	Graduate School retreat (to be announced)
1	Last day to enter a course
8	Last day to withdraw with no transcript record
15	Last day to petition doctoral candidacy (Form A) for fall completion
15-20	Week of Devotion (both campuses)
20-29	Fine Arts Festival

May

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

2	Last day to submit final copy of thesis, publishable paper, or dissertation, including signed approvals, and Certification of Completion of Requirements for Degree Form D) to the Graduate School for spring completion
3	Last day to Petition for Admission to Candidacy (Form A) if this is the student's third quarter of study in a master's degree program
3-5	Graduate School Retreat
15	Last day to submit Petition for Graduation (Form C) for summer completion
20	last day to withdraw with a W grade or to submit S/U petition
27	Memorial Day recess

1991 CALENDAR

June

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

3-6	Final examinations
6	*Spring Commencement*
	SUMMER QUARTER 1991
	Master's degree students initiate a Petition for Admission to Candidacy (Form A) in the third quarter after beginning study in the Graduate School
17	Registration (both campuses)
17	Instruction begins

July

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

4	Independence Day recess
15	Last day to petition doctoral candidacy (Form A) for winter completion

August

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

8	Last day to submit final copy of thesis, publishable paper, or dissertation, including signed approvals, and Certification of Completion of Requirements for Degree (Form D) to the Graduate School for spring completion
9	Last day to submit Petition for Admission to Candidacy (Form A) if this is the student's third quarter of study in a master's degree program
29	*Summer Commencement*


GRIGGS HALL

I

Admission Information
Financial Information
Programs and Degrees
Academic Practices

In the Graduate School of Loma Linda University the essential concern of both faculty and students is the quest for meaning. Because that quest is served by knowledge, graduate students are obliged to achieve both broad and detailed mastery of their field of study, and also to participate with the faculty in the process by which knowledge is augmented.

Objectives The Graduate School attempts to create an environment favorable to the pursuit of knowledge and meaning by:

1. Making available to graduate students who wish to study in a Seventh-day Adventist Christian setting the education necessary for scholarly careers in the arts and sciences and in the health professions.
2. Encouraging the development of independent judgment and mastery of the techniques of research and the arts of expression.
3. Relating intellectual achievement to the service of mankind.

ADMISSION INFORMATION

The program admissions committees of the University intend that an applicant to any of the schools is qualified for the proposed curriculum and is capable of profiting from the educational experience in this University. The admissions committees of the Graduate School accomplish this by examining evidence of scholastic competence, moral and ethical standards, and significant qualities of character and personality. Applicants are considered for admission only on the recommendation of the program in which study is desired.

APPLICATION AND ACCEPTANCE

Where to write Inquiries regarding application and admission should be addressed to:

Office of Admissions, Graduate School
Loma Linda University
Loma Linda, California 92350

Application procedure 1. Two copies of the graduate application should be filled out and mailed, together with the application fee, to the above address. Applications and all supporting information — transcripts, test results, references — should be submitted at least two months before the beginning of the term for which admission is sought.

2. Two complete official transcripts of all academic records from colleges, universities, and professional or technical schools should be provided. It is the applicant's responsibility to arrange to have the transcripts sent directly by the registrar of each school attended to the Office of Admissions Graduate School.

3. A personal interview is often desirable and should be arranged with the chairman of the department in which the student wishes to work.

Acceptance procedure 1. When the program in which the student wishes to study has evaluated the application and made its recommendation, the dean of the Graduate School takes official action and notifies the applicant. The formal notice of admission should be presented at registration as evidence of eligibility to enter in the Graduate School.

2. Students accepted may be asked to file a medical history with Student Health Service as part of registration.

3. Transcripts of records and all other application documents are retained permanently by the University for students who enroll, and may not be withdrawn and used by students for any purpose. Records of students who do not enroll are destroyed two years from the date of arrival in the Graduate School.

ADMISSION REQUIREMENTS

A baccalaureate degree (or its equivalent) from an accredited college or university is a prerequisite for admission to the Graduate School. Transcripts of the applicant's scholastic record should show appropriate preparation, in grades and content, for the curriculum chosen. Since there is some variation in the pattern of undergraduate courses prescribed by different programs, the student should note the specific requirements of the chosen program.

Scholarship Applicants are expected to present an undergraduate record with a grade point average of B (3.00) or better in the overall program and in the field of the major. Some students with an overall grade point average between 2.50 and 3.00 may be admitted provisionally to graduate standing, provided the grades of the junior and senior years are superior.

Graduate Record Examinations Scores on the general test of the Graduate Record Examination (GRE) are required with applications for admission. Students may address inquiries about these examinations to Office of Admissions Graduate School, which can provide application forms and information about special administration of the examination on days other than Saturday.

Application forms for the GRE and information as to examination times and places are furnished by Educational Testing Service, 1947 Center Street, Berkeley, California 94701 (for the West); and Princeton, New Jersey 08540 (for the East).

When pressure of time makes it impossible to secure the GRE results, students seeking admission who have otherwise above average achievement may be admitted provisionally, subject to review when the required test results are received. In such cases, test results are to be submitted within the first quarter of attendance.

Veterans A student who is eligible to have veteran's benefits should transfer records to the Veterans Administration Regional office, 11000 Wilshire Boulevard, Los Angeles, California 90024. Veterans must be admitted to a degree program to be eligible to receive benefits. Further information may be requested from the Office of University Records. For advance payments, the student must contact the Office of University Records at least forty-five days prior to enrollment.

Reentrance A student who discontinues studies at the University must meet the entrance requirements effective at the time of reentrance, unless a leave of absence has been granted. Fees are required for reentrance applications, and supplementary documents may also be required.

International students The admission of students from countries where English is not the first language is limited to those who meet all requirements for admission; submit official English translations of their transcripts; furnish suitable recommendations from responsible persons; pass the Test of English as a Foreign Language (TOEFL) or the Michigan Test of English Language Proficiency (MTELP); and give evidence of ability to meet all financial obligations to the University during the course of study.

Inquiry about the time and place of administration of the tests should be addressed to Educational Testing Service at the addresses noted under the paragraph "Examinations."

Scholarships and assistantships for first-year graduate students from abroad are extremely limited; consequently applicants should assume that they will need to have financial resources sufficient for a full year's study. A deposit must be made to the International Student Affairs Office before immigration documents are furnished.

Exchange visitor The University program for exchange visitors, through the United States Department of State, may be advantageous for international students. A person entering the United States on an exchange visitor visa (J-1) is subject to the same regulations on study load and work as is the F-1 student. Further information may be obtained from the University Student Affairs Office.

Visa forms Forms for both the F-1 and the J-1 visas are issued by the adviser in the International Student Affairs Office after acceptance and after financial arrangements have been made with that office.

Student visa A graduate student entering the United States on a student visa (F-1) must successfully carry a study load of at least eight units during each quarter of the academic year. The applicant must be prepared to provide such advance deposit as is required by Student Finance and must give assurance that additional funds will be forthcoming to meet

school expenses. Fellowships and assistantships for international students are limited, and employment is limited by regulations of the Immigration and Naturalization Service to no more than twenty hours per week.

English competence All international students are encouraged (and those who do not have a sufficient score on TOEFL or MTELP or other evidence of English proficiency are required) to attend the Intensive American Language Institute offered during the five weeks before the beginning of the fall quarter. Further information can be obtained from the University's Student Affairs Office. Further study of English may be required to assure progress toward the degree.

ADMISSION CLASSIFICATIONS

Applicants are admitted to one of the following classifications. For regular and provisional status, applicants must be approved for acceptance by the program in which they propose to study. Others may be accepted, subject to availability of facilities, and classified as nondegree students.

Regular Regular status is given to a student who meets the scholarship and examinations requirements for admission to the graduate program of choice, has met all prerequisites, and who has no undergraduate deficiencies.

Provisional Provisional status is given to a student (*a*) whose scholarship does not reach the level for regular graduate standing but who shows strong promise of success in graduate studies, or (*b*) who has the prerequisites but whose undergraduate preparation is inadequate for the chosen graduate program, or (*c*) whose admissions documentation is incomplete at the time of notification of acceptance. To continue eligibility for graduate study, a student admitted on provisional status must achieve a grade point average of 3.00 quarter by quarter.

Nondegree Nondegree status is given to a student who wishes to enroll in graduate courses for personal or professional benefit but who is not seeking a graduate degree. Such applicants complete a specially designed application form.

Nondegree students in the Graduate School are permitted only 12 units of study for regular grades. Beyond the 12 units, only audit (AU) may be recorded.

Certificate Students seeking admission to one of the Graduate School's postbaccalaureate or postdoctoral certificate programs apply in the usual way for regular or provisional admission but are classified as *certificate* students.

Auditor A student in any classification may register for a course as *auditor* with the consent of the adviser and the instructor of the course. The student pays tuition and attends at least 80 percent of course lectures.

College senior A senior with a grade point average of 3.0 or above may request to take a graduate course simultaneously with courses that complete bachelor's degree requirements if the total does not constitute more than 12 academic units. Registration requires instructor and Graduate School dean approval.

FROM MASTER'S TO PH.D. DEGREE

Bypassing master's A graduate student at this University often proceeds first to a master's degree. If at the time of application the student wishes to qualify for the Doctor of Philosophy degree, this intention should be declared even if the first objective is a master's degree.

If after admission to the master's degree program a student decides to go on to the doctoral degree, written application should be made to the adviser and the dean of the Graduate School. If the award of the master's degree is sought, the student will be expected to complete that degree before embarking on doctoral activity for credit. A student who desires to bypass the master's degree may do so on recommendation of the guidance committee and with the consent of the dean, on these grounds: courses and research have been completed in the appropriate field equivalent in quality and scope to the master's degree requirements, a substantial part of the credits being from this University.

Second master's A student who wishes to qualify for an additional master's degree in a different discipline may apply. The dean of the Graduate School and the faculty of the program the student wishes to enter will consider such a request on its individual merits.

Concurrent admission Students may not be admitted to a Graduate School program while admitted to another program at this University or elsewhere. The exceptions to this are the combined degrees, discussed in the following paragraph.

Combined degrees The Graduate School provides for concurrent registration for two degrees only in its combined science/professional degree programs — M.D./Ph.D., M.D./M.S., D.D.S./Ph.D., and D.D.S./M.S. — all in biomedical sciences. Concurrent application is required in some but not all of these. See page 42 of this BULLETIN; see also "Becoming a Medical Scientist at Loma Linda University," a brochure obtained from the dean's office.

STUDENT LIFE

On admission each student receives a copy of *Image and Influence* and the student handbook appropriate to the campus on which her/his program is located. These publications are the main sources of written guidance to student life at Loma Linda University.

FINANCIAL INFORMATION

GENERAL PRACTICES

The student is expected to arrange for financial resources to cover all expenses before the beginning of each school year. Accounts with other schools or this University must have been settled.

Advance payment *Tuition and fees are charged and payable in full in advance of each term.* If the student withdraws from a course or courses during the first two weeks of the quarter, all tuition is refundable. If withdrawal occurs after the second week, but before the midpoint of the quarter, one fourth of the tuition charged is refundable. Tuition is not refundable if withdrawal occurs after the midpoint of the term.

Monthly statement The amount of the monthly statement is due and payable in full within thirty days after presentation. A student unable to meet this requirement must make proper arrangements with Student Finance. An account that is more than thirty days past due is subject to a service charge of .833 percent per month (10 percent per year). Failure to pay scheduled charges or to make proper arrangements, which is reported to the Office of University Records and the Graduate School dean, may be cause for the student to be considered absent, discontinued, or ineligible to take final examinations.

Financial clearance The student is expected to keep a clear financial status at all times. Financial clearance must be obtained before registration each term; before receiving a certificate or diploma; or before requesting a transcript, statement of completion, or other certification to be issued to any person, organization, or professional board.

Checks Checks should be made payable to Loma Linda University and should *show the student's ID number* to ensure that the correct account is credited.

Veterans A student who is eligible to have veteran's benefits under the 1966 enactment should transfer records to the Veterans Administration Regional Office, 11000 Wilshire Boulevard, Los Angeles, California 90024. Veterans must be admitted to a degree program to be eligible to receive benefits. Application should be made well in advance of enrollment. Further information may be requested from the Office of University Records. To receive advance payments, the student must contact the Office of University Records at least forty-five days in advance of enrollment.

Student health reimbursement plan The Student Reimbursement Plan complements the University Health Service Plan by reimbursing students referred by Health Service for expenses of costly illness and injuries in excess

of any benefits to which students may be entitled under any medical protection or personal insurance policy, or membership in any hospital association.

All Loma Linda University students for whom full graduate or undergraduate tuition is being received or who are enrolled for seven units or more per quarter are automatically covered by both the Student Health Service and the Student Reimbursement Plans. "In progress" units do not count toward the seven-unit minimum, since tuition for in progress units was paid in a previous quarter. Students enrolled for fewer than seven units per quarter but who desire coverage should contact the Department of Risk Management. No coverage will apply until financial arrangements have been completed.

All students may secure family coverage for both plans. Eligible dependents are the spouse (residing with the insured student) and unmarried children over fourteen days old and under nineteen years of age, who are not self-supporting and reside with the student.

Coverage will become effective on the date of registration or three days prior to registration if the student is on campus. Dependents' coverage will be effective from the date the application and premium are received by the Department of Risk Management.

For further information, contact the Department of Risk Management, Convenience Center.

SCHEDULE OF CHARGES

TUITION, GRADUATE SCHOOL PROGRAMS IN GENERAL

Graduate students pay per unit. Package rates apply only for the Marriage and Family Therapy program in the College of Arts and Sciences, and the School of Dentistry. For 1988-89, these rates are:

College of Arts and Sciences: $204 per unit; $2,450 for 12-16 units, MFAM ONLY.
School of Allied Health Professions: $204 per unit.
School of Medicine: $204 per unit.
School of Nursing: $204 per unit.
School of Public Health: $190 per unit.
School of Religion: $204 per unit.

TUITION, GRADUATE DENTISTRY PROGRAM

$15,470	Total for 22-month certificate program;
2,210	Per quarter, effective autumn quarter 1988.
17,680	Total for 24-month certificate/degree program;
2,210	Per quarter, effective autumn quarter 1988.
15,960	Total for 36-month Oral and Maxillofacial Surgery Program;
1,330	Per quarter, effective autumn quarter 1988.

SPECIAL CHARGES

$30 Application fee.
30 Continuous registration fee for each quarter in which no tuition is paid.

Students should plan on an annual increase consistent with inflation.

FINANCIAL AID

University fellowships Fellowships are awarded annually to students of outstanding promise and performance. University fellowships carry stipends and remission of tuition.

Assistantships A limited number of teaching and research assistantships, with stipends, are provided by individual programs.

Tuition waiver Program chairmen and coordinators recommend partial- or full-tuition waivers for students of demonstrated achievement.

Application An application for a fellowship or an assistantship from a student not already enrolled in a graduate program at the University must be accompanied by an application for admission. All applications for financial aid must have a completed Financial Aid Form, which is available from Student Financial Aid on either campus.

Closing date An application for financial aid of any kind should be made as early as possible but preferably no later than six weeks before the beginning of the effective quarter. Budgets are established in the spring for the following fall.

Loans Financial assistance is available to the student from University loan funds, government loan funds, and other special trust funds. Inquiries concerning loans and other student financial matters should be made to the Office of Student Financial Aid.

SATISFACTORY PROGRESS

Each degree program has defined "satisfactory progress" as it relates to financial aid. Years in the program and requirements completed are specified. Students should consult their advisers to get copies of the policy.

PROGRAMS and DEGREES

The Graduate School offers programs leading to the degrees Master of Science, Master of Arts, and Doctor of Philosophy as listed below. The campus on which registration is conducted is indicated by the designation LS (La Sierra), LL (Loma Linda), AC (Avondale College) or CUC (Canadian Union College).

Master of Science

Anatomy LL
Biochemistry LL
Marriage and Family Therapy LL / CUC
Microbiology LL
Nursing LL
Nutrition LL
Paleontology LS
Pharmacology LL
Physical Education and Health LS
Physiology LL
Speech-Language Pathology LS
Dentistry LL:
- Endodontics
- Oral and Maxillofacial Surgery
- Orthodontics
- Periodontics

Master of Arts

Biology LS
English LS
Family Life Education LL / AC
History LS
Religion LL

Doctor of Philosophy

Anatomy LL
Biochemistry LL
Biology LS
Medical Scientist Program LL
Microbiology LL
Pharmacology LL
Physiology LL

Other graduate programs Other graduate degrees are offered in the University by the School of Allied Health Professions (Master of Physical Therapy), the School of Business and Management (Master of Business Administration), the School of Public Health (Master of Science in Public Health, Master of Public Health, Master of Health Administration, Doctor of Health Science, and Doctor of Public Health), the School of Education (Master of Arts, Specialist in Education, and Doctor of Education).

Teacher preparation Students planning to qualify for teaching credentials should consult the credentials adviser in the School of Education, La Sierra campus, and their Graduate School adviser.

Adviser and guidance committee Each student accepted into a degree program is assigned an adviser who helps to arrange the program of studies to meet University requirements; subsequently (no later than when applying for candidacy) the student is put under the supervision of a guidance committee. This committee is responsible to and works with the coordinator of the student's program in arranging courses, screening thesis topics (where applicable), guiding research, administering final written and/or oral examinations, evaluating the thesis and other evidence of the candidate's fitness to receive the degree, and recommending the student for graduation.

Subject prerequisites and deficiencies Gaps in an applicant's academic achievement will be identified by subject and classified either as prerequisites or as subject deficiencies. Applicants lacking certain subject or program prerequisites are not admitted to the master's degree program until the prerequisites are completed (at Loma Linda University or elsewhere), and acceptable grades are reported. However, subject deficiencies do not exclude an applicant from admission or enrollment, but they must be removed as specified by the adviser or dean, usually at the beginning of the graduate experience at this University.

Study plan The student's adviser develops with the student a written outline of the complete graduate experience, with time and activity specified as fully as possible. This serves as a guide to both the student and the adviser as well as to members of the guidance committee when it is selected. The study plan is changed only after careful consultation.

Time limit The time allowed from admission to the Graduate School to conferring of the master's degree may not exceed five years. Some consideration may be given to a short extension of time if in the dean's opinion such is merited.

Residence Students must meet residence requirements indicated for particular degrees (never less than one academic quarter). The master's degree candidate must complete one quarter of full-time study at the University or perform the thesis research at the University. Although twelve units each quarter are ordinarily considered a full graduate study load, a student is considered in full-time residence if registered for at least eight units.

Grade achievement The required minimum grade average is B (3.00) with no course grade below C (2.0) on all work for the master's degree. This average must be maintained in formal courses and in research, computed separately. A student submitting transfer credits must earn a B grade average on all work taken at this University.

Research competence Student skills in languages, investigation, and computation are specified in each program description in this BULLETIN.

Comprehensive and final examinations The student must take the written and oral examinations prescribed by the program on or before the published dates. Examinations for the master's degree candidate include a final examination not later than a month before the date of program completion.

If a candidate fails to pass the final oral or written examination for a graduate degree, the examining committee files with the dean a written analysis of the candidate's status, with recommendations regarding the student's future relation to the School.

Thesis Students writing a thesis must register for at least one unit of thesis credit.

The research and thesis preparation are under the direction of the student's guidance committee. The student is urged to secure the committee's approval of the topic and research design as early as possible. Such approval must be secured before petition is made for candidacy.

The student must register and pay tuition for thesis credit whether the work is done in residence or in absentia. If the student has been advanced to candidacy, has completed all course requirements, and has registered for but not completed the research and thesis, continuous registration is to be maintained until the manuscript has been accepted. This involves a quarterly fee of $30 (1988-89) paid at the beginning of each quarter.

Candidacy Admission to the Graduate School or designation of regular graduate standing does not constitute admission of the student to candidacy for a graduate degree. After achieving regular status, admission to candidacy is initiated by a written petition from the student to the dean, on recommendation of the program coordinator and department chairman.

Petition for candidacy for the master's degree must present a satisfactory grade record; include a statement of the proposed thesis or dissertation topic (where applicable) that has been approved by the student's guidance

committee; and note any other qualification prescribed by the program. A student is usually advanced to candidacy during the third quarter after entry upon study toward a degree in the Graduate School.

Specific program requirements In addition to the foregoing, the student is subject to the requirements stated in the section of the BULLETIN governing the specific program chosen.

Combined degree programs: M.D./M.S. and D.D.S./M.S. Two combined degree programs are offered, each intended to provide preparation in clinical applications and the biomedical sciences. Both require concurrent admission to the Graduate School and a professional school in the University. These curricula are described in greater detail on page 42 of this BULLETIN.

Religion requirement All master's degree students are required to take at least one religion course. Courses (numbered between 500 and 600) in social ethics, bioethics, and philosophy of religion meet this requirement.

THE DOCTOR OF PHILOSOPHY DEGREE

The Doctor of Philosophy degree is awarded for evidence of mature scholarship; productive promise; and active awareness of the history, resources, and demands of a specialized field.

Adviser and guidance committee Each student on acceptance into a degree program is given an adviser who helps arrange the study program. Subsequently (no later than when applying for candidacy) the student is put under the supervision of a guidance committee. This committee, usually chaired by the adviser, is responsible to and works with the coordinator of the student's program in arranging course sequences, screening dissertation topics, recommending candidacy, guiding research, administering written and oral examinations, evaluating the dissertation and other evidence of the candidate's fitness to receive the degree, and recommending the student for graduation.

Subject prerequisites and deficiencies Gaps in an applicant's academic achievement will be identified by subjects and classified as either prerequisites or as subject deficiencies.

Applicants lacking subject or program prerequisites are not admitted to the Ph.D. program until the prerequisites are completed (at Loma Linda University or elsewhere) with acceptable grades.

Subject deficiencies do not exclude an applicant from admission or enrollment, but they must be removed as specified by the adviser or dean, usually at the beginning of the graduate experience at this University.

Study plan The student's adviser develops with the student a written outline of the complete graduate experience, with time and activity specified as fully as possible. This serves as a guide to both the student and the advisers as well as to members of the guidance committee when it is selected. The study plan is changed only after careful consultation.

Time limit Completion of the graduate experience signals currency and competence in the discipline. The dynamic nature of the biological sciences makes dilatory or even leisurely pursuit of the degree unacceptable. Seven years are allowed for completion after admission to the Ph.D. program. Extension of time may be granted on petition if recommended by the guidance committee to the dean of the Graduate School.

Course credit allowed toward the doctorate is nullified eight years from the date of course completion. Nullified courses may be revalidated, upon successful petition, through reading, conference, written reports, and always an examination to assure currency in the content.

Residence The Graduate School requires two years of residency for the Ph.D. degree, spent on a campus of the University after enrollment in a doctoral degree program. During residence, students devote full time to graduate activity in courses, research, or a combination of these. A full load of courses is 8 or more units each quarter; 36 or more clock hours per week is full time in research. Some graduate programs specify the number of academic units for the residence years.

Students may be advised to pursue studies for limited periods at special facilities not available at Loma Linda University. Such time may be considered residence if the arrangement is approved in advance by the dean of the Graduate School.

The spirit and demands of doctoral study require full-time devotion to courses, research, reading, and reflection. But neither the passage of time nor preoccupation with study assures success. Evidence of high scholarship and original contribution to the field form the basis for determining the awarding of the degree.

Grade achievement Students must maintain a grade point average of at least a B (3.00) to continue in regular standing toward the doctorate. This average is to be computed separately for courses and research. Courses in which a student earns a grade between C (2.0) and B (3.0) may or may not apply toward the degree, at the discretion of the guidance committee. A student submitting transfer credits must earn a B average for all registrations at this University.

Research competence Doctoral students demonstrate research competence by their investigative activities. Expectations and standards of achievement with the tools of investigation — natural and synthetic languages and computers — are specified for each program later in this BULLETIN.

Comprehensive examinations The doctoral candidate is required to take comprehensive written and oral examinations over the principal areas of study to ascertain capacity for independent, productive, scientific work, and to determine whether further courses are required before the final year of preparation for the doctorate is undertaken. The program coordinator is responsible for arranging preparation and administration of the examination, as well as its evaluation and subsequent reports of results. Success in the comprehensive examination is a prerequisite to candidacy (see p. 41).

Students cannot be admitted to the examination until the following requirements have been met: (*a*) demonstrated reading knowledge of one foreign language, where applicable; (*b*) completion of the majority of units required beyond the master's degree or its equivalent.

The final oral examination After completion of the dissertation and not later than a month before the date of graduation, the doctoral candidate is required to appear before an examining committee for the final oral examination.

If a candidate fails to pass this final examination for a graduate degree, the examining committee files with the dean a written analysis of the candidate's status, with recommendations about the student's future relation to the School. The student receives a copy of the committee's recommendation.

Dissertation All doctoral students must register for at least one unit of dissertation credit. This may be done in the last quarter of registration prior to completion.

The research and dissertation preparation are under the direction of the student's guidance committee. The student is urged to secure the committee's approval of the topic and research design as early as possible. Such approval must be secured before petition is made for advancement to candidacy.

Consultation with Graduate School Admissions and Records can preserve the student from embarrassing errors of format that require retyping large sections of manuscript.

Tuition covers the cost of binding the four copies, distributed among the University library, the appropriate department or school, and the guidance committee chairman. Personal copies are bound at the student's expense.

Students register and pay tuition for the dissertation whether the work is done in residence or in absentia. If the student has been advanced to candidacy, has completed all course requirements, and has registered for but not completed the research and dissertation, continuous registration is maintained until the manuscript is accepted. This involves a quarterly fee of $30 (1988-89) paid during registration each quarter.

Doctoral dissertations are reported to University Microfilms International and to the National Research Council. The Graduate School office provides appropriate information and forms.

Candidacy Admission to the Graduate School or designation of the status regular graduate standing does not constitute candidacy for a graduate degree. Admission to candidacy is initiated by a written petition (Graduate School Form A) from the student to the dean, with intermediate recommendation of the student's adviser and the program chairman.

The student's petition for candidacy for the Doctor of Philosophy degree will include, in addition, confirmation that comprehensive written and oral examinations have been passed.

Students expecting the award of the doctorate at a June graduation should have achieved candidacy no later than the previous November 15.

Students expecting the award of the doctorate at a Summer Commencement should have achieved candidacy no later than the previous January 17. One full quarter must be allowed between the achievement of candidacy and the quarter of completion.

Specific program requirements Doctoral programs differ from each other. The unique program requirements appear in the program sections of this BULLETIN and in the program guides available from specific departments.

Combined degree programs: M.D./Ph.D. and D.D.S./Ph.D. Two combined degree programs are offered, each intended to provide preparation in clinical medicine and the biomedical sciences. Both require concurrent admission to the Graduate School and a professional school in the University. These curricula are described in greater detail in the section Combined Science/Professional Degrees.

Religion requirement All doctoral students take at least one religion course. Courses (numbered between 500 and 600) in social ethics, bioethics, and in philosophy of religion meet this requirement.

COMBINED BIOMEDICAL SCIENCE/PROFESSIONAL DEGREES

The Graduate School collaborates with the Schools of Medicine and Dentistry in offering two curricula that lead to the awarding of a professional degree — either the M.D. or D.D.S. — and either the M.S. or Ph.D. in a biomedical science. The biomedical sciences available are anatomy, biochemistry, microbiology, pharmacology, and physiology.

The two curricula differ in the point at which students enter the Graduate School and in the first year's sequence of courses. They are similar, however, in the general requirements for the degree, in requiring regular status at admission, and in requiring acceptance into both the Graduate School and one professional school.

Both curricula are fully described in a separate brochure, "Becoming a Medical Scientist at Loma Linda University," available from Admissions, the Graduate School, Loma Linda University, Loma Linda, CA 92350.

The two curricula are described in the following sections.

Biomedical Science Program (BSP) The Biomedical Science Program provides opportunity for especially well-qualified and motivated students to pursue professional and graduate education; and to prepare for careers in clinical specialization, teaching, or investigation of problems of health and disease in man.

For admission to the Biomedical Science Program, students must have a baccalaureate degree, must qualify for admission to the Graduate School, and must already be admitted to either the School of Medicine or Dentistry. Application may be made at any point in the student's progress in the professional school, though usually during the sophomore year. Students in this curriculum study toward a degree, either the M.S. or Ph.D., in one of the five biomedical science disciplines previously named.

Students interrupt their professional study for two, perhaps more years as needed, for courses and research for the graduate degree sought. Elective time in the professional school may be spent in meeting graduate requirements.

The student's concurrent status is regarded as continuous until the program is completed or until discontinuance is recommended by the Graduate School or the professional school. The usual degree requirements apply.

Medical Scientist Program (MSP) The Medical Scientist Program has similar degree and career objectives to the Biomedical Science Program, but with some differences.

Applicants are admitted who achieve simultaneous regular acceptance in the Graduate School and the School of Medicine prior to enrollment in either school. Study begins in the Graduate School with a one-year sequence in cell and molecular biology and clinically related seminars.

During the first years, the MSP coordinator advises the students. Later, when research interest and direction emerge, a program adviser and a thesis or dissertation guidance committee are chosen and recommend advancement to candidacy.

After the first MSP year, students pursue the first two somewhat modified years of their professional curriculum, returning to the Graduate School thereafter to complete and receive the graduate degree. Completion of the professional training follows. Elective time in the professional school may be spent in meeting graduate requirements.

ACADEMIC PRACTICES

REGISTRATION

The student must register on the dates designated in the University calendar in this BULLETIN. Registration procedure includes recording information on forms furnished by the Office of University Records and clearing financial arrangements with Student Finance. The course list filed must have been approved by the graduate adviser and the dean.

Late registration is permissible only when there is a compelling reason; a charge is made if registration is not completed on the designated dates. The student may not attend class without being registered, and in no case may registration take place later than the second week of a term. A change in registration after the second week affects the grade record. In the Graduate School a change in registration requires the recommendation of the student's major department chairman and the approval of the dean.

CONDITIONS OF REGISTRATION, RESIDENCE, ATTENDANCE

Academic residence A student must meet the residence requirements indicated for a particular degree, never less than one academic quarter. A year of residence is defined as three quarters of academic work. The master's degree candidate must complete one quarter of full-time study or perform the thesis research work at the University or an approved off-campus location. A student is in full-time residence if registered for at least 8 units. A maximum of 12 units may be taken without special petition.

Extramural study When a student begins a degree program, it is understood that courses taken must be conducted on a campus of the University unless, upon petition for extramural study, the student obtains consent from the department chairman and the dean. In such instances, the student must arrange with the chairman of the department for evaluation of the study and, at its completion, recommendation as to credit and grade.

Handbook The student is required to follow the procedures outlined in the *Handbook for Graduate Students,* which can be obtained on either campus from the Office of the Dean.

Leave of absence A student who wishes to withdraw for a quarter or longer submits a written request for leave of absence, indicating the reason and the length of time needed to be out of the program. One year is the

maximum leave time granted. This request requires the approval of the student's department and the dean. Stipulations for reentry are given the student in writing. During the period of leave, students maintain continuous registration by payment of a quarterly fee, currently $30 (1988-89).

Readmission A student who interrupts graduate study without arranging for a leave of absence is administratively withdrawn from the Graduate School. Resumption of work toward a graduate degree requires reapplication for admission and is subject to the requirements in effect at the time of readmission.

Continuous registration A student is required to maintain continuous registration from advancement to candidacy to the awarding of the degree. For quarters during which the student is not paying course tuition, a fee of $30 (1988-89) is charged.

Withdrawal Formal withdrawal must be arranged at Graduate School Admissions and at the Office of University Records.

Transfer credits A transfer student who has done acceptable graduate study in an approved institution may transfer credit up to 9 quarter units toward the master's degree, but may not transfer excess grade points to offset less than a B average at the University.

A candidate for the doctorate who holds a master's degree, or presents its equivalent by transcript, may receive credit up to 54 quarter units, subject to the consent of the dean and the department chairman involved. In such instances the transfer student is not relieved of residence requirements at this University.

Chapel Weekly devotional services are held as part of the regular program of the University; and full-time, enrolled students are expected to attend.

Grievance or dismissal Students who are involved in dismissal proceedings or who wish to express a grievance may obtain from the Office of the Dean a copy of guidelines governing dismissal or presenting a grievance.

Adviser and guidance committee Each student is assigned an adviser and a guidance committee. These are described fully under each degree description elsewhere in this BULLETIN.

Time limits Any credit transferred to the School or taken in residence and submitted toward a master's degree is nullified seven years from the date when the course was completed. Similarly, credit submitted toward a doctor's degree is nullified eight years from the date when the course was completed.

The time lapse from first enrollment in a graduate curriculum to the conferring of the master's degree may not exceed five years. For the doctor's

degree, seven years are allowed after the date of admission; however, students enrolled in an approved combined degree program may be permitted nine years. A student desiring reinstatement must reapply to the dean. This procedure implies a reevaluation of the student's total program.

Statistics and research consultation Several programs in the Graduate School require statistics, either as a prerequisite to entry, as part of the program, or both. The course STAT 509 General Statistics, described in the School of Public Health BULLETIN, fulfills the prerequisite requirement; other requirements are specified by program. The course STAT 698 Research Consultation, described in the School of Public Health BULLETIN, provides professional guidance as the individual student initiates and progresses with research projects, thesis, or dissertation.

GRADUATION ATTENDANCE

A candidate for a graduate degree is expected to attend the graduation events and to receive the diploma in person. Consent for the degree to be conferred in absentia is contingent on the recommendation of the dean to the president and can only be granted by the president.

SCHOLASTIC STANDING

The following values are assigned for calculation of the grade point average per unit of enrollment:

A	4.0	B	3.0	C	2.0	D	1.0
A—	3.7	B—	2.7	C—	1.7	F	0.0
B+	3.3	C+	2.3	D+	1.3		

The following designations are used to make clear the student's status but not to indicate credit:

AU	audit
I	incomplete
IP	in progress (for courses which cross term boundaries)
S	satisfactory (used in pass-fail courses; does not affect GPA)
U	unsatisfactory (does not affect GPA)
W	withdraw (given from two weeks after registration until two weeks before final examinations begin)

The graduate student is expected to maintain a consistently high level of performance. The dean receives reports on the quality of work done in order to determine the eligibility of the student for advancement.

PROGRAM PRACTICES

Degree programs specify expectations in this BULLETIN as well as in their own publications. Students should become well acquainted with both sources of guidance.

THESIS AND DISSERTATION

The student's research and thesis or dissertation preparation are under the direction of the student's guidance committee. The student is urged to secure the committee's approval of the topic and research design as early as is feasible. Such approval must be secured before petition is made for advancement to candidacy.

Handbook Instructions for the preparation and format of the publishable paper, thesis, or dissertation are in the *Handbook for Graduate Students,* available at the Graduate School Admissions Office. Consultation with Graduate School Admissions and Records can preserve the student from embarrassing errors of format that require retyping large sections of manuscript. The last day for submitting copies to the Graduate School office in final approved form is published in the calendar.

Binding Tuition covers the cost of binding copies of thesis or dissertation to be deposited in the University library and the appropriate department or school collection. Personal copies are bound at the student's expense.

BULLETIN

When this BULLETIN and any other Graduate School publication or publication of any other school or any other Graduate School program conflict, this BULLETIN prevails.

II

Anatomy
Biochemistry
Biology
Dentistry
English
Family Life Education
History
Marriage and Family Therapy
Medical Scientist Program
Microbiology
Nursing
Nutrition
Paleontology
Pharmacology
Physical Education and Health
Physiology
Religion
Speech-Language Pathology

At this point in the BULLETIN, the student should look in both directions before proceeding — look ahead to the specific area requirements of the chosen program, and look back to the general requirements applicable to all programs in the Graduate School.

COURSE LISTINGS

Numbering Courses numbered from 301 to 499 are advanced undergraduate courses. Those from 501 to 599 are graduate courses; and from 601 to 699, graduate seminar, research, and thesis or dissertation courses.

Graduate credit Certain courses at the advanced undergraduate level and basic science courses in the first and second professional years are acceptable for graduate credit provided (*a*) the student qualifies for graduate study and has credit for the specific prerequisites of any desired course and (*b*) the grade achievement is of graduate quality as required by the instructor or the Graduate School.

The advanced undergraduate courses listed in the following sections may be acceptable for graduate credit or in some cases may be offered to enable the student to make up undergraduate subject deficiencies.

Subject code letters Code letters preceding course numbers identify the department or subject as follows:

ANAT	Anatomy
ANTH	Anthropology
BCHM	Biochemistry
BIOL	Biology
BUAD	Business Administration
CHEM	Chemistry
CMBL	Cell and Molecular Biology
EDCI	Curriculum and Instruction
EDFO	Educational Foundations
ENDN	Endodontics
ENGL	English
ENVH	Environmental Health
EPDM	Epidemiology
FMED	Family Life Education
GEOL	Geology
GRDN	Graduate Dentistry
HADM	Health Administration
HLED	Health Education
HLSC	Health Science
HLSR	Health Services
HIST	History
MFAM	Marriage and Family
MICR	Microbiology
NRSG	Nursing
NUTR	Nutrition and Dietetics
ORBI	Oral Biology
ORDN	Orthodontics
ORMD	Oral Medicine
ORPA	Oral Pathology
ORSR	Oral Surgery
PATH	Pathology
PERI	Periodontics
PHRM	Pharmacology
PETH	Physical Education and Health
PHYS	Physics
PHSL	Physiology and Biophysics
PSYC	Psychology
RELB	Religion, Biblical Studies
RELH	Religion, Historical Studies
RELP	Religion, Professional Studies
RELE	Religion, Theological and Ethical Studies
RELM	Religion, Mission Studies
RELT	Religion, Theological Studies
RLGN	Religion, General
SOCI	Sociology
SPPA	Speech-Language Pathology
STAT	Biostatistics

ANATOMY

FACULTY

DANIEL A. MITCHELL, JR., M.D. Loma Linda University SM 1947
Chairman; Professor of Anatomy, Associate Professor of Surgery
Gross anatomy, applied anatomy

PAUL C. ENGEN, D.D.S. University of Southern California 1949
Professor of Anatomy
Histology, histological techniques, comparative anatomy

GUY M. HUNT, M.D. Loma Linda University SM 1942; M.S.-MED. GS 1959
Professor of Anatomy and Neurology
Neuroanatomy

PAUL J. McMILLAN, PH.D. Loma Linda University GS 1960
Program Coordinator; Professor of Anatomy
Neuroendocrine systems, hormone regulation and action, histochemistry and image analysis

WALTER H. B. ROBERTS, M.D. Loma Linda University SM 1939
Professor of Anatomy
Gross anatomy, applied anatomy

ROBERT L. SCHULTZ, PH.D. University of California, Los Angeles 1957
Professor of Anatomy
Electron microscopy, histology, nervous system

C. DOUGLAS EDDLEMAN, PH.D. University of Texas, Austin 1973
Associate Professor of Anatomy
Histology, electron microscopy, cytomorphology of animal systems

HERBERT W. HENKEN, M.D. Loma Linda University SM 1945
Associate Professor of Anatomy and of Gynecology and Obstetrics
Gross anatomy, applied anatomy

WILLIAM M. HOOKER, PH.D. Loma Linda University GS 1969
Associate Professor of Anatomy
Neuroanatomy

P. BENIGNO NAVA, JR., PH.D. Loma Linda University 1974
Associate Professor of Anatomy
Gross anatomy, effects of age and diabetes on PNS, taste receptors

JOHN W. PATRICKSON, PH.D., Howard University 1978
Assistant Professor of Anatomy
Neuroanatomy, integrative processes of CNS

ASSOCIATE FACULTY

HAROLD SHRYOCK, M.D. Loma Linda University SM 1934
Emeritus Professor of Anatomy
Embryology, cytology, neuroanatomy

WM. HOLMES TAYLOR, M.D. Loma Linda University SM 1947
Clinical Professor of Anatomy
Gross anatomy, applied anatomy

JOHN A. ROSARIO, PH.D. Loma Linda University 1979
Assistant Professor of Anatomy
Gross anatomy, immunoelectron microscopy, pineal gland

WILLIAM WAGNER, M.D., Loma Linda University SM 1944
Clinical Assistant Professor of Anatomy
Gross anatomy, applied anatomy

The Department of Anatomy, in cooperation with other departments of the University, offers programs leading to the Master of Science and the Doctor of Philosophy degrees in the field of anatomy. The department is an active participant in the systems biology curricula, which consist of interdisciplinary courses and seminars coordinated by the faculties of the Departments of Anatomy and of Physiology and Pharmacology. The degree programs provide opportunities for qualified students to prepare for careers in teaching and research.

The student admitted to the anatomy graduate program will have an undergraduate degree with a strong component of biological sciences, including zoology and comparative vertebrate embryology. Genetics, comparative vertebrate anatomy, and histotechnique may be necessary to complete the program, although these are not required for admission.

Other requirements include a year each of physics, general chemistry, and organic chemistry. A foreign language and courses in statistics and computer science are encouraged.

Anatomy, the study of structure as it relates to function, is at the heart of all biomedical sciences. In addition to the study of gross anatomy, cell biology, histology, neuroanatomy, and embryology, the anatomy graduate student at Loma Linda University will learn to analyze cells utilizing electron microscopy, histochemistry, immunohistochemistry, cell culture, and quantitative image analysis on *in vivo* and *in vitro* systems. Actively investigated are the central and peripheral nervous systems and the endocrine system, especially the pineal, hypothalamus, and thyroid. Recent theses and publications have dealt with the development, ultrastructure, and immunohistology of the pineal gland, age- and diabetes-related changes in sensory nerve endings, and quantitation of immunohistochemically stained endocrine cells. At the doctoral level, teaching experience is required in both undergraduate and professional courses. Details of the program requirements are provided in the "Anatomy Program Guide." The following is a summary of these requirements.

MASTER OF SCIENCE

This curriculum provides opportunities for qualified students to gain experience in research methods (library and laboratory) while working on a significant problem. The student acquires experience in scientific communication by participating in seminars, writing critical reviews, and reporting the results of research experience either in thesis form or as a publishable paper.

Courses To qualify for this degree, the student must complete the following courses in anatomy: ANAT 537, 541, 542, 544; 8 units in anatomy research and 1 in thesis; 8 units in other basic science courses; and pass a comprehensive examination in these areas. For each year in residence, the student will complete 1 unit of Integrative Biology Graduate Seminar (ANAT 605).

DOCTOR OF PHILOSOPHY

The purpose of the program leading to the Doctor of Philosophy degree is to give individuals the preparation needed and the opportunity to pursue an in-depth, independent investigation under conditions favorable for the maturation of scholarly attitudes and habits. Admission to this program is based upon a demonstration of superior qualifications, either in undergraduate or graduate studies.

Residence A minimum of two full-time academic years is required in residence.

Courses Courses required for this degree are ANAT 537, 541, 542, 544; 1 unit of Integrative Biology Graduate Seminar (ANAT 605) for each year in residence; and 35 quarter units in advanced anatomy courses, cell biology, biochemistry, physiology, and other graduate courses appropriate to the student's goals. The specific course requirements will vary with the student's research emphasis. Final approval of the student's total program will be made by the student's committee in consultation with the anatomy faculty. Approximately 110 units beyond the bachelor's degree are usually completed by the time the Ph.D. is awarded.

Comprehensive examination The written and oral comprehensive examinations are designed to establish that the student has a broad understanding of structure and function. The student's ability to use that knowledge to identify and design experiments to resolve problems is also tested. Familiarity with the scientific literature and the ability to use that literature to defend the dissertation research proposal are important components of the oral examination.

Language requirement A student's advisory committee may require a demonstration of proficiency in a suitable natural language and/or computer language before advancement to candidacy. Students who have acquired such skills in their undergraduate studies have a distinct advantage.

Advancement to candidacy The student may apply for admission to doctoral candidacy after (*a*) passing the comprehensive examination, (*b*) passing any other examinations such as demonstrated proficiency in the use of computers and statistics required by the department, and (*c*) securing the support of his/her advisory committee.

Dissertation The candidate's capacity for independent investigation and scholarly achievement must be demonstrated by the presentation and oral defense of an acceptable dissertation.

General requirements For information about requirements and practices to which all graduate students are subject, the student should consult the *Academic Practices* section of division I of the Graduate School BULLETIN.

Combined M.D./Ph.D. or D.D.S./Ph.D. Combined programs allow qualified students to work on combined M.D./Ph.D. or D.D.S./Ph.D. degrees. Details are provided in the section *Programs and Degrees*.

ANAT 504 Oral Histology and Development SD (2)
Study of development, eruption, and microanatomy of the odontogenic apparatus. Fall.
Engen.

ANAT 526 Head and Neck Anatomy DN (surgical) (2)
Detailed dissection of the head and neck. Demonstration and lecture. Offered on demand.
Prerequisite: ANAT 541 or equivalent.
Staff.

ANAT 534 Histological Techniques (3)
Theory and practice in the preparation of tissue sections for microscope study using routine and specialized stains. Spring—odd years or by independent study.
Staff.

ANAT 537 Neuroscience (8)
An integrated approach to the fundamentals of neuroanatomy and neurophysiology, with applications to clinical neurology. Winter.
Staff.

ANAT 541 Gross Anatomy (10)
Anatomy of the head, neck, locomotor system, thorax, abdomen, pelvis, and perineum. Correlated with radiology, applied features, and embryological development. Summer, 4 units; fall, 6 units.
Staff.

ANAT 542 Cell, Tissue, and Organ Biology (5)
The microscopic structure of cells, tissues, and organs of the human body. Summer, 1 unit; fall, 2 units; winter, 2 units.
Staff.

ANAT 544 Human Embryology (3)
The plan of development as it pertains to the human. Consideration of principles. Laboratory work involving the use of both human and comparative materials.
Prerequisite: A course in vertebrate embryology. Fall.
Staff.

ANAT 545 Advanced Neuroanatomy (3)
Detailed study and dissection of the human nervous system. Spring—even years.
Prerequisite: ANAT 543.
Patrickson, Hooker.

ANAT 546 Electron Microscopy (3)
Designed to train the student to use the electron microscope. Basic theory, operational techniques, and tissue preparation. Summer—odd years.
Prerequisite: Histotechnique or equivalent.
Staff.

ANAT 547 Histochemistry (3)
The theoretical and practical aspects of histochemical methods as applied to tissue sections. One lecture and two three-hour laboratories/conferences weekly. Summer—even years.
Prerequisite: A course in biochemistry; ANAT 542 or equivalent.
McMillan.

ANAT 548 Advanced and Molecular Cytology (3)
A study of the ultrastructural and cytochemical analysis of a variety of differentiated cells. Spring—odd years.
Staff.

ANAT 549 Seminar: Topographical Chemistry (2)

The qualitative and quantitative distribution of enzymes and other chemically defined components of organs. Students will be responsible for one oral and one written report. On demand.

McMillan.

ANAT 554 Techniques in Experimental Morphology (2)

An introduction to selected methods used in the morphological analysis of organ and cellular function. Spring—odd years.

Nava.

ANAT 594 Special Topics in Anatomy (arranged)

Intensive study of a selected topic approved by the chairman of the department. Individual guidance by a staff member.

Staff.

ANAT 605 Integrative Biology Graduate Seminar (1)

This seminar, coordinated by the Departments of Anatomy, Pharmacology and Physiology, consists of reports from current literature and the presentation of student and faculty research on various aspects of regulatory and integrative biology as applied to cells, tissues, organs, and systems. Both students and faculty are expected to participate in a discussion and critical evaluation of the presentation.

Faculties of Anatomy, Pharmacology and Physiology.

ANAT 697 Research (1-25)

ANAT 698 Thesis (1-3)

ANAT 699 Dissertation (1-5)

BIOCHEMISTRY

FACULTY

CHARLES W. SLATTERY, PH.D. University of Nebraska 1965
Chairman; Professor of Biochemistry and Pediatrics
Physical chemistry of macromolecules

RICHARD E. BELTZ, PH.D. University of Southern California 1955
Professor of Biochemistry
Experimental oncology, mechanisms in the chemotherapy of cancer

GEORGE M. LESSARD, PH.D. University of California, Riverside 1973
Professor of Biochemistry
Oral biochemistry

W. BARTON RIPPON, PH.D. Newcastle University 1969
Professor of Biochemistry (on leave; Dean, Graduate School)
Physical biochemistry of macromolecular structure and function

BARRY L. TAYLOR, PH.D. Case Western Reserve University 1973
Professor of Biochemistry and Microbiology
Mechanism of oxygen chemoreceptors, bacterial chemotaxis

R. BRUCE WILCOX, PH.D. University of Utah 1962
Professor of Biochemistry
Biochemistry of the endocrine system, hormone-dependent carcinogenesis

JAMES W. BLANKENSHIP, PH.D. University of Wyoming 1969
Associate Professor of Biochemistry and Professor of Nutrition
Dietary influences on connective tissue structure, prostaglandin metabolism

E. CLIFFORD HERRMANN, PH.D. Virginia Polytechnic Institute 1970
Program Coordinator; Associate Professor of Biochemistry
Enzymology of blood coagulation and casein phosphorylation

GEORGE T. JAVOR, PH.D. Columbia University 1967
Associate Professor of Microbiology and Biochemistry
Cellular responses to reductive stress, control of porphyrin synthesis, mechanism of procaryotic cell division

TERRY D. SCHULTZ, PH.D. Oregon State University 1980
Associate Professor of Biochemistry and Nutrition
Vitamins, nutritional biochemistry

KELVIN A. W. HILL, PH.D. University of Notre Dame 1986
Assistant Professor of Biochemistry
Protein design/engineering, tRNA binding domains, gamma carboxyglutamic acid domains of protein C, recombinant DNA techniques

ASSOCIATE FACULTY

RAYMOND A. MORTENSEN, PH.D. Stanford University 1933
Distinguished Service Professor of Biochemistry
Rates of metabolism, metabolic pathways

U. D. REGISTER, PH.D. University of Wisconsin 1950
Professor of Biochemistry and Nutrition
Biochemistry of nutrition

DAVID J. BAYLINK, M.D. Loma Linda University 1957
Research Professor of Biochemistry and Medicine
Basic and clinical mineral metabolism, biochemistry of regulatory mitogen from bone matrix

LAWRENCE B. SANDBERG, M.D., PH.D. University of Illinois, University of Oregon 1957, 1966
Research Professor of Biochemistry and Pathology
Connective tissue proteins

ROLAND C. ALOIA, PH.D. University of California, Riverside 1970
Associate Professor of Biochemistry and Anesthesiology
Effects of anesthetic agents on biological membrane function

JOHN R. FARLEY, PH.D. University of California, Davis 1977
Research Associate Professor of Biochemistry and Medicine
Biochemical mechanisms of bone volume regulation and enzyme kinetics of mineral metabolism

DAVID A. HESSINGER, PH.D. University of Miami 1970
Associate Professor of Biochemistry and Physiology/Pharmacology
Structure and function of cell membranes, marine toxicology

RICHARD W. HUBBARD, PH.D. Purdue University 1961
Associate Professor of Biochemistry
Clinical chemistry, amino acid metabolism

THOMAS A. LINKHART, PH.D. University of California, Davis 1975
Associate Professor of Biochemistry and Research Associate Professor of Pediatrics
Cellular and molecular mechanisms of bone growth, resorption, and repletion

SUBBURAMAN MOHAN, PH.D. Bangalore University, India 1978
Research Associate Professor of Biochemistry, Medicine, and Physiology

JOHN J. ROSSI, PH.D. University of Connecticut, 1976
Adjunct Research Associate Professor of Biochemistry
The use of synthetic oligonucleotides in studies of gene expression

ANTHONY ZUCCARELLI, PH.D. California Institute of Technology 1974
Associate Professor of Biochemistry and Microbiology
Molecular genetics

KIN-HING WILLIAM LAU, PH.D. Iowa State University 1982
Research Assistant Professor of Biochemistry and of Medicine
Enzymology of bone metabolism

DONNA D. STRONG, PH.D. University of California, Los Angeles 1977
Research Assistant Professor of Biochemistry and Medicine
Cloning and expression of bone-related growth factors and matrix proteins

BRUCE WALLACE, PH.D. McMaster University 1975
Adjunct Assistant Professor of Biochemistry
Application of oligonucleotide probes to biological problems, including those of human genetics

JON E. WERGEDAL, PH.D. University of Wisconsin 1963
Research Assistant Professor of Biochemistry and Medicine
Bone metabolism

Programs The Department of Biochemistry offers study programs leading to the Master of Science and the Doctor of Philosophy degrees. Tailored to individual interest, the programs provide a broad biochemical background yet allow the student to develop fully a special area of interest. The Master of Science degree provides content appropriate for persons preparing to teach at the secondary level or in related professional school areas, or for persons intending to pursue careers as research technicians. The Doctor of Philosophy program is designed to prepare the graduate for a career in independent research and teaching. In addition to these programs, combined M.D./M.S., D.D.S./M.S., M.D./Ph.D., and D.D.S./Ph.D. degrees are offered. The combined M.S./professional degree is designed to provide additional content or research experience as background for postgraduate medical or dental education. The combined Ph.D./professional degree prepares the student for a future in academic medicine or dentistry, combining research, teaching, and clinical practice.

M.S. program A Under this plan the student completes 20 units of courses in biochemistry beyond the introductory course and carries out research leading to the preparation and successful defense of a thesis or publishable paper reporting on the research.

M.S. program B Under this plan the student completes 20 units of courses in biochemistry beyond the introductory course and additional courses in related fields to complete 44 quarter units. The student must also pass a comprehensive examination over the major and minor fields.

Ph.D. program For the Doctor of Philosophy degree, students must complete at least 30 units of courses in biochemistry beyond the introductory course and 20 units in related fields. Students entering the Ph.D. program will choose a laboratory and are expected to participate in research during their first year. They must pass both written and oral comprehensive examinations. Opportunity is given to acquire teaching experience. Doctoral candidates must present and defend a research proposal and carry out research leading to the preparation and successful defense of a dissertation.

Details of the graduate program are given in the *Student Guide* published by the Department of Biochemistry.

Combined program A combination of academic and professional degrees is described on page 42 of this BULLETIN.

Prerequisites The following courses or their equivalents are prerequisites to the department courses.

Differential and integral calculus (8)
General physics (12)
Organic chemistry (12)
Physical chemistry (8)
General biology (12)
Upper division biology (4)

Applicants must pass the American Chemical Society (ACS) standardized examinations in organic and physical chemistry. These entrance examinations must be taken prior to registration.

The department reserves the right to decide on the equivalence of courses presented by the applicant. Applicants who lack minor aspects of the prerequisites may be provisionally accepted. Prerequisites must be completed before the applicant is accepted into regular status and before the student takes departmental advanced courses numbered above 540.

General information For provisions applicable to the basic sciences, the student should consult Specific Requirements for Basic Science Programs in the *Programs and Degrees* section of division I of the Graduate School BULLETIN.

For information about requirements and practices to which all graduate students are subject, the student should consult the *Academic Practices* section of division I of the Graduate School BULLETIN.

BCHM 504 Introduction to Biochemistry (5)
Chemistry and metabolism of proteins, carbohydrates, lipids, and nucleic acids. Enzymes, vitamins and minerals, bioenergetics. Replication, transcription, translation, and regulation of cell function. Special topics in biochemistry related to nutrition. Lecture and demonstration.

BCHM 505 Seminar in Biochemistry (1)

BCHM 506 Seminar Presentation in Biochemistry (1)

BCHM 514 Problem-based Learning in Medical Biochemistry (1)
Acid-base equilibria, quantitative analysis of blood, case-base tutorials in medical biochemistry, clinical applications of biochemistry to accompany BCHM 515.

BCHM 515, 516 Principles of Medical Biochemistry (4, 6)
Chemistry of amino acids and proteins. Enzyme properties and mechanisms. Bioenergetics. Chemistry and metabolism of carbohydrates, lipids, amino acids, and nucleic acids. Protein biosynthesis and the control of gene expression. Special topics in physiological chemistry: connective tissue components, acid-base balance, hormones, vitamins, and minerals.

BCHM 523 Introduction to Physical Biochemistry (3)
Introduction to biochemical thermodynamics, proteins and protein physical chemistry, enzyme kinetics and mechanisms, and bioenergetics.

BCHM 525 Metabolic Interrelationships and Control (5)
Structure, function, and control of enzymes. Control of energy metabolism. Cellular mechanisms of hormone action.
Prerequisite: BCHM 516 or CHEM 482.

BCHM 528 Principles of Molecular Biology and Genetics (5)
A survey of microbial genetics, procaryotic and eucaryotic molecular biology, and basic principles of human genetics. Identical to MICR 519.

BCHM 534 Techniques of Biochemistry (5)
Intensive integrated laboratory experience in protein chemistry, and the physical characterization of macromolecules. Writing of scientific papers.

BCHM 539 Molecular Biology of Procaryotes and Recombinant DNA (4)
Bacterial viruses, transposable genetic elements, plasmids, modes of DNA transfer, recombination, mutation and repair, molecular cloning, DNA sequencing and directed mutagenesis. Identical to CMBL 538.
Prerequisite: BCHM 516 or CHEM 482.

BCHM 544 Advanced Topics in Biochemistry (2-4)
Recommended M.S. (2 + 2); Ph.D. (2 + 2 + 2).
Examples: membrane biochemistry, transport and bioenergetics, physical methods in biochemistry, metabolic regulation, protein structure, hormonal regulation of metabolism.

BCHM 545 Molecular Biology of Eucaryotes and Gene Regulation (4)
Characteristics of promoters, operons, infectious agents, eucaryotic gene structure, RNA splicing, chromosome structure, transcriptional and posttranscriptional regulation of gene expression, cell proliferation, oncogenes. Identical to CMBL 539.
Prerequisite: BCHM 539.

BCHM 697 Research (arranged)

BCHM 698 Thesis (arranged)

BCHM 699 Dissertation (arranged)

BIOLOGY

FACULTY

LEONARD R. BRAND, PH.D. Cornell University 1970
Chairman; Professor of Biology
Animal behavior, mammalogy

GARY L. BRADLEY, PH.D. University of California, Davis 1982
Professor of Biology
Population genetics

H. PAUL BUCHHEIM, PH.D. University of Wyoming 1978
Professor of Geology and Biology
Geology, paleontology

HAROLD G. COFFIN, PH.D. University of Southern California 1955
Professor of Biology
Paleontology

JOSEPH G. GALUSHA, D.PHIL. Oxford University 1975
Program Coordinator; Professor of Biology
Animal behavior, behavioral ecology

EARL W. LATHROP, PH.D. University of Kansas 1957
Professor of Biology
Floristics, plant ecology

BENJAMIN H. S. LAU, PH.D. University of Kentucky 1966, M.D. Loma Linda University SM 1980
Professor of Microbiology
Immunology, medical bacteriology, mycology

NORMAN L. MITCHELL, PH.D. University of Western Ontario 1967
Professor of Biology
Plant pathology

ARIEL A. ROTH, PH.D. University of Michigan 1955
Professor of Biology
Invertebrate zoology

RICHARD D. TKACHUCK, PH.D. University of California, Los Angeles 1970
Professor of Biology
Comparative physiology, biogeography

ROBERT A. CHILSON, PH.D. University of Wisconsin 1975
Associate Professor of Biology
Electrophysiology

ELWOOD S. McCLUSKEY, PH.D. Stanford University 1959
Associate Professor of Physiology
Comparative physiology, entomology

DAVID L. COWLES, PH.D. University of California, Santa Barbara 1987
Assistant Professor of Biology
Physiological ecology, marine biology

ERNEST R. SCHWAB, PH.D. Loma Linda University GS 1988
Assistant Professor of Biology
Insect physiology

ASSOCIATE FACULTY

LEONARD R. BULLAS, PH.D. Montana State University 1963
Professor of Microbiology
Bacterial genetics

MARVIN A. PETERS, PH.D. University of Iowa 1969
Professor of Physiology and Pharmacology
Drug metabolism

CLYDE L. WEBSTER, PH.D. Colorado State University 1972
Professor of Chemistry
Geochemistry

C. DOUGLAS EDDLEMAN, PH.D. University of Texas, Austin 1973
Associate Professor of Anatomy
Cytomorphology of reproductive systems

DAVID A. HESSINGER, PH.D. University of Miami 1970
Associate Professor of Physiology and Pharmacology
Marine toxins, cellular and molecular biology

ANTHONY J. ZUCCARELLI, PH.D. California Institute of Technology 1974
Associate Professor of Microbiology
Molecular genetics, microbiology

The Department of Biology offers programs leading to the degrees of Master of Arts and Doctor of Philosophy in biology and Master of Science in paleontology. These programs of study have been planned to provide a broader and more unified approach to the life sciences than is often customary. Nevertheless, a considerable degree of specialization is required as is evidenced by the conduct of significant, original research. The planning of individual student programs provides for an appropriate degree of specialization in the selection of courses related to the area of research interest. Some areas of specialization are: animal behavior, animal physiology, ecology, entomology, genetics, histology and cytology, mammalogy, cell biology, virology, parasitology, paleobiology, and plant science, particularly plant ecology. Study in various areas, ranging from molecular biology to natural history is available to the student seeking preparation for teaching or for research in modern biology.

Facilities Research and teaching laboratories and museum facilities for the use of graduate students in biology are located on the La Sierra campus. A wide variety of research equipment is available for research in the areas of specialization listed above. A number of graduate students also participate in research and classes on the Loma Linda campus.

Field station Through the cooperation of the Walla Walla College Marine Station, Anacortes, Washington, facilities are available for marine courses and research by graduate students of this University.

Student aid Fellowships offered by agencies such as the National Science Foundation and the National Institutes of Health are tenable at this University. A limited number of fellowships and scholarships are available from University funds. Research and teaching assistantships are also available from the department. Further information can be obtained from the chairman of the department.

Dr. Edmund C. Jaeger has generously provided a perpetual endowment fund that permits the yearly awarding of several Edmund C. Jaeger Fellowships in biology to meritorious students.

General requirements For information about requirements and practices to which all graduate students are subject, the student should consult the *Academic Practices* section of division I of the Graduate School BULLETIN.

MASTER OF ARTS

Admission Applicants must meet the general admission requirements of the Graduate School. Expected undergraduate preparation includes a bachelor's degree from an accredited college or university, with a biology major or equivalent; one year each of college mathematics and general

chemistry; and at least 20 quarter units from two or more of the following: organic chemistry, biochemistry, general physics, geology, or physical chemistry.

Curriculum The following constitute the curriculum for the Master of Arts degree in biology: a minimum of 48 quarter units of academic credit, 30 units in biology, including 15 at or above the 500 level (exclusive of research); a course in paleontology or speciation or history and philosophy of biology (such as BIOL 489, 544, 558; or GEOL 548) while in residence; seminar in biology, 1 unit; attendance at all general departmental seminars; a course in research techniques (if not taken in the undergraduate program); teaching experience during at least one quarter (registration in BIOL 604 recommended). Research and thesis credit and final oral examination.

A reading knowledge of one foreign language is recommended for students planning to enter a Doctor of Philosophy program.

DOCTOR OF PHILOSOPHY

Admission The accepted applicant must meet the general admissions requirements of the Graduate School. Expected undergraduate preparation in biology includes general biology (or the equivalent) and at least one course each in botany, zoology, cell biology (or one year of biochemistry), and genetics. Expected undergraduate preparation in cognate subjects includes one year of college mathematics (calculus recommended); one year of general physics; general chemistry, organic chemistry; and at least one course from the following: biochemistry, calculus, geology. One year of foreign language is expected.

Residence requirement A minimum of two consecutive academic years of work is required beyond the master's degree. This is interpreted as registration in courses, seminars, or research for a total of 72 quarter units beyond the master's degree (or 120 units beyond the baccalaureate degree).

Required courses The following courses are required at some time in the student's academic career, during either the undergraduate or the graduate program:

biostatistics
biology of at least one taxon
advanced genetics
paleontology (at Loma Linda University)
developmental biology
animal physiology
two of the following:
  additional paleontology
  biogeography
  advanced philosophy of science

Two units of seminar are required beyond the master's level. Attendance at all general departmental seminars is required of the biology graduate student while in residence at Loma Linda University.

As many as 15 units of course work in cognate fields, such as biochemistry or biophysics, may be applied toward the program with the approval of the student's guidance committee.

During residence the student is required to take a 3-unit course in religion (beyond the master's level).

Teaching is required during at least two quarters. It may be done in the laboratory or it may involve presenting part of the lectures for a course. Registration in BIOL 604 is recommended.

Comprehensive examination The student is expected to have a sufficient knowledge of the various fields of biology to serve as a broad basis for a sound philosophy of biology as well as to give perspective and background for future specialization and research. The comprehensive examination will assume a knowledge of the major groups of plants and animals and micro-organisms and an understanding of such fields as are listed in the preceding paragraphs. It is designed to test the breadth and depth of the student's thinking and philosophy rather than the mere memorization of facts. Wide reading is expected since it will aid in the student's preparation in areas not covered specifically by courses.

Computer proficiency The student must demonstrate proficiency in the use of a computer and computer language, according to department guidelines.

Advancement to candidacy The student may apply for admission to doctoral candidacy after (1) meeting the computer proficiency requirement, (2) passing the comprehensive examination, and (3) passing any other examinations required by the department. The department bases its recommendation to the dean of the Graduate School on the student's performance in the comprehensive examination, on previous course work taken while in residence, and on other qualifications for further pursuit of doctoral work.

Dissertation The candidate's investigative capacity must be demonstrated by a dissertation based on independent work and original research.

Oral defense of dissertation The oral examination is taken when the dissertation content and organization are in final form. The examination emphasizes the dissertation research, but it may cover the relationship of the research to fundamental principles in other fields of biology also.

MASTER OF SCIENCE — Paleontology

A Master of Science degree in paleontology is offered through the department of biology. For further details, see page 135 of this BULLETIN.

DOCTOR OF PHILOSOPHY — Biology with Paleontology Emphasis

Requirements are the same as for the Doctor of Philosophy degree in biology without the paleontology emphasis, with the exceptions noted in the following.

Admission Expected undergraduate preparation in biology includes general biology (or the equivalent), genetics, botany, and two additional courses in biology. Expected undergraduate preparation in cognate subjects and geology includes one year of college mathematics (calculus recommended), one year of general physics, general chemistry, one quarter of organic chemistry (additional organic chemistry recommended), physical geology, historical geology, and general paleontology. One year of undergraduate foreign language study is expected.

Required courses The following courses are required at some time during either the undergraduate or the graduate program:

biostatistics
broad biology of at least two taxa (phylum or class)
stratigraphy
sedimentology
three advanced paleontology courses (two at this University)

two of the following:
advanced genetics
animal physiology
cell physiology **or**
cell and molecular biology **or**
one year of biochemistry

three of the following:
biogeography
biosystematics and speciation
field interpretations in historical geology
advanced philosophy of science

Seminar and teaching requirements are the same as for the biology degree without the paleontology emphasis.

Comprehensive examination The comprehensive examination is defined and administered as in the regular biology doctoral program, except that the list of subjects to be covered will be oriented toward the integration of biological and geological phenomena for the interpretation of earth history. It assumes a knowledge and an understanding of such fields as are listed in the preceding paragraphs.

COMBINED DEGREES

Combined M.D./Ph.D. or D.D.S./Ph.D. For students electing a combined program leading to the Doctor of Medicine and Doctor of Philosophy degrees or to the Doctor of Dental Surgery and Doctor of Philosophy degrees, with the Ph.D. earned in biology, the following adaptations of the biology Ph.D. requirements apply:

1. As many as 30 units of credit for basic science courses and up to 30 units of research and/or graduate courses done as part of the electives of the professional curriculum, but not more than a total of 48 units, may be applied to the Ph.D. program.
2. The "animal physiology" and the "biostatistics" requirements would be met by the professional curriculum.

Combined M.D./M.A. or D.D.S./M.A. For students electing a combined program with the Master of Arts degree earned in biology, up to 12 units of credit for basic science courses and up to 6 units of research and/or graduate courses done as part of the electives of the professional curriculum may be applied to the master's program.

Biology minor At times, students in other University departments will seek a biology minor. A biology minor for students majoring in other departments may include any courses listed under the Department of Biology except those also listed from the department in which the major is taken. At least *one course* in the minor must be from among the following primary offerings of the Department of Biology: BIOL 515, 519, 524, 544, 558.

In addition to the primary offerings of the department, the course listing includes a number of other courses that are of potential interest to graduate students in biology. The student may take courses in other departments as part of the graduate work, according to special interests and needs. See the Departments of Microbiology, Physiology, Anatomy, and Biochemistry.

COURSES

GRADUATE COURSES

BIOL 515 Biogeography (3)
Present distribution and past migrations of the natural populations of organisms. Offered alternate years.
Prerequisite: Biology or systematics of at least two plant or animal taxa desirable.
Tkachuck.

BIOL 518 Readings in Ecology (2)
Study, analysis, and discussion of current and classic papers. Offered on demand.
Prerequisite: Ecology or consent of the instructor.
Lathrop.

BIOL 519 Methods of Plant Ecology (3)

Analysis and interpretation of natural communities. Includes fieldwork, with emphasis on physical and biotic measurements. Especially useful for students needing to relate habitat and environmental factors to their special field projects. Offered alternate years.

Prerequisite: Field biology or general ecology.

Lathrop.

BIOL 524 Advanced Invertebrate Biology (3)

Critical investigation of contemporary invertebrate phylogenetic schemes. Analysis of pertinent information from morphology, embryology, physiology, biochemistry, and paleontology. Three class hours. Offered alternate years.

Prerequisite: A course in invertebrate zoology or consent of the instructor.

Staff.

BIOL 525 Selected Topics in Marine Biology (2)

Topics selected either for their importance in current marine biology research or for their philosophical significance: coral reef biology, deep-sea biology, marine biogeography, paleoecology of marine organisms. Concentration on the invertebrates. Offered alternate years.

Prerequisite: Marine biology or invertebrate zoology or consent of the instructor.

Staff.

BIOL 536 Seminar in Animal Behavior (2)

Critical analysis of the research literature on selected topics in animal behavior.

Prerequisite: A course in animal behavior or consent of the instructor. Offered on demand.

Brand.

BIOL 544 Biosystematics and Speciation (4)

Dynamic processes of biological systems as revealed by genetics, distribution, isolation, natural selection, and morphology. Lectures, discussions, field trips, research reports. Offered alternate years.

Prerequisite: Course work in one or more taxa.

BIOL 546 Molecular Genetics (4)

A study of the tools of molecular biology in the context of current research. Topics include the characteristics of mobile genetic elements, bacteriophage and plasmid cloning vehicles; genetic recombination; the enzymes used in DNA manipulation, cloning and directed mutagenesis; prokaryotic promoters and regulatory sequences.

BIOL 558 History and Philosophy of Science (4)

Study of selected topics in the history and philosophy of science, and the application of these principles in analyzing contemporary scientific trends.

Brand.

BIOL 564 Biochemistry and Physiology of Symbiotic Organisms (4)

Examination of the interface between host and symbiont at the biochemical and physiological levels. Emphasis placed on the analysis of current research literature. Lecture two units, laboratory two units. Offered alternate years.

Tkachuck.

BIOL 586 Current Topics in Biology (1-4)

Reviews of current interest in specific areas of biological science, offered at the discretion of the department. Different sections of the course may be repeated for additional credit.

Prerequisite: Consent of the instructor.

BIOL 604 College Biology Teaching (2-4)

Discussion of distinctive teaching methods. Registration is normally for three or four units. The third (and fourth) unit involves responsibility for one (or two) laboratory sections or selected class sessions of an undergraduate class.

McCluskey.

BIOL 605 Seminar in Biology (1)

Selected topics dealing with recent developments.

Staff.

BIOL 606 Special Projects in Biology (1-4)
Responsibility for a special research project in the field, laboratory, museum, or library. May be repeated for additional credit.
Staff.

BIOL 615 Concepts and Methods of Research in Biology (2)
Concepts and methods used in biological research, including scientific writing and literature.
Staff.

BIOL 697 Research (1-18 for M.A.; 1-25 for Ph.D.)

BIOL 698 Thesis (1-3)
Registration for the terminal part of the master's thesis should be under this number.

BIOL 699 Dissertation (1-3)
Registration for at least the terminal part of the doctoral dissertation research should be under this number.

COURSES

UPPER DIVISION COURSES
APPLICABLE TO BIOLOGY GRADUATE PROGRAM

Graduate students taking courses below the 500 level are expected to do additional work beyond what is expected of undergraduate students.

BIOL 315 Biological Techniques (4)
BIOL 404 Cellular and Molecular Biology (4)
BIOL 406 Introduction to Marine Biology (4)
BIOL 408 Biology of Marine Invertebrates (4)
BIOL 414 General Ecology (4)
BIOL 415 Biological Instrumentation (4)
BIOL 418 Biology of Lower Plants (4)
BIOL 419 Biology of Higher Plants (4)
BIOL 424 Wilderness Ecology (3)
BIOL 425 Limnology (4)
BIOL 427 Human Ecology (2)
BIOL 434 Histology (4)
BIOL 435 Medical Parasitology (4)
BIOL 436 Immunology (4)
BIOL 438 Mammalogy (4)
BIOL 446 Mammalian Anatomy (5)
BIOL 447 Genetics (4)
BIOL 449 Population Biology (4)
BIOL 456 Plant Pathology (4)
BIOL 465 Ornithology (4)
BIOL 466 Vertebrate Physiology (4)
BIOL 467 Herpetology (4)
BIOL 468 Plant Anatomy (4)
BIOL 469 Animal Behavior (4)
BIOL 470 Protozoology (4)
BIOL 474 Microbiology (5)
BIOL 475 General Entomology (4)
BIOL 476 Biostatistics (4)
BIOL 478 Plant Physiology (4)
BIOL 485 Systematic Botany (4)
BIOL 486 Current Topics in Biology (1-4)
BIOL 487 Biology of the Galapagos Islands (4)

BIOL 488 Paleobiology (4)

BIOL 489 Philosophy of Science (4)

BIOL 499 Directed Study (1-4)

Rosario Beach summer courses — see College of Arts and Sciences BULLETIN for listings

BASIC MEDICAL SCIENCE COURSES

Numerous basic medical science courses are available to biology graduate students. Some are listed here.

ANAT 546 Electron Microscopy (3)
ANAT 548 Advanced and Molecular Cytology (3)
ANAT 554 Techniques in Experimental Morphology (3)
ENVH 566 Air Quality and Human Health (2-4)
ENVH 568 Water Quality Assurance (3)
ENVH 569 Environmental Sampling and Analysis (4)
ENVH 586 Environmental Health Administration (3)
MICR 531, 532 Fundamentals of Microbiology (5, 4)
MICR 534 Microbial Physiology (4)
MICR 555 Microbial Genetics (3-4)
MICR 556 Microbial Genetics Laboratory (2)
MICR 565 Virology (3)
MICR 566 Cell Culture (3)
MICR 574 Arthropod Vectors of Infectious Agents (4)
MICR 575 Arthropod Vectors Laboratory (1-2)
MICR 576 Field Medical Entomology (3)
MICR 585 Helminthology (4)
PHSL 535 Comparative Physiology (5)
PHSL 541, 542 Cell and Molecular Biology I, II (4, 4)
PHSL 596 Readings in Comparative Physiology (1)
PHSL 597 Great Books in Physiology (1)
STAT 509 General Statistics (3)
STAT 521 Biostatistics I (4)
STAT 522 Biostatistics II (4)
STAT 523 Biostatistics III (4)
STAT 568 Data Analysis (2-3)

DENTISTRY

FACULTY

THOR C. BAKLAND, D.D.S. Loma Linda University SD 1962
Coordinator, graduate program in dentistry
Professor of Restorative Dentistry
Restorative dentistry

J. MILFORD ANHOLM, D.D.S. University of the Pacific 1946; M.S. Loma Linda University GS 1962
Professor of Orthodontics
Orthodontics

LEIF K. BAKLAND, D.D.S. Loma Linda University SD 1963
Professor of Endodontics
Endodontics

PHILIP J. BOYNE, D.M.D. Tufts University 1947; M.S. Georgetown University 1961
Professor of Oral and Maxillofacial Surgery
Oral and maxillofacial surgery

BERNARD C. BYRD, D.D.S. Emory University 1953; M.S. University of Southern California 1964
Professor of Oral and Maxillofacial Surgery
Oral and maxillofacial surgery

MAX CRIGGER, D.D.S. Ohio State University 1965; M.S. University of Rochester 1972
Professor of Periodontics
Periodontics

ELMER KELLN, D.D.S. University of Nebraska 1949; M.S.D. University of Minnesota 1960
Professor of Oral Pathology
Oral pathology

ROBERT D. KIGER, D.D.S. Loma Linda University SD 1970; M.S. University of Oregon 1973
Professor of Periodontics
Periodontics

JUDSON KLOOSTER, D.D.S. University of the Pacific 1947; M.M.S. Tulane University 1968
Professor of Restorative Dentistry
Restorative dentistry

DONALD L. PETERS, D.D.S. Loma Linda University SD 1961; M.S. GS 1969
Professor of Endodontics
Endodontics

JOHN E. PETERSON, JR., D.D.S. Loma Linda University SD 1970; M.S. GS 1978
Professor of Orthodontics and Pedodontics
Orthodontics and pedodontics

W. EUGENE RATHBUN, D.D.S. Loma Linda University SD 1965; PH.D. University of California, Los Angeles 1970
Professor of Periodontics
Periodontics

JAMES H. SIMON, D.D.S. Temple University 1961
Professor of Endodontics
Endodontics

MAHMOUD TORABINEJAD, D.M.D. University of Tehran 1971; M.S.D. University of Washington 1976
Professor of Endodontics
Endodontics

ROLAND D. WALTERS, D.D.S. Loma Linda University SD 1957; M.S. GS 1967
Professor of Orthodontics
Orthodontics

DAVID ANDERSON, D.D.S. Loma Linda University SD 1970
Associate Professor of Oral and Maxillofacial Surgery
Oral and maxillofacial surgery

LOGAN W. BARNARD, PH.D. University of Utah 1971
Associate Professor of Orthodontics
Orthodontics

A. DURWIN H. CHAMBERLAIN, D.D.S. University of Maryland 1969; M.P.H. Loma Linda University SPH 1975; M.S. Loma Linda University GS 1982
Associate Professor of Periodontics
Periodontics

RALEIGH R. CUMMINGS, D.D.S. Loma Linda University SD 1966; M.S. GS 1970
Associate Professor of Endodontics
Endodontics

LLOYD E. GAUNTT, D.D.S. Loma Linda University SD 1963; M.S. GS 1965
Associate Professor of Orthodontics
Orthodontics

GEORGE C. GAMBOA, D.D.S. University of the Pacific 1946; M.S.D. University of Minnesota 1953
Associate Professor of Oral and Maxillofacial Surgery
Oral and maxillofacial surgery

J. STEVEN GARRETT, D.D.S. Northwestern University 1971; M.S. Loma Linda University GS 1976
Associate Professor of Periodontics
Periodontics

VIRGIL V. HEINRICH, D.D.S. Loma Linda University SD 1961; M.S. GS 1964
Associate Professor of Orthodontics
Orthodontics

ARTHUR J. MORGAN, D.D.S. Loma Linda University SD 1960; M.S. GS 1963
Associate Professor of Orthodontics
Orthodontics

GARY MORIKONE, D.D.S. University of the Pacific 1949; M.S. Loma Linda University GS 1967
Associate Professor of Orthodontics
Orthodontics

STEVEN G. MORROW, D.D.S. Loma Linda University SD 1960
Associate Professor of Endodontics
Endodontics

GORDON M. RICK, D.D.S. Loma Linda University SD 1968; M.S. GS 1972
Associate Professor of Oral Pathology
Oral pathology

ULF WIKESJO, L.D.S. University of Lund 1973; M.S. GS 1987
Associate Professor of Periodontics
Periodontics

JAMES R. WISE, D.D.S. Loma Linda University SD 1967; M.S. GS 1971
Associate Professor of Orthodontics
Orthodontics

ROLF NILVEUS, L.D.S. 1963, ODONT.DR. 1978, University of Lund
Associate Professor of Periodontics
Periodontics

NORMAN S. CARTER, D.D.S. Loma Linda University SD 1973
Assistant Professor of Orthodontics
Orthodontics

JOSEPH M. CARUSO, D.D.S. Loma Linda University SD 1973; M.S. GS 1975; M.P.H. SPH 1976
Assistant Professor of Orthodontics
Orthodontics

EARL R. CRANE, D.D.S. Northwestern University 1938; M.S. University of Michigan 1942
Assistant Professor of Orthodontics
Orthodontics

CLELAN G. EHRLER, D.D.S. Loma Linda University SD 1968; M.S. GS 1971
Assistant Professor of Orthodontics
Orthodontics

BERNARD G. GANTES, D.D.S. Loma Linda University SD 1971, M.S. GS 1987
Assistant Professor of Periodontics
Periodontics

TOUFIC M. JEIROUDI, D.D.S. University of Damascus 1978; M.S. Loma Linda University GS 1982
Assistant Professor of Orthodontics
Orthodontics

LAWRENCE E. McEWEN, D.D.S. Loma Linda University SD 1963
Assistant Professor of Orthodontics
Orthodontics

LEE E. OLSEN, D.D.S. Loma Linda University SD 1967; M.S. GS 1969
Assistant Professor of Orthodontics
Orthodontics

THOMAS L. ROBERTSON, D.D.S. Marquette University 1959; M.S. Ohio State University 1963
Assistant Professor of Orthodontics
Orthodontics

R. DAVID RYNEARSON, D.D.S. Loma Linda University SD 1971; M.S. GS 1987
Assistant Professor of Orthodontics
Orthodontics

WILLIS L. SCHLENKER, D.D.S. Loma Linda University SD 1957
Assistant Professor of Orthodontics
Orthodontics

LAWRENCE W. WILL, D.D.S. Loma Linda University SD 1970; M.S. GS 1973
Assistant Professor of Orthodontics
Orthodontics

ASSOCIATE FACULTY

FLOYD S. BRAUER, M.D. Loma Linda University SM 1951
Professor of Anesthesiology
Anesthesiology

JAN H. EGELBERG, L.D.S. University of Lund 1960; ODONT. DR. University of Lund 1967
Professor of Periodontics
Dental research

ROBERT M. RICKETTS, D.D.S. Indiana University 1945; M.S. University of Illinois 1950
Professor of Orthodontics
Orthodontics

RICHARD A. SIMMS, D.D.S. Howard University 1953; M.S. Loma Linda University GS 1963
Professor of Orthodontics
Orthodontics

GARLAND E. SCOTT, PH.D. North Carolina State University 1972
Professor of Orthodontics
Orthodontics

JOHN L. TOMLINSON, PH.D. University of Washington 1967
Professor of Orthodontics
Materials engineering

W. HOWARD DAVIS, D.D.S. University of Southern California 1948
Associate Professor of Oral Surgery
Oral and maxillofacial surgery

LAWRENCE D. DAY, D.D.S. University of Illinois 1953; M.S. Loma Linda University GS 1969
Associate Professor of Oral and Maxillofacial Surgery
Oral and maxillofacial surgery

JOHN P. DEVINCENZO, D.D.S. Loma Linda University SD 1964; M.S. GS 1967
Associate Professor of Orthodontics
Orthodontics

KARL NISHIMURA, D.D.S. Loyola University 1960; M.S. University of Illinois 1963
Associate Professor of Orthodontics
Orthodontics

JOHN K. PEARSON, D.D.S. Loma Linda University SD 1969; M.S. GS 1971
Associate Professor of Orthodontics
Orthodontics

RUSSELL O. SEHEULT, D.D.S. Loma Linda University SD 1976
Associate Professor of Oral and Maxillofacial Surgery
Oral and maxillofacial surgery

MERRILL E. SCHMIDT, D.D.S. Loma Linda University SD 1962
Associate Professor of Endodontics
Endodontics

DALE E. STRINGER, D.D.S. The University of Iowa 1972
Associate Professor of Oral and Maxillofacial Surgery
Oral and maxillofacial surgery

NELSON R. GATOV, D.D.S. Loma Linda University SD 1975; M.S. GS 1977
Assistant Professor of Orthodontics
Orthodontics

KENNETH H. HARRISON, D.D.S. Loma Linda University SD 1975; M.S. GS 1979
Assistant Professor of Orthodontics
Orthodontics

RANDALL E. HOFF, D.D.S. Loma Linda University SD 1983; M.S. GS 1986
Assistant Professor of Orthodontics
Orthodontics

ROBERT J. HOMER, D.D.S. Loma Linda University SD 1957; M.S. GS 1982
Assistant Professor of Orthodontics
Orthodontics

DAVID J. JO, D.D.S. Loma Linda University SD 1982; M.S. GS 1985
Assistant Professor of Orthodontics
Orthodontics

RONALD M. KAMINISHI, D.D.S. Northwestern University 1968
Assistant Professor of Oral Surgery
Oral and maxillofacial surgery

ANTHONY B. LIER, D.D.S. Loma Linda University SD 1975; M.S. GS 1981
Assistant Professor of Orthodontics
Orthodontics

ROBERT D. MITCHELL, D.D.S. Loma Linda University SD 1978; M.S. GS 1985
Assistant Professor of Orthodontics
Orthodontics

RONALD C. PARKER, D.D.S. Loma Linda University SD 1971; M.S. GS 1973
Assistant Professor of Orthodontics
Orthodontics

LAURENCE A. SIEFERT, D.D.S. Loma Linda University SD 1968; M.S. GS 1978
Assistant Professor of Orthodontics
Orthodontics

RAYMOND M. SUGIYAMA, D.D.S. Western Reserve University 1964; M.S. Loma Linda University GS 1968
Assistant Professor of Orthodontics
Orthodontics

GUY D. TAYLOR, D.D.S. West Virginia University 1967; M.S. 1971
Assistant Professor of Orthodontics
Orthodontics

JAMES YOUNG, D.M.D. University of the Philippines 1973; M.S. Loyola University 1977
Assistant Professor of Orthodontics
Orthodontics

GUNTHER BLASEIO, D.D.S. Erlangen University 1977; M.S. GS 1986
Lecturer in Orthodontics
Orthodontics

Graduate study leading to the Master of Science degree or a specialty certificate is offered in the following areas:

endodontics oral and maxillofacial surgery orthodontics periodontics

The basic science approach to research and clinical practice is emphasized. The programs are organized in line with the standards of the Council on Dental Education of the American Dental Association and in objectives and content meet the requirements of the respective specialty boards.

Admission An appropriate degree from an accredited college, or the equivalent, and other specifics and personal qualifications are required for admission for graduate study. A doctoral degree in dentistry (Doctor of Dental Surgery or Doctor of Dental Medicine, or the equivalent) is required for admission to all programs. Application for admission should be made before or by October 15 for the programs in endodontics and orthodontics, and November 15 for the oral and maxillofacial surgery and periodontics programs.

Residence The required time in residence varies with the program. For length of program, refer to information under program description.

Grades The student must achieve a general grade point average of not less than 3.00, with no subject below 2.0. In addition to earning acceptable scholastic marks, evidence of personal and professional fitness for growth in the science and art of the specialty must be submitted.

Advancement to candidacy The student desiring to qualify for a master's degree should petition the Graduate Council for advancement to candidacy not later than the close of the first academic year. At the same time the proposed thesis topic, an outline, and a comprehensive bibliography, as approved by the major professor must be submitted. If all credentials and proposals are acceptable, the student is advanced to candidacy; and a guidance and examining committee of not less than three members is named by the Graduate Council.

Thesis The student is required to pursue a problem in basic or clinical research, the results of which are presented in thesis form according to standards set by the Graduate Council. Oral defense of the thesis may be required.

General requirements For information about requirements and practices to which all graduate students are subject, the student should consult the *Academic Practices* section of division I of the Graduate School BULLETIN.

ENDODONTICS

The goal of the graduate program in endodontics is to prepare by education and experience dentists who are eligible for certification as specialists in this area of dentistry. The course has been designed (1) to provide a comprehensive study of the biomedical sciences, with emphasis on their relationships to endodontics; (2) to provide advanced competency in the clinical practice of both the usual and the unusual endodontic procedures; and (3) to provide training in research and teaching so as to encourage continued growth and involvement after completion of the program. A minimum of two years of general practice experience before applying is required.

Two programs are available. The certificate program requires a minimum of twenty-two months in residence, beginning in September. Master's degree programs require a minimum of twenty-four months in residence and may require additional time, depending on the major interest area. Both programs fulfill the requirements for eligibility for certification by the American Board of Endodontics.

Required courses

ENDN	534	Endodontic Treatment Conference
ENDN	601	Principles of Endodontics
ENDN	604	Literature Seminar in Endodontics
ENDN	625	Clinical Practice in Endodontics
ENDN	654	Practice Teaching in Endodontics
ENDN	697	Research
ENDN	698	Thesis
GRDN	509	General Statistics
GRDN	531	Applied Surgical Anatomy
GRDN	601	Practice Management
GRDN	604	Topics in Medicine and Hospital Protocol
GRDN	607	General Research Methods
GRDN	609	Professional Ethics
ORBI	522	Cell Biology
ORBI	526	Microbiology
ORBI	527	Immunopathology
ORBI	531	Physiology of Bone
ORPA	531	Clinical Oral Pathology
ORPA	533	Radiology
RLGN	___	Religion

ORAL AND MAXILLOFACIAL SURGERY

The graduate resident program in oral and maxillofacial surgery is designed to prepare the student for the practice of this surgical specialty and to provide the foundation for the continued acquisition of knowledge and skills. Clinical surgical health-care delivery is emphasized. The student is introduced to problems of research and teaching to develop an increased awareness of the profession. The content of the program is designed to conform to the standards outlined by the oral and maxillofacial surgery specialty board.

A minimum of three calendar years in residence is required, with the beginning date of July 1.

Required courses

ANES	521	Principles of Medicine, Physical Diagnosis, and Hospital Protocol
ANES	546	General Anesthesia
GRDN	531	Applied Surgical Anatomy
GRDN	601	Practice Management
GRDN	607	General Research Methods
ORBI	531	Physiology of Bone
ORDN	521	Applied Cephalometrics for Oral and Maxillofacial Surgeons
ORPA	531	Clinical Oral Pathology
ORSR	531	Oral and Maxillofacial Surgery I
ORSR	532	Oral and Maxillofacial Surgery II
ORSR	533	Oral and Maxillofacial Surgery III
ORSR	604	Literature Review in Oral and Maxillofacial Surgery
ORSR	641	Applied Orthognathic Surgery
ORSR	654	Practice Teaching in Oral and Maxillofacial Surgery
ORSR	697	Research
ORSR	698	Thesis
RLGN	___	Religion

ORTHODONTICS

The graduate program in orthodontics is organized to do the following: (1) develop technical competence in the skills of orthodontics, (2) deepen understanding of the basic natural sciences and their correlation with orthodontic practices, (3) develop analytical thinking, (4) develop skills in clinical research, (5) increase the sense of responsibility toward the patient and the community, and (6) develop increased awareness of obligation to make contributions to the growth and stature of the profession and to coordinate with those of allied professional disciplines. All of the foregoing are designed to prepare the student for a specialty practice in orthodontics or for pursuing a teaching career. The content of the program conforms to the standards outlined by the specialty board.

Two programs are available:

1. The certificate program requires a minimum of twenty-four months in residence, beginning in June.

2. Master's degree programs require a minimum of twenty-four months in residence, beginning in June. Specific programs may require additional time, depending on the research selected.

Required courses

GRDN	509	General Statistics
GRDN	524	Social Dynamics of Dental Practice
GRDN	526	Applied Anatomy
GRDN	601	Practice Management
GRDN	607	General Research Methods
GRDN	609	Professional Ethics
ORBI	522	Cell Biology
ORBI	531	Physiology of Bone
ORDN	521	Applied Cephalometrics for Oral and Maxillofacial Surgeons
ORDN	524	Introduction to Graduate Orthodontics, Lecture
ORDN	524L	Introduction to Graduate Orthodontics, Laboratory
ORDN	525	Materials Science and Mechanics
ORDN	527	Clinical Photography
ORDN	535	Advanced Cephalometrics
ORDN	536	Concepts of Physical Anthropology
ORDN	545	Growth and Development
ORDN	546	Fundamentals of Occlusion
ORDN	554	Physiology and Pathology of Speech
ORDN	571	Diagnosis and Treatment Planning I
ORDN	574	Diagnosis and Treatment Planning II
ORDN	584	Current Orthodontic Literature I
ORDN	591	Current Orthodontic Literature II
ORDN	597	Current Orthodontic Literature III
ORDN	604	Seminar in Orthodontics
ORDN	605	Advanced Seminar in Orthodontics
ORDN	606	Craniofacial Genetics
ORDN	607	Advanced Physiology and Pathology of Speech
ORDN	609	Temporomandibular Joint Diagnosis and Treatment
ORDN	625	Clinical Practice in Orthodontics
ORDN	634	Orthodontic Clinical Conference
ORDN	635	Finishing Mechanics
ORDN	655	Temporomandibular Function and Dysfunction
ORDN	697	Research
ORDN	698	Thesis
ORPA	531	Clinical Oral Pathology
ORSR	641	Applied Orthognathic Surgery
RLGN	___	Religion

PERIODONTICS

The graduate program in periodontics leads to a certificate, or a Master of Science degree combined with a certificate,

The two-year certificate program prepares the student for a specialty practice in periodontics and provides the basis for continuing professional development after completion of the program. The program includes didactic and clinical components as well as research opportunities.

The three-year Master of Science program includes the didactic and clinical work for the certificate program. In addition the residents have the opportunity to complete one or more research projects and to be involved in clinical and didactic undergraduate teaching activities. The Master of Science program prepares the residents for academic careers in periodontal research and teaching.

These programs fulfill the requirements for eligibility for certification by the American Board of Periodontology. A minimum of twenty-four months in residence is required for the certificate program, beginning in the summer quarter. The Master of Science degree requires an additional twelve months.

Required courses

GRDN	509	General Statistics
GRDN	526	Applied Anatomy
GRDN	604	Topics in Medicine and Hospital Protocol
GRDN	607	General Research Methods
ORBI	522	Cell Biology
ORBI	526	Microbiology
ORBI	527	Immunopathology
ORBI	531	Physiology of Bone
ORPA	531	Clinical Oral Pathology
ORPA	533	Radiology
PERI	524	The Periodontium
PERI	531	Periodontal Pathology
PERI	601	Periodontal Therapy
PERI	604	Current Periodontal Literature
PERI	611	Introduction to Periodontics
PERI	625	Clinical Practice in Periodontics
PERI	634	Clinical Conference
PERI	654	Practice Teaching in Periodontics
PERI	697	Research
PERI	698	Thesis
RLGN	____	Religion

CORE COURSES

ANES 521 Principles of Medicine, Physical Diagnosis, and Hospital Protocol (2)
Study of methods of recognizing normal and abnormal physical conditions in order to develop the dentist's general medical knowledge. Attention given to blood diseases, systemic diseases, and cardiac disturbances. Patient admission, physical, orders, and discharge.

GRDN 509 General Statistics (3)

GRDN 524 Social Dynamics of Dental Practice (2)
Current theories and principles in psychology related to learning and teaching, personality development and change, interpersonal process and dynamics, and how these principles apply to a dental specialty practice.

GRDN 526 Applied Anatomy (2)
Fundamentals of anatomy as they apply to a special region or application.

GRDN 531 Applied Surgical Anatomy (2)
Surgical approach to anatomy as it relates to special anatomic regions.

GRDN 601 Practice Management (2)
Designed to prepare the student for specialty practice, concepts of employment, records, incorporation, insurance, and practice planning.

GRDN 604 Topics in Medicine and Hospital Protocol
Topics presented in internal medicine and physical evaluation, with emphasis on diseases and physical conditions relating to dental treatment. Overview given on hospital utilization and local anesthesia; inhalation and intravenous sedation techniques reviewed.

GRDN 607 General Research Methods (3)
A survey of scientific methodology. Its development, rationale, and the necessity for its rigorous rules. How to develop, design, and report research in the health sciences.

GRDN 609 Professional Ethics (2)
Designed to provide students with a theological and philosophical framework for professional ethics. Topics include individual rights, autonomy, informed consent, and responsibilities of the professional person in the dental field, as well as in society as a whole.

ORBI 522 Cell Biology (3)
Presentation of a unified description of cellular structures and function as a core of current knowledge upon which the student will build new facts and concepts as they become available.

ORBI 526 Microbiology (2)
Principles of microbiology, with emphasis on the occurrence, taxonomy, cytology, staining, and physical properties of oral microorganisms. Fundamental aspects of virus-host relationships. Review of sterilization and disinfection procedures relative to dental therapy.

ORBI 527 Immunopathology (2)
Fundamental aspects of immunology and immunological reactions, with special considerations to transplantation, hypersensitivity, and immunopathology.

ORBI 531 Physiology of Bone (2)
A specialized presentation of bone healing, mechanisms of mineralization and resorption, growth and development.

ORBI 534 Special Topics in Oral Biology (arranged)
Various topics presented where appropriate needs are identified.

ORPA 531 Clinical Oral Pathology (2, 2)
Emphasis on oral manifestations of disease. Diagnosis, prognosis, and treatment of various oral neoplasms.

ORPA 533 Radiology (2)
Utilization of the physical nature of x-rays to better understand image production, biological effects of x-rays, radiation safety, application of principles of radiographic techniques. Risk estimation and radiographic interpretation.

DEPARTMENTAL COURSES

ENDODONTICS

ENDN 534 Endodontic Treatment Conference (2, 2, 2)
Designed to evaluate and discuss endodontic treatment cases, with an effort to integrate the treatment plan, the endodontic procedure, the total oral health, and the patient's physical status. Clinical conferences scheduled in oral pathology.

ENDN 601 Principles of Endodontics (2, 2, 2)
A comprehensive study of all aspects of clinical endodontics.

ENDN 604 Literature Seminar in Endodontics (2, 2, 2)
A review of the literature pertaining to the philosophy, teaching, and practice of endodontics.

ENDN 625 Clinical Practice in Endodontics (1000-1200 clock hours)
Clinical endodontics practice, which includes all aspects of the scope of endodontics. Emphasis placed on providing experience in treating endodontic cases which are considered of complex nature.

ENDN 654 Practice Teaching in Endodontics (1, 1)
Supervised teaching in the endodontic preclinical laboratory and predoctoral clinic. Lectures and table clinics included in the program.

ENDN 697 Research (arranged)

ENDN 698 Thesis (arranged)

ORAL AND MAXILLOFACIAL SURGERY

ORSR 531 Oral and Maxillofacial Surgery I (first year of residence) (arranged)
The principles of exodontics and the evaluation of oral disease. Minor oral surgery procedures studied, outlined, and performed under local anesthesia and intravenous sedation. Introduction to ambulatory general anesthesia. Treatment of emergencies in oral surgery practice. Introduction to hospital procedures, assisting on staff hospital cases, and attendance at specified seminars, conferences, and special lectures in the Medical Center.

ORSR 532 Oral and Maxillofacial Surgery II (second year of residence) (arranged)
Participation as assistant in major oral surgery procedure. Practice of hospital procedures, treatment of the hospitalized patient, diagnosis and treatment of fractures of the facial bones, continuation of the training in ambulatory general anesthesia for oral surgery. Rotation to other medical and surgical services in the Medical Center. Attendance at specified seminars, conferences, and special lectures in the Medical Center.

ORSR 533 Oral and Maxillofacial Surgery III (third year of residence) (arranged)
Treatment of complicated fractures of the facial bones, reconstructive maxillofacial surgery, surgical orthognathic correction, and treatment of developmental or acquired deformities of the jaws. Preprosthetic surgery, osseous grafting of postresection and posttraumatic maxillofacial defects. Study of the application of general anesthesia to ambulatory outpatient oral surgery patients. Training in assuming full responsibility for all aspects of oral surgery practice.

ORSR 604 Literature Review in Oral and Maxillofacial Surgery (1)
Critical review of present and past literature dealing with pertinent oral and maxillofacial surgical problems.

ORSR 641 Applied Orthognathic Surgery (1, 1, 1, 1, 1, 1, 1)
A seminar course emphasizing preoperative diagnosis, planning, intraoperative procedures, and postoperative care of orthognathic patients. Descriptions of congenital and developmental deformities and emphasis on all aspects of patient management.

ORSR 654 Practice Teaching in Oral and Maxillofacial Surgery (2)

ORSR 697 Research (arranged)

ORSR 698 Thesis (arranged)

ORTHODONTICS

ORDN 521 Applied Cephalometrics for Oral and Maxillofacial Surgeons (2)
Projection analyses, preoperative diagnosis, and planning of treatment of malocclusion through cephalometric review. Cephalometric diagnosis and follow up of postsurgical and postorthodontic treatment.

ORDN 524 Introduction to Graduate Orthodontics (12)
Outline of the principles of appliance design, the application of forces to produce tooth movement, and the tissue response to such forces. Lecture-laboratory. Overview of orthodontics to prepare the student for clinical practice of orthodontics. Diagnosis and treatment planning, including cephalometrics. Growth forecasting and preparation of visual treatment objectives.

ORDN 524L Introduction to Graduate Orthodontics, Laboratory (6)
Selected laboratory projects to enhance the didactic portion of the course.

ORDN 525 Materials Science and Mechanics (2)
Structure and properties of materials used in orthodontics. Analysis of the effects of mechanical and heat treatments. Survey of strength and mechanics in force delivery.

ORDN 527 Clinical Photography (1)
Clinical proficiency in intra-oral and extra-oral photography. Discussion and use of photographic equipment and techniques on orthodontic patients. Camera, lens, and flash required.

ORDN 535 Advanced Cephalometrics (2)
Construction of progress cephalometric tracings and use of superimposition to evaluate and revise treatment plan; students' presentation and evaluation of the progress of their clinical patients

ORDN 536 Concepts of Physical Anthropology (2)
Basic and classic concepts of physical anthropology as they relate to orthodontics.

ORDN 545 Growth and Development (2)
Principles of growth and development from the subcellular to the tissue level. Emphasis on myogenesis and osteogenesis. Prenatal and postnatal development of the face and jaws, including the classic concepts of facial growth. Consideration of general growth, with the goal of developing ability to recognize abnormal signs, observe variations, diagnose pathological conditions, know the normal, predict height, and use various standards to assess growth and development.

ORDN 546 Fundamentals of Occlusion (2)
The development of the human face and dentition. A concept of dynamic functioning occlusion.

ORDN 554 Physiology and Pathology of Speech (2)
A seminar course in which the literature pertaining to tongue thrust, swallowing, and related problems is considered. Problems and treatment discussed by speech therapists.

ORDN 571 Diagnosis and Treatment Planning I (2)
Diagnosis and treatment of assigned patients; minimum of four patients with major dentofacial handicaps.

ORDN 574 Diagnosis and Treatment Planning II (2)
Fundamental aspects of diagnosis and treatment planning of conventional and bizarre malocclusions.

ORDN 584 Current Orthodontics Literature I (2)
Presentation of current papers in various disciplines of orthodontics.

ORDN 591 Current Orthodontics Literature II (2)
Presentation of current papers in various disciplines of orthodontics.

ORDN 597 Orthognathic Surgery Theory and Literature Review (2)
Presentation of current papers in various disciplines of orthodontics, with primary emphasis on surgical orthodontics.

ORDN 604 Seminar in Orthodontics (1, 1, 1)
A critical review of suggested etiological factors of malocclusion. Problems of diagnosis and the rationale of various treatment philosophies. Liberal use of current literature. Discussions by guest lecturers with demonstrated competence in the field.

ORDN 605 Advanced Seminar in Orthodontics (1, 1, 1, 1)
Second-year seminar: design of clinical diagnosis, practice management.

ORDN 606 Craniofacial Genetics (2)
Basic genetics; introduction to craniofacial clinic.

ORDN 607 Advanced Physiology and Pathology of Speech (1)
Concentration and in-depth study of specific areas of oral myofunctional disorders which influence the occlusion.

ORDN 609 Temporomandibular Joint Diagnosis and Treatment (1)
Temporomandibular joint diagnosis and treatment planning, and fabrication of treatment appliances.

ORDN 625 Clinical Practice in Orthodontics (1400 clock hours)
Diagnosis and treatment of twenty-five assigned patients; minimum of four patients with major dental-facial handicaps.

ORDN 634 Orthodontics Clinical Conference (2)
Preparation and presentation of the diagnosis, case analysis, and treatment plans for patients under care.

ORDN 635 Finishing Mechanics (2)
Orthodontic treatment modalities with emphasis on finishing mechanics for the patient.

ORDN 655 Temporomandibular Function and Dysfunction
The temporomandibular joint in function and dysfunction, in health and disease. Diagnosis, treatment planning, and treatment of the temporomandibular joint, with emphasis on the integration of orthodontics and temporomandibular joint treatment.

ORDN 697 Research (arranged)

ORDN 698 Thesis (arranged)

PERI 524 The Periodontium (2)
Review of the literature concerning the anatomy (macro-, micro-, and ultrastructural) and the physiology of the periodontal tissues.

PERI 531 Periodontal Pathology (2)
Study of the specific scientific literature which forms the basis for current concepts on histopathology of periodontal diseases and periodontal wound healing.
Must be repeated for a total of 10 units.

PERI 601 Periodontal Therapy (2)
Study of the literature which forms the basis for current concepts of the treatment of periodontal diseases. Must be repeated for a total of 12 units.

PERI 604 Current Periodontal Literature (2)
Review of papers in the most recent issues of periodontal scientific journals.
Must be repeated for a total of 16 units.

PERI 611 Introduction to Periodontics (2)
Overview of the clinical science of periodontics, including epidemiology, etiology, therapy, clinical methods, and record keeping.

PERI 625 Clinical Practice in Periodontics (1500 or 2002 clock hours)
Clinical experience in the diagnosis and treatment of periodontal diseases.
The two-year program requires 1500 clock hours; the three-year program requires 2002 clock hours.

PERI 634 Clinical Conference (1)
Case management conferences with interdisciplinary faculty input to assist the student in diagnosis, treatment planning, and the management of patients.
Must be repeated for a total of 6 units.

PERI 654 Practice Teaching in Periodontics (1)
Experience in teaching the undergraduate dentistry student.
Must be repeated for a total of 4 units.

PERI 697 Research (arranged)

PERI 698 Thesis (arranged)

ENGLISH

FACULTY

ROBERT P. DUNN, PH.D. University of Wisconsin 1970
Chairman; Professor of English
English renaissance, religion and literature

DOROTHY M. COMM, PH.D. University of Alberta 1971
Professor of English
Eighteenth-century and world literature, writing

OPAL I. HAGELGANTZ, ED.D. University of Nebraska 1969
Professor of English
Nineteenth-century literature, grammar and composition

FRANK KNITTEL, PH.D. University of Colorado 1960
Professor of English
Medieval literature, twentieth-century literature

MARILYN C. TEELE, M.ED. Boston University 1961
Professor of English
Reading and composition theory

JUDY M. LAUE, PH.D. University of Southern California 1988
Assistant Professor of English
American literature

KENNETH E. MATTHEWS, PH.D. University of California, Los Angeles 1983
Assistant Professor of English
Twentieth-century literature and writing

EMERITUS PROFESSORS

RICHARD B. LEWIS, PH.D. Stanford University 1949
Emeritus Professor of English
English renaissance and literary criticism

HELEN F. LITTLE, M.A. University of Nebraska 1938
Emeritus Professor of English

J. PAUL STAUFFER, PH.D. Harvard University 1952
Emeritus Professor of English
Nineteenth-century literature

The purposes of the Master of Arts degree graduate programs in English are to increase the student's resources and equipment for teaching, writing, and exploration in the areas of specialty; to help perfect research skills; and to expand interests and information in the literature and culture of Western civilization.

The student who is preparing to teach in California should consult the credentials adviser in the School of Education for guidance in qualifying for a California Standard Teaching Credential.

DEGREE REQUIREMENTS

Acceptance Students are encouraged to present a baccalaureate degree with a major (or the equivalent) in English from an accredited college. However, other students will be accepted who give promise through outstanding transcripts, recommendations, and GRE scores of doing exceptional work in English language and literature. Students who present less than a full major in English should expect to work longer for the degree. Indeed, for each student, a personal plan of study will be designed that takes into account previous collegiate experience and career goals (see "programs"). Each student's study plan, when combined with the undergraduate English major, should meet the following basic requirements by the time graduate courses have been completed:

1 course in literary criticism
2 courses in major authors (one to be Chaucer, Shakespeare, or Milton)
1 course in religion and literature
1 course in the Bible as literature
1 graduate sequence in bibliography and research
5 period courses in English literature (or substitute up to two genre courses in English literature for up to two period courses)
2 courses in American literature
1 course in world or classical literature
2 courses in language or linguistics
2 advanced writing courses (above the freshman level)
4 units in compositional theory and the teaching of writing

Many of these courses will have been taken as part of the student's baccalaureate program; a student's graduate program will make up any deficiencies as well as meet individual interests and professional goals.

Residency A minimum of three quarters in residence is required of all graduate students in English.

Diagnostic examination During the first term of enrollment, each student will take a diagnostic examination. The results of this examination, together with the student's undergraduate records and test scores, will be used by the adviser or guidance committee in planning the student's overall program.

Total units A minimum of 44 units is required for graduation. At least 36 units must be in English, with no less than 24 units in courses above the 500 level.

Required courses Each student must take the following courses:

ENGL 504 Methods and Materials of Literary Study (2)
ENGL 697 Research (2)
RLGN ____ Religion (3 units at the 500 or 600 level)

Programs Program A is the traditional master's program for a student desiring to work after graduation toward the doctoral degree in English or for the student who wants maximum preparation in the areas of English and American literature.

Program B is for the student who wishes to emphasize the teaching of reading or composition/rhetoric or linguistics on the primary or secondary level, but who also wishes a background in literature. The student will take a minimum of 16 units in the area of specialization (for example, reading) and will have the following basic requirements waived: one course in a major author and two period courses in literature.

Foreign language Each student must demonstrate reading competency in Spanish, French, German, Latin, or another language approved by the department. Competency may be demonstrated by an academic transcript indicating that courses have been taken through the intermediate level in college or by a proficiency examination administered by the Department of Modern Languages.

Final requirements At the end of the program, the student will either write a comprehensive examination over English and American Literature and over all graduate English courses taken; or write a thesis, project, or publishable paper.

General requirements For information about requirements and practices to which all graduate students are subject, the student should consult the *Academic Practices* section of division I of the Graduate School BULLETIN.

Teaching assistantship Unless a student is currently teaching full time, (s)he is normally required to participate in the teaching assistantship plan. A stipend/scholarship is provided.

COURSES

UPPER DIVISION COURSES APPLICABLE TO GRADUATE PROGRAM

ENGL 405 Creative Writing (4)

ENGL 415 Literature for Children (4)

ENGL 416 Young Adult Literature (4)

ENGL 417 Knowledge and Skills in Literature (4)

ENGL 425 Major American Authors or Movements (4)

ENGL 428 Romantic Literature (4)

ENGL 429 Victorian Literature (4)

ENGL 434 Old and Middle English Literature (4)
Offered alternate years.

ENGL 435 English Renaissance Literature (4)
Offered alternate years.

ENGL 436 Restoration and Eighteenth-Century Literature (4)
Offered alternate years.

ENGL 438 Twentieth-Century English Literature (4)

ENGL 445 Biblical Literature (4)

ENGL 457 Chaucer (4)
Offered alternate years.

ENGL 458 Shakespeare (4)
Offered alternate years.

ENGL 459 Milton (4)
Offered alternate years.

ENGL 475 History of the English Language (4)
Offered alternate years.

ENGL 477 General Linguistics

ENGL 489 Religion and Literature (4)
Offered alternate years.

ENGL 499 Directed Study (1-4)

GRADUATE COURSES

ENGL 504 Methods and Materials of Literary Study (2)
Required of all degree candidates.

ENGL 506 Composition and Rhetorical Theory (4)

ENGL 507 Diagnosis and Remediation in Reading (4)

ENGL 508 Practicum in Reading (2, 2)
Required of reading teaching assistants. May be repeated once for credit.

ENGL 509 Scholarly Writing (2)
The theory and practice of expository and persuasive writing, emphasizing the construction and style of research papers and theses. Not applicable toward a master's degree in English.

ENGL 515 Workshop (1-4)
Varied content offered in concentrated courses for special groups (such as Shakespeare on film, C. S. Lewis in the secondary classroom, humor in American literature). May be repeated as long as content is not duplicated.

ENGL 575 **Problems in English Language and Linguistics (4)**

Graduate seminar content varies according to the specialization and research interest of the teacher. The course schedule and the student's transcript indicate the specific area of study. For example, Seminar in a Major Author: Johnson; or Seminar in a Literary Genre: Poetry. Seminars may be repeated with new content for additional credit. A seminar typically carries 4 units of credit unless otherwise noted in the course schedule. Occasionally a seminar extends over two terms for 5 units of credit.

ENGL 615 **Seminar in Literary History and Criticism (4-5)**

ENGL 625 **Seminar in a Major Literary Period (4-5)**

ENGL 635 **Seminar in a Major Author (4-5)**

ENGL 645 **Seminar in Religion and Literature (4-5)**

ENGL 665 **Seminar in Writing (4-5)**

ENGL 675 **Directed Study (1-4)**

ENGL 697 **Research (1-4)**
Required of all degree candidates.

ENGL 698 **Thesis (1-8)**

FAMILY LIFE EDUCATION

FACULTY

IAN P. CHAND, PH.D., Pennsylvania State University 1980
Program Coordinator; Professor of Sociology and Family Studies
Family life education, marriage and family therapy

ANTONIUS D. BRANDON, PH.D. United States International University 1980
Chairman; Professor of Marriage and Family Therapy
Marriage and family therapy, crisis intervention; AAMFT-approved supervisor

WON K. YOON, PH.D. Louisiana State University 1976
Professor of Sociology
Social theory, ethnic relations, methodology

MARY MOLINE, PH.D. Brigham Young University 1979
Associate Professor of Marriage and Family Therapy
Marriage and family therapy; AAMFT-approved supervisor

RONALD G. HUSTON, PH.D. United States International University 1981
Assistant Professor of Marriage and Family Therapy
Marriage and family therapy, child and adolescent therapy

ASSOCIATE FACULTY

JOHN W. ELICK, PH.D. University of California, Los Angeles 1969
Emeritus Professor of Anthropology; Curator, Anthropological Museum

ANEES A. HADDAD, PH.D. University of Southern California 1971
Professor of Sociology and Family Studies (on leave; Dean, College of Arts and Sciences)
Family sociology, human sexuality

Family life education is an interdisciplinary program leading to a Master of Arts degree or a certificate in family life education. The Master of Arts degree program trains individuals at the postbaccalaureate level in an understanding of the structure and functioning of the family as a social institution; and to develop, implement, and evaluate family life programs for the community, churches, and schools. In addition to providing church- and school-related job opportunities, this training prepares students for employment as community family agency administrators, Headstart administrators, extension specialists, family service and life researchers, family specialists, human development specialists, administrative assistants for community relations, community services representatives, probation advisers, social service workers, mental health workers, vocational counselors, and volunteer services coordinators.

The certificate program in family life education is designed for those who wish to acquire training but do not seek the Master of Arts degree. Ministers, teachers, school counselors, social services workers, and others who wish to become family life educators are attracted to the certificate program.

Both the Master of Arts degree program and the certificate program in family life education meet all the requirements of the National Council on Family Relations for certification as family life educator.

Prerequisite A statistics course is required for degree but not certificate admission.

Degree requirements Essential to fulfill the requirements for the Master of Arts degree are:

1. A minimum of 48 units of graduate credit in family life education, as outlined in this BULLETIN.
2. Satisfactory performance on a written comprehensive examination, or the completion of a thesis.

General requirements For information about requirements and practices to which all graduate students are subject, the student should consult the *Academic Practices* section of division I of the Graduate School BULLETIN.

Certificate requirements Requirements for the program include:

1. Completion of at least an undergraduate degree or its equivalent for admission.
2. A minimum of 27 units of graduate credit in family life education, as outlined in this BULLETIN.

For information about requirements and practices to which all graduate students are subject, the student should consult the Academic Practices section of division I of this BULLETIN.

COURSES FOR MASTER OF ARTS PROGRAM

CORE REQUIREMENTS (19 units)

FMED	505	Social Research Methods I (2)
FMED	506	Social Research Methods II (2)
FMED	514	The Family: Crosscultural Family Values (3)
FMED	614	Seminar in Family Communications (3)
MFAM	515	Crisis Intervention (2)
MFAM	614	Family Law and Ethics (2)
MFAM	656C	Advanced Human Growth and Development (2)
MFAM	669	Human Sexual Behavior (3)

FAMILY LIFE EDUCATION REQUIREMENTS (26 units)

FMED	528	Parenting (2)
FMED	529	Family Life Education (2)
FMED	577	Family Life Workshop (2)
FMED	695	Internship in Family Life Education (1)
FMED	698	Project or thesis (3)
MFAM	568	Group Theories in Marriage and Family Therapy (2)
SOCI	414	Sociology of the Family (3)
SOCI	444	Family Resource Management (3)
BUAD	513	Human Resource Management (4)
EDCI	430	Secondary School Curriculum and Instruction (4)

RELIGION REQUIREMENT (3 units)

COURSES FOR CERTIFICATE PROGRAM

FMED	514	The Family: Crosscultural Family Values (3)
FMED	528	Parenting (2)
FMED	529	Family Life Education (2)
FMED	614	Seminar in Family Communication (3)
FMED	695	Internship in Family Life Education (1)
MFAM	614	Family Law and Ethics (2)
MFAM	656C	Advanced Human Growth and Development (2)
MFAM	669	Human Sexual Behavior (3)
SOCI	414	Sociology of the Family (3)
SOCI	444	Family Resource Management (4)

GRADUATE COURSES

FMED 505 Social Research Methods (2)

Analysis of current social research methods. Practice in the use of techniques. Scientific method.
Prerequisite: An introductory course in statistics.

FMED 506 Advanced Social Research Methods (2)

Use of computer. Statistical analysis. Writing research report.
Prerequisite: FMED 505.

FMED 514 The Family: Crosscultural Values (3-4)

Systematic and comparative analysis of the American family and family systems of other cultures. Changing family patterns. The future of the family in an urbanizing world into the twenty-first century. The family as a value-maintaining and a value-transmitting institution. Crosscultural family counseling.

FMED 528 Parenting (2)

Principles and practices relating to parent-child relationships. Emphasis on family roles, communication, conflict resolution, value development, and parenting skill development.

FMED 529 Family Life Education (2)

Systematic comparative analysis of the historical development, theoretical perspectives, types of programs, and research in family life studies.

FMED 577 Family Life Workshop (2)

Focus on lay-counselor skills which may be used by ministers and teachers dealing with crisis situations and in preventing problems which affect the stability of family constellations.

FMED 614 Seminar in Family Communication (3-4)

Evaluation of current research on family communication, especially in the United States. Research project on some aspect of family structure or function. Styles of communication within the family unit (verbal and nonverbal), sources of communication pathology, methods of reestablishment of communication.

FMED 635 Single Adult in Family and Society (3)

Perceptions, needs, challenges, and opportunities during the periods of adult singleness in the life cycle.

FMED 694 Directed Reading (arranged) (1-3)

FMED 695 Internship in Family Life Education (1-3)

FMED 697 Research (1-6)

FMED 698 Project or Thesis (3)

SOCI 414 Sociology of the Family (4)
Structure and function of families, family theories and frames of reference, family life cycle, crosscultural families, family problems, and changing family patterns.

SOCI 444 Family Resource Management (4)
Principles of home management in relation to needs and resources of individuals and families.

BUAD 513 Human Resource Management (4)
A basic course relating to managerial decision making with respect to the acquisition, development, reward, and maintenance of human resources.

EDCI 430 Secondary School Curriculum and Instruction (4)
The relation of curriculum to classroom teaching. Selecting and organizing learning opportunities, identifying appropriate teaching strategies, organizing course outlines and unit plans, and writing clearly stated goals and objectives. Laboratory experiences in teaching and in the use of audiovisual material and equipment.

OTHER GRADUATE COURSES: ANTHROPOLOGY AND SOCIOLOGY

ANTH 506 Transcultural Health Care (3)
World health needs, health manpower, and sociocultural influences. Patterns of health care in relation to culture and economics of selected countries. Problems, health beliefs, and practices of United States ethnic groups compared. Identical to NRSG 506.

ANTH 534 Anthropology of Mission (3)
A study of mission, applying the findings of anthropology as they relate to cultural change. The process of religious development, the means of diffusion, the factors affecting religious acculturation, and the analysis from case studies of programs planned to direct changes in religion. Identical to RELM 534.

ANTH 626 Anthropological Linguistics (3)
Language in perception and cognition. Ethnographic research in linguistics domains as indicators of culturally determined cognitive ranges and emphases. Structural analysis of a selected language.

ANTH 648 Medical Anthropology (3)
Research in traditional medical systems (folk medicine, curanderismo, shamanism, etc.), folk psychiatry, ethno-pharmacognosy, dental anthropology.

SOCI 674 Seminar in Medical Sociology (3)
Medicine as a social institution. Research into various aspects of the medical community and its relation to society.

HISTORY

CLOSED TO ADMISSIONS, 1988-90.

FACULTY

DELMER G. ROSS, PH.D. University of California, Santa Barbara 1970
Chairman; Professor of History
Latin America

FREDERICK G. HOYT, PH.D. Claremont Graduate School 1963
Professor of History and Political Science
American history

PAUL J. LANDA, PH.D. Vanderbilt University 1976
Professor of Church History
Church history

DALTON D. BALDWIN, PH.D. Claremont Graduate School 1975
Associate Professor of Religion
Historical theology

T. RICHARD RICE, PH.D. University of Chicago Divinity School 1974
Associate Professor of Historical Theology
Historical theology

RONALD D. GRAYBILL, PH.D. Johns Hopkins University 1983
Assistant Professor of History
American History

ASSOCIATE FACULTY

V. NORSKOV OLSEN, PH.D. University of London 1966; DR.THEOL. University of Basel 1968
Professor of Church History
Church history

The principal purposes of the Master of Arts degree graduate program in history are to assist students in attaining the qualifications essential for teaching in secondary schools and colleges and to prepare some students for research, doctoral programs, and the pursuit of scholarly careers in history.

The applicant is normally expected to have a baccalaureate degree with a major in history from an accredited college. If the college record and test scores indicate any weaknesses or deficiencies, the student may be required to take additional compensatory undergraduate work.

Degree requirements The following are the requirements for the Master of Arts degree:

1. A minimum of three quarters in residence as a graduate student.
2. A minimum of 44 quarter units of graduate credit in history (at least 24 units must be in courses numbered above 500; 8 units may be transferred from an approved college or university; 8 units may be in an approved cognate area). HIST 504 Research Methods (2), ENGL 509 Scholarly Writing (2), and HIST 506 Historiography (4) are required.
3. Reading proficiency in a modern or classical foreign language.
4. A core of four courses (including a seminar and a reading tutorial) in the student's field of specialization.
5. After 38 units of courses, either a qualifying or a comprehensive examination:
   (a) A student who chooses to write a thesis will take a two-hour, written, general qualifying examination.
   (b) A student who chooses to submit a project — either a publishable paper or two revised and expanded graduate seminar papers — will take a three-hour written, general qualifying examination.
   (c) A student who chooses not to write a thesis or to submit a written project will take a two-part written comprehensive examination over all courses taken for the degree.

The student may emphasize American, European, or church history.

The student who is preparing to teach in California should consult the credentials adviser in the School of Education about a California Standard Teaching Credential.

For information about requirements and practices to which all graduate students are subject, the student should consult the *Academic Practices* section of division I of this BULLETIN.

UPPER DIVISION COURSES
APPLICABLE TO GRADUATE PROGRAM

HIST 407 The Scientific Revolution (4)

HIST 408 Modern Natural Science: Mechanisms for Change (4)

HIST 409 Sickness and Health in American Society (4)

HIST 416, 417, 418 Europe I, II, III (4, 4, 4)

HIST 428 Mexico (4)

HIST 455 Religion in American Life (3-4)

HIST 458 Western America (4)

HIST 459 California History (4)

HIST 466 The Early Christian Church (3-4)

HIST 468 History of the Papacy (3-4)

HIST 469 The Age of the Renaissance (3-4)

HIST 474 The Lutheran Reformation (3-4)

HIST 476 The Swiss Reformation and Calvinism (3-4)

HIST 478 The English Reformation (3-4)

HIST 485 History of Seventh-day Adventism (3-4)

HIST 486 Ellen G. White: Her Life and Thought (3-4)

HIST 487, 488 United States Constitution (4, 4)

HIST 494 History Colloquium (½)

HIST 495 Readings in History (1-6)

HIST 499 Directed Study (1-6)

GRADUATE COURSES

HIST 504 Research Methods in History (2)

HIST 506 Historiography (4)

HIST 555 Religion in American Life (3-4)
The place of religion in American intellectual, political, social, and cultural developments, from the Colonial period to the present. Identical to RELH 555.

HIST 566 The Early Christian Church (3-4)
Study from primary sources of the important men, developments, and ideas in the Christian Church from apostolic times through the fifth century A.D. Identical to RELH 566. Offered on demand.

HIST 568 History of the Papacy (3-4)
Historical and theological development of the Papacy and Roman Catholicism during patristic, medieval, and modern periods. Identical to RELH 568. Offered on demand.

HIST 569 The Age of the Renaissance (3-4)
Offered on demand.

HIST 574 The Lutheran Reformation (3-4)
A study of Martin Luther, his theology, and the Reformation movement he initiated, down to 1555. Identical to RELH 574. Offered alternate years.

HIST 576 The Swiss Reformation and Calvinism (3-4)

Leading men of the Swiss Reformation (Zwingli, Bullinger, Calvin, and Beza) and the theological and sociological influences of Calvinism. Identical to RELH 576. Offered alternate years.

HIST 578 The English Reformation (3-4)

Main historical forces and religious movements of the English Reformation until the Westminster Assembly. Identical to RELH 578. Offered alternate years.

HIST 585 History of Seventh-day Adventism (3-4)

Millerism and early Sabbath-keeping Adventism, anti-Catholicism, antislavery, and church-state relations. "Shut-door" theology and missionary expansion. Organization, 1888 and reorganization. Health and prohibition, education and evangelism. Origin and development of the Seventh-day Adventist denomination to the present. Identical to RELH 585.

HIST 586 Ellen G. White: Her Life and Thought (3-4)

A study of the key events in the life of Ellen G. White (1827-1915) and her major theological contribution. Identical to RELH 586.

HIST 634 Seminar in European History (4)

Offered on demand.

HIST 635 Seminar in Church History (4)

Identical to RELH 635. Offered alternate years.
Prerequisite: Consent of the instructor.

HIST 647 Seminar in American History (4)

Offered on demand.

HIST 694 Special Problems in History (directed individual study) (arranged)

HIST 697 Research (1-4)

HIST 698 Thesis (2)

MARRIAGE AND FAMILY THERAPY

FACULTY

MARY E. MOLINE, PH.D. Brigham Young University 1979
Program Coordinator; Associate Professor of Marriage and Family Therapy
Group therapy; AAMFT-approved supervisor

ANTONIUS D. BRANDON, PH.D. United States International University 1980
Chairman; Associate Professor of Marriage and Family Therapy
Marriage and family therapy, crisis intervention; AAMFT-approved supervisor

IAN P. CHAND, PH.D. Pennsylvania State University 1980
Program Coordinator of Family Life Education; Professor of Sociology and Family Studies
Sociology; marriage and family therapy

ANEES A. HADDAD, PH.D. University of Southern California 1971
Professor of Sociology and Family Studies (on leave; Dean, College of Arts and Sciences)
Family sociology, human sexuality

RONALD G. HUSTON, PH.D. United States International University 1981
Clinical and Fieldwork Coordinator; Assistant Professor of Marriage and Family Therapy
Clinical psychology, marriage and family therapy; AAMFT-approved supervisor

MICHELLE NADEN, M.S. Loma Linda University 1984
Assistant Professor of Marriage and Family Therapy
Sociology, marriage and family therapy

ASSOCIATE FACULTY

VERN ANDRESS, PH.D. United States International University 1976
Professor of Psychology
Psychology

ALBERTA MAZAT, M.S.W. University of Denver 1970
Professor of Marriage and Family Therapy
Marriage therapy, human sexuality; AAMFT-approved supervisor

PETER G. STRUTZ, PH.D. University of Alberta 1966
Professor of Psychology
Psychology

M. JERRY DAVIS, REL.D. School of Theology at Claremont 1967
Associate Professor of Religion and Pastoral Counseling
Religion and pastoral counseling; AAMFT-approved supervisor

Marriage and family therapy is an interdisciplinary program leading to the Master of Science degree. It is designed to give the student a broad academic background for understanding the individual, couple, or family and their problems and to prepare the graduate to assist individuals, couples, and families in working through their problems.

Marriage, family, and child therapy has been established in California by law as a profession requiring state licensure. Persons who desire to enter the profession must have the proper academic and clinical preparation and must pass the written and oral licensing examinations. Persons previously practicing as licensed marriage, family, and child therapists must update their credentials by approved continuing education programs. Other states than California have enacted or plan to enact similar legislation. The master's program at this University meets California licensing standards according to Business and Professions Code 3980.38 This code states that in order to provide an integrated course of study and appropriate professional training, while allowing for innovation and individuality in the education of marriage, family, and child counselors, this degree program must meet the educational qualifications for licensure and include all of the following.

1. Provide an integrated course of study that trains students generally in the diagnosis, assessment, prognosis, and treatment of mental disorders.
2. Prepare students to be familiar with the broad range of matters that may arise within marriage and family relationships.
3. Train students specifically in the application of marriage and family relationship counseling principles and methods.
4. Encourage students to develop those personal qualities that are intimately related to the counseling situation such as integrity, sensitivity, flexibility, insight, compassion, and personal presence.
5. Teach students a variety of effectice psychotherapeutic techniques and modalities that may be utilized to improve, restore, and maintain healthy individual, couple, and family relationships.

6. Permit an emphasis or specialization that may address any one or more of the unique and complex array of human problems, symptoms, and needs of Californians served by marriage, family, and child counselors.

7. Prepare students to be familiar with crosscultural mores and values, including a familiarity with the wide range of racial and ethnic backgrounds common among California's population, including, but not limited to Blacks, Hispanics, Asians, and Native Americans.

The American Association for Marriage and Family Therapy (AAMFT), with headquarters in Washington, D.C., functions on a national basis to ensure that academic and clinical training programs adhere to the standards of the profession. The program offered by this University is one of a small number of fully accredited programs nationwide.

In addition to preparing registrants for the master's degree, the program provides courses and clinical training for those who do some marriage or family counseling as part of their work (pastors and others in helping professions). Clinical supervision is also provided for those who have already earned master's degrees but need additional clinical time to qualify for the state licensing examination. Postgraduate supervision must have the approval of the internship coordinator.

Admission Applicants to the program must meet the Graduate School admission requirements outlined in this BULLETIN, give evidence of emotional stability and maturity, and have well-defined personal values in harmony with the Christian ethic.

In addition to completing the required application forms, providing character and academic references, and Graduate Record Examination (GRE) aptitude scores, the prospective student should also arrange for a personal interview with two of the program's staff.

Although no particular undergraduate major is specified as preparation for the marriage and family therapy program, undergraduate courses in each of the following are required: abnormal psychology, personality theories, and introductory statistics. A prerequisite course in interviewing and counseling is preferred for nonbehavioral science majors. Prerequisites can be waived depending upon the background of the entering student. In addition, the student is required to take an MMPI (Multi-Minnesota Personality Inventory) and have the results sent to the program.

Students can enter the program fall quarter or under special circumstances winter quarter. This program is both a full-time and a part-time program. Full-time students attend classes two days a week and fulfill clinic requirements on an arranged basis.

Special status Persons in the helping professions may arrange to take relevant courses and a limited amount of supervised counseling without

proceeding toward a degree. Before applying for nondegree status, students should discuss their needs with the program coordinator.

Degree requirements Requirements for the Master of Science degree include the following:

1. Residence of at least two academic years.
2. A minimum of 72 quarter units of graduate work, which includes credit received for core courses, electives, and one religion course.
3. Practicum in marriage and family counseling (minimum of 500 hours) inclusive of clinical training (MFAM 534, 634). A minimum of 250 hours must be specifically marital or family cases. Clinical training as defined by the Commission on Accreditation for Marriage and Family Therapy includes twelve continuous months in a clinical internship.
4. Successful completion of a written comprehensive examination (taken before advancement to candidacy) and an oral examination (taken at the end of the program).

Clinical services The program operates a marriage and family therapy clinic to provide counseling services to individuals, couples, and families, and to give opportunity for clinical practice for students and interns. This service is based in Griggs Hall. Part of the student's field experience and internship may be taken at other clinics in the Riverside, San Bernardino, and Orange County areas. Paid internships may be available.

General requirements For information about requirements and practices to which all graduate students are subject, the student should consult the *Academic Practices* section of division I of the Graduate School BULLETIN.

Clinical program The state of California requires 3,000 hours of supervised clinical practice over a minimum of two years for licensure in marriage, family, and child therapy. Students in the program can obtain a maximum of 1500 hours applicable to the California license requirements. Students planning to obtain the California license after conferral of the degree may arrange for an advanced internship. To do this under the direction of the faculty, the student should inquire about the advanced clinical program on an application form available from the coordinator's office.

Persons who have acceptable degrees but who need the clinical internship to qualify for licensure should arrange for an interview with the clinical coordinator before completing the application form.

Curriculum The following is a list of the required and elective courses which total 72 quarter units. There are nine major areas of study.

MARITAL AND FAMILY SYSTEMS (12 units)

MFAM 551 Marriage Therapy Theory and Practice I (3)
MFAM 552 Marriage Therapy Theory and Practice II (3)
MFAM 553 Family Systems Theory (3)
FMED 514 The Family: Crosscultural Family Values (3)

MARITAL AND FAMILY THERAPY (10 units)

MFAM 663 Brief Family Therapy (2)
MFAM 665 Structural Family Therapy (2)
MFAM 668 Group Process Theory and Procedure (3)
FMED 614 Seminar in Family Communication (3)

INDIVIDUAL DEVELOPMENT (8 units)

MFAM 556 Psychopathy and Diagnostic Procedures and Assessment (3)
MFAM 558 Advanced Human Growth and Development (2)
MFAM 669 Human Sexual Behavior (1-3 units)

PROFESSIONAL STUDIES (6 units)

MFAM 515 Crisis Intervention and Counseling and Psychotherapeutic Techniques (2)
MFAM 614 Family Law and Ethics (3)
MFAM 535 Case Presentation and Professional Studies (3)

SUPERVISED CLINICAL PRACTICE (15 units)

MFAM 534 Clinical Training (180 hours)
MFAM 535, 536, 537 Case Presentation Seminar (3, 2, 2)
MFAM 634 Advanced Clinical Training (320 hours)
MFAM 635, 636, 637 Case Presentation Seminar (2, 2, 2)

RESEARCH (4 units)

MFAM 501 Research Tools and Methodology in MFAM I (2)
MFAM 502 Research Tools and Methodology in MFAM II (2)

INDIVIDUAL/FAMILY ASSESSMENT AND TREATMENT (9 units minimum)

MFAM 584 Treatment of Child and Adolescent Problems (3)
MFAM 624 Psychological and Marital Assessment (2)
MFAM 638 Family Therapy and Chemical Abuse (1-2 units)
MFAM 644 Family Therapy and Child Abuse (1-2 units)

ELECTIVES

MFAM 554 Personality Assessment (2
MFAM 557 Family Life Workshop (2)
MFAM 605 Gestalt Therapy (2-4)
MFAM 657 Setting up a Private Practice in MFAM (2)
MFAM 664 Experiential Family Therapy (2)
MFAM 667 Marital and Dissolution Counseling (2-4 units)
MFAM 670 Seminar in Sex Therapy (2)
MFAM 671 Program Development (2)
MFAM 673 Family Life Cycle (2)
MFAM 675 Clinical Problems in Marriage and Family Therapy (2)
MFAM 694 Directed Study: Marriage and Family (2-4)
MFAM 695 Research Problems: Marriage and Family (2-4)

RELIGION (2 units minimum)

One religion course

COURSES

GRADUATE COURSES

MFAM 501 Research Tools and Methodology (2)

Current social research methods, practice in the use of techniques, consideration of the philosophy of scientific method, and familiarization with MFAM test instruments.

MFAM 502 Research Design and Methodology II (2)

Prerequisite: MFAM 501 or consent of the instructor.

MFAM 515 Crisis Intervention Counseling (2-4)

Theory, techniques, and practices of crisis intervention, with special attention to the development of the basic communication skills of counseling. Areas included which are intended to contribute to the development of a professional attitude and identity are: confidentiality, interprofessional cooperation, professional socialization and organization.

MFAM 534 Clinical Training (180 clock hours)

Supervised clinical counseling of individuals, couples, families, and children. At least one hour of individual supervision per week and two hours of case presentation seminar per week. Continuous registration for this portion of the clinical training until completion of 180 clock hours.

MFAM 535 Case Presentation and Professional Studies (3)

Formal presentation of ongoing individual, marital, and family cases by clinical interns. Taping, video playbacks, and verbatim reports with faculty and clinical peers. Exploration of the interfacing between MFCCs and other professionals. Examination of licensure procedures, applying to professional organizations (AAMFT, etc.), development of professional attitude and identity. Guest speakers.

MFAM 536, 537 Case Presentation Seminar (2, 2)

Formal presentation of ongoing individual, marital, and family cases by clinical interns. Taping, video playbacks, and verbatim reports with faculty and clinical peers. Examination and training in applied psychotherapeutic techniques, assessment, diagnosis, prognosis, and treatment of premarital, couple, family, and child relationships. Dysfunctional and functional aspects examined, including health promotion and illness prevention. Limited to students in clinical training.

MFAM 542 Professional Seminar (2)

Exploration of the interfacing between MFCCs and other professionals. Examination of licensure procedures, applying to professional organizations (AAMFT, etc.), development of professional attitude and identity. Guest speakers.

MFAM 551 Marital Therapy: Theory and Practice I (3)

Intensive study of the major methods and techniques in marriage and family counseling. Role play, peer counseling, and videotaped presentations employed to enhance counseling techniques. Introduction to systems approach to intervention.

MFAM 552 Marital Therapy: Theory and Practice II (3)

Counseling theories and practices within the framework of systems, dynamics of marital interaction and treatment strategy, problems at various stages of the marital cycle.

MFAM 553 Family Systems Theory (3)

A review of Bowen theory, theory of family systems, and an introduction to family psychotherapy as an outgrowth of the theory. Students will examine their own family of origin.

MFAM 554 Personality Assessment (2)

Personality assessment within the context of major assessment tools. Skills development in administration of a major battery of tests, interpretation of data, recording, and communication of conclusions.

MFAM 556 Psychopathology and Diagnostic Procedures and Assessment (3)

Recognition of psychopathology in a DSM III-R framework, discussion of relatedness to systems theory. Sources of help for clients with psychopathology or other symptoms. Methods of treatment, including techniques of referral and DSM III-R diagnosis.

MFAM 558 Advanced Human Growth and Development (2)

Human biological, psychological, and social development from birth to demise—including, but not limited to, childbirth, child rearing, childhood, adolescence, adulthood, marriage, divorce, blended families, stepparenting and geropsychology. Overview of concepts, theories, and research relevant to human development. Emphasis on development over the life span in the content of family interaction and its impact on family therapy.

MFAM 568 Group Theories in MFAM Therapy (3)

Major theoretical approaches surveyed include individual theories, marital groups, network and family therapy groups. Group laboratory experience provided where students apply theory to practice and develop group leadership skills.

MFAM 577 Family Life Workshop (2)

Focus on lay-counselor skills which may be used by ministers and teachers dealing with crisis situations and in preventing problems which affect the stability of family constellations. Available to MFAM students.

MFAM 584 Treatment of Child and Adolescent Problems (3)

The psychodynamics involved in child and adolescent problems with respect to the family relationship. Demonstration of a variety of counseling approaches to the treatment of children and adolescents.

MFAM 605 Gestalt Family Therapy (2-4)

The principles of Gestalt psychology and therapy; the relationship between the individual and the physical, emotional, societal, and spiritual environment. Group experience which permits the spiritual and affective aspects of Gestalt therapy to be expressed and integrated with systems theory.

MFAM 614 Family Law and Ethics (3)

Laws pertaining to the family: child welfare, separation, divorce, and financial aspects of family maintenance. Case management, referral procedures, professional and client interaction, ethical practices (AAMFT), ethical relations with other professions, legal responsibilities, liabilities, and confidentiality. Current legal patterns and trends in the mental health profession. Exploration between the practitioner's sense of self and human values and his or her professional behavior and ethics. In accordance with the California Business and Professional Code 4980.41.

MFAM 624 Psychological and Marital Assessment (2)

Application of psychological testing methods in the diagnostic assessment of individual and group behavioral dynamics as encountered in marriage and family counseling. Observations and/or laboratory experience.

MFAM 634 Advanced Clinical Training (320 clock hours)

Supervised clinical counseling of individuals, couples, families, and children. At least one hour of individual supervision per week and two hours of case presentation seminar per week. Continuous registration for this portion of the clinical training until completion of the 320 clock hours required.

MFAM 635, 636, 637 Case Presentation Seminar (2, 2, 2)

Formal presentation of ongoing individual, marital, and family cases by clinical interns. Taping, video playbacks, and verbatim reports with faculty and clinical peers. Limited to students enrolled in clinical training.

MFAM 638 Family Therapy and Chemical Abuse (1-2 units)

Current theories and treatment of chemical dependencies, emphasis on family therapy, assessment techniques, understanding of how chemicals affect the mental and biological systems.

MFAM 644 Family Therapy and Child Abuse (1-2 units)

Definition of physical and emotional abuse, neglect, sexual molestation, and their incidence; family dynamics, offender and non-offender characteristics; treatment of children, adolescents, the family, and adults abused as children; treatment modalities including individual, group, and family therapy, ethical and legal issues, referral sources, assessment, interview techniques, and confidentiality. Minimum of 20 contact hours. In accordance with the California Business and Professional Code 4980.41(b).

MFAM 656 Seminar in Family Therapy (2)
Family therapy theories and methods, problems and case studies in family life, role playing, and peer counseling.

MFAM 657 Starting Private Practice in Family Therapy (2)
The legal, ethical, and economic aspects of developing and maintaining a private practice. Development of professional attitude and identity of professional organization such as AAMFT.

MFAM 663 Brief Family Therapy (2)
Examines the area of brief therapy in general and forms of brief family therapy in particular. In-depth study made of brief therapy.

MFAM 664 Experiential Family Therapy (2)
Examination of various experiential family theories. Laboratory experience included.

MFAM 665 Structural Family Therapy (2)
Designed to enhance observational, conceptual, planning, and intervention skills; increase ability to understand verbal and nonverbal communication; and broaden understanding of structural family therapy.

MFAM 667 Dissolution Counseling (2-4)
Methods of assessing and treating marital and divorce cases. Stages of divorce, referral sources, communication and systems techniques.

MFAM 669 Human Sexual Behavior (1-4 units)
Sexuality in contemporary society from the sociopsychological viewpoint. Anatomy and physiology of human sexuality: reproduction, normal and abnormal sexual response, psychosexual development, human fertility, human sexual dysfunction, integration of systems theory. A minimum of 40 contact hours.

MFAM 670 Seminar in Sexual Therapy (2)
Discussion of the major male and female sexual dysfunctions, therapeutic processes of treatment.
Prerequisite: MFAM 669.

MFAM 671 Program Development in Relationship Enrichment (2)
Experience in development and implementation of workshops, seminars, and classes appropriate to marriage, child, and family issues; experience in how to finance programs with grants and other financial assistance.

MFAM 672 Practicum in Relationship Enrichment (2)
Experience in organization and leadership in relationship enrichment groups.
Prerequisite: MFAM 671.

MFAM 673 Family Life Cycle Development (2)
Processes and tasks that individuals experience throughout family life, from conception to demise; presented as phase oriented and phase specific.

MFAM 675 Clinical Problems in MFAM Therapy (2)
An intensive, clinically focused course using videotape, live interview, and role playing. Marriage and family counseling methods observed and applied to problems representative of clinical practice.

MFAM 694 Directed Study: Marriage and Family (2-4)
Individual study in areas of special interest concerning the family and its problems. May be repeated for credit at the discretion of the faculty.

MFAM 695 Research Problems: Marriage and Family (2-6)
Directed research in the student's special field of interest in the family.
Prerequisite: MFAM 504 or concurrent registration with the consent of the coordinator.

MFAM 744 Clinical Internship (2-4)
Supervised clinical counseling of individuals, couples, families, and children. At least one hour of individual supervision per week. Postgraduates only. Approved by internship coordinator.

FMED 514 The Family: Crosscultural Family Values (3)

Structure and function, changing patterns, future in urban society. Relationship of changes in society to widespread family problems. Familiarity with wide range of social and ethnic backgrounds, but not limited to: Blacks, Hispanics, Asians, and Native Americans.

FMED 614 Seminar in Family Communication (3)

The theoretical foundations of human communication; the therapeutic techniques of major communication theorists in marital and family therapy.

MEDICAL SCIENTIST PROGRAM

ROBERT J. BOUCEK, M.D., **Codirector**
W. BARTON RIPPON, PH.D., **Codirector**

Faculty active in this program come from among the biomedical sciences graduate programs of the school from clinical departments in the School of Medicine at Loma Linda University, and from research laboratories of and beyond Loma Linda University.

The Medical Scientist Program comprises an integration of the M.D. with the M.S. or Ph.D. degrees. The foundation is a sequence of study in cell and molecular biology, which integrates basic biomedical science knowledge within the context of the cell. Through parallel correlative seminars, this basic material is expanded to include organ systems and is applied to gain understanding of diseases in man. Subsequent courses throughout the curriculum integrate basic biomedical, clinical sciences. Research and thesis/dissertation is supervised by graduate faculty of the basic biomedical sciences — anatomy, biochemistry, microbiology, pharmacology, and physiology. The School of Medicine application is processed through American Medical College Application Service (AMCAS) and should be completed by November of the year prior to admission. Graduate School applications, although accepted as late as the following spring, should be processed at the same time and specify medical scientist as the program.

Admission Applicants submit complete applications (with fees) to both the Graduate School and the School of Medicine during the senior undergraduate year.

Acceptance to the Graduate School is granted after application review and recommendation by an admissions committee.

The admissions committee makes its recommendations based on the usual Graduate School criteria, personal interview, and some measures of relevant traits such as analytic potential, inquisitiveness, creativity, compassion, and initiative of the applicant.

Applicants must be accepted into both the Graduate School and the School of Medicine to allow participation in the program. Accepted applicants are invited to participate in the summer program in one of the anatomy, biochemistry, microbiology, physiology, or pharmacology research laboratories.

Curriculum The curriculum, which is innovative in courses and in sequence, integrates the clinical and research perspectives of medical science.

A twenty-six-unit sequence in cell and molecular biology taken during the first year emphasizes problem solving and analysis as a foundation for a research-oriented approach to biomedical science and medicine. Weekly parallel sessions integrate basic science and clinical concerns, expanding the perspective of the cell and molecular topics to include organ systems and the relationship to disease.

The sequence of the entire curriculum is:

Entry year: cell and molecular biology courses, gross anatomy and histology

Summer: research

Modified freshman year, School of Medicine. May also include medical microbiology

Summer: research

Modified sophomore year, School of Medicine

Research year(s): research and courses for M.S. or Ph.D. (Subsequent financial aid will depend on the degree completed.)

Modified junior year, School of Medicine

Modified senior year, School of Medicine

Advisement Students admitted are classified as medical scientists on School of Medicine and Graduate School rosters and are advised by the program coordinator.

During the sophomore medical year, students choose a basic science program in which they concentrate subsequent research and course efforts, guided by the graduate program coordinator for the chosen discipline.

Time limits Limits relate especially to completion of the academic degree and to financial assistance for the professional degree.

Up to three years between the sophomore and junior years of the School of Medicine are allowed for completion of the Ph.D. degree; one year is allowed for the M.S. degree. Completion within these times assures financial aid in the junior and/or senior School of Medicine years; see Financial Assistance.

Reentry to the School of Medicine for the junior year does not require completion of the academic degree, although there is no further financial aid in the School of Medicine until the academic degree is completed.

Completion of the M.D. degree before completion of the academic degree automatically withdraws a student from the combined degree program and the Graduate School. Normal reapplication to the Graduate School is available; readmission may involve repetition of courses and changes in research activity, if recommended by the admissions committee. Financial aid would be renegotiated in view of changed circumstances.

Financial assistance Financial assistance to students admitted to the Medical Scientist Program provides:

1. Stipends similar to those in other School of Medicine/Graduate School basic science programs during the graduate school years — the entry year and those following the sophomore medical year.

2. Graduate School and School of Medicine tuition waivers may be available through the completion of the M.S. or Ph.D. degree, whichever is the terminal degree for the student.

3. A tuition waiver without stipend during the junior medical year only for completion of the M.S. degree; tuition waiver for both the junior and senior medical years for completion of the Ph.D. degree. (No waiver of tuition is granted in either year for students failing to complete the graduate degree.)

Funds for waivers and stipends derive in part from an alumni gift.

COURSES

CMBL 501 Steady State Cell (8)
The generalized cell. Its structural and functional integrity in a thermodynamically hostile environment. Biochemical concepts of the flow of biological information and of free energy. Emphasis on the interplay of information and energy, the integrating role of compartmentalization, and regulation of metabolic pathways. Fall quarter.

CMBL 502 The Cell in Transition (8)
Processes by which the generalized cell either enters the cell cycle to replicate or undergoes transition to a terminally differentiated cell with specialized structures and functions. Regulation of the cell cycle. Structural and functional organization of the chromosome. Regulation, control, and manipulation of genetic information. Winter quarter.

CMBL 503 The Differentiated Cell (10)
Biological membranes and cell fibrillar systems as a basis for studying specialized structures and functions of selected differentiated cell types. The role of cell-cell interactions in specialized tasks. Emphasis on underlying molecular mechanisms of specialized cell function. Spring quarter.

CMBL 511, 512, 513 Clinical Correlates (1, 1, 1)
A three-quarter companion sequence to CMBL 501, 502, 503 that utilizes the topics of cell functions presented in the major sequence as a basis for discussion of clinical problems arising from abnormalities in those functions. Fall, winter, spring quarters.

CMBL 537 Introduction to Human Genetics (1)
Introduction to medical genetics, human chromosomal abnormalities, Mendelian inheritance, multifactorial inheritance, prenatal diagnosis, newborn screening, and genetic counseling. Winter quarter.

CMBL 538 Molecular Biology of Prokaryotes and Recombinant DNA (4)
Study of the principles and tools of molecular biology in the context of current research with prokaryotic organisms. Topics include the characteristics of mobile genetic elements, bacteriophages and plasmids, genetic recombination, DNA-modifying enzymes, cloning vehicles, directed mutagenesis, and nucleotide sequencing. Winter quarter.

CMBL 539 Molecular Biology of Eukaryotes and Gene Regulation (4)
Surveys current concepts of gene regulation, with emphasis on eukaryotic systems. Topics include the structure and function of bacterial operons, molecular biology of selected eukaryotic viruses, eukaryotic gene structure, RNA splicing, chromosome organization, regulation of cell proliferation, transcriptional and posttranscriptional regulation of gene expression, oncogenes. Winter quarter.

CMBL 541 Cellular Structural Elements (5)

A comprehensive description of biological membranes, receptor transduction systems, and cell fibrillar systems that will form a basis for ellucidating the functions of specialized cells. Spring quarter.

CMBL 543 Cell-Cell Interactions (3)

Discussion of the role of cell-cell interactions and the mechanism for cellular specialization, emphasising the immune system. Spring quarter.

MICROBIOLOGY

FACULTY

BARRY L. TAYLOR, PH.D. Case Western Reserve University 1973
Chairman; Professor of Microbiology and Biochemistry
Microbial physiology, mechanism of oxygen chemoreceptors, bacterial chemotaxis

LEONARD R. BULLAS, PH.D. Montana State University 1963
Program Coordinator; Professor of Microbiology
Microbial and molecular genetics, bacteriology

BENJAMIN H. S. LAU, PH.D. University of Kentucky 1966; M.D. Loma Linda University SM 1980
Professor of Microbiology and Surgery (urology)
Cellular and tumor immunology, medical bacteriology, mycology

SANDRA L. NEHLSEN-CANNARELLA, PH.D. National Institute for Medical Research, London 1971
Professor of Microbiology, Surgery, and Immunology
Research Professor of Pathology
Transplantation immunology, reproductive immunology, autoimmunity

GEORGE T. JAVOR, PH.D. Columbia University 1967
Associate Professor of Microbiology and Biochemistry
Bacterial physiology

JAMES D. KETTERING, PH.D. Loma Linda University 1974
Associate Professor of Microbiology
Virology, tumor immunology, medical bacteriology

JOHN E. LEWIS, PH.D. Loma Linda University 1969
Associate Professor of Microbiology, Pathology, and Medicine
Immunology, medical bacteriology

ANTHONY J. ZUCCARELLI, PH.D. California Institute of Technology 1974
Associate Professor of Microbiology and Biochemistry
Molecular genetics, bacteriophage biology, genetic engineering

WILLIAM C. EBY, M.D. Loma Linda University 1967; PH.D. University of Illinois 1978
Assistant Professor of Microbiology and Pathology
Immunology

ERIC A. GOULBOURNE, JR., PH.D. Cornell University 1983
Assistant Professor of Microbiology
Microbial ecology and physiology, bacteriology

DAILA S. GRIDLEY, PH.D. Loma Linda University 1978
Assistant Professor of Microbiology
Immunology, virology

JUN-ICHI RYU, PH.D. Tokyo Metropolitan University 1978
Assistant Professor of Microbiology
Molecular genetics

GUISEPPE A. MOLINARO, M.D. Naples University 1960
Associate Research Professor of Microbiology, Pathology, and Pediatrics
Immunology, autoimmunity

ASSOCIATE FACULTY

IRA ROY, PH.D. Ohio State University 1965
Assistant Professor of Microbiology
Diagnostic mycology, bacteriology, antimicrobial agents

The Department of Microbiology offers programs leading to the Master of Science and the Doctor of Philosophy degrees. The programs include a core curriculum which provides a broad background in medical microbiology, bacterial physiology, immunology, and molecular biology. Advanced courses allow the student to develop fully an area of interest. The department is developing strengths in molecular genetics and the applications of recombinant DNA technologies, in microbial physiology, in bacterial chemotaxis, and in immunology, including transplant and cancer immunology. The Master of Science degree provides content appropriate for persons preparing to teach at the secondary level, or training to become a technician who is involved in biomedical research or serving the biotechnology industry. The Master of Science degree is also suitable for medical technologists seeking to advance their careers. The Doctor of Philosophy degree is designed to prepare for a career of independent research and teaching, or to prepare a medical technologist for a management position. In addition to these programs, combined M.D./M.S., M.D./Ph.D., D.D.S./M.S. and D.D.S./Ph.D. degrees are offered. (See sections on combined science/professional degrees and Medical Scientist Training program.) The combined M.S./professional degree is designed to provide additional content or research experience as background for postgraduate medical or dental education. The combined Ph.D./professional

degree program prepares the graduate for a career in academic medicine or dentistry combining research, teaching, and clinical practice.

Master of Science The student completes courses which constitute a core of microbiology graduate programs: Medical Microbiology (MICR 521), Bacterial Physiology (MICR 534), Immunology (MICR 520), and Genetics and Molecular Biology (MICR 519) or Molecular Biology of Prokaryotes (MICR 535) plus other microbiology courses for a total of 19 units. In addition, the student completes 9-14 units of course work in microbiology, which may include 5 units of a minor such as biochemistry or human physiology. Six units of research and 3 units of thesis are also required, leading to the presentation of a thesis or publishable paper. Together with 3 units of seminar and the 3 units of religion required by the University, a minimum total of 48 units is required for graduation.

Doctor of Philosophy The student who has completed or is completing a Master of Science degree, or is completing or has completed a bachelor's degree with a superior academic record, may apply for admission to the Doctor of Philosophy program. This is a full-time program which can be completed by most candidates in four or five years. Candidates in a combined professional/Ph.D. degree program may require less time. Requirements for candidates with a master's degree in microbiology include a minimum of 18 units of elective course work in microbiology to include 2 units of special problems in microbiology, 8 units of cognate courses (for example, graduate-level biochemistry), and 3 units of seminar. Exemption from a required course on the basis of previous completion of an equivalent course may be granted at the discretion of the faculty. Twelve units of research and dissertation are also required. Together with the 3 units of religion required by the University, a minimum of 44 units beyond the master's degree is required for graduation. Candidates for the Doctor of Philosophy degree are assigned to laboratories and are expected to participate in research during the first year of their graduate program. They must pass a written examination in four of five selected areas of microbiology and an oral examination of a written research proposal. A minimum of one quarter of teaching experience is required of each student. After passing the written and oral examinations, the student applies for admission to candidacy. The candidacy period is spent in full-time research. On completion of the research and the writing of the dissertation, the dissertation is publicly defended at an oral examination.

Details of the graduate program are given in the *Student Guide* supplied by the Department of Microbiology.

Microbiology minor A minor in the department consists of a minimum of 9 units of microbiology course work.

Combined degree programs Information about the M.D./M.S., D.D.S./Ph.D., M.D./M.S. and D.D.S./Ph.D. programs offered in conjunction with the Department of Microbiology are to be found in the sections *Programs and Degrees* and *Medical Scientist Program.*

Prerequisites The minimum science prerequisites for admission to the graduate programs are (quarter units);

General biology (12)
General chemistry (12)
Organic chemistry (12)
General physics (12)
Microbiology (complete course)
Biochemistry (8) (strongly recommended)

Waiver of any one of these requirements is only by departmental consent, which must be obtained before admission into the program.

General information For provisions applicable to the basic sciences, the student should consult "Specific Requirements for the Basic Science Programs" in the *Programs and Degrees* section of the Graduate School BULLETIN.

For information about the requirements and practices to which all graduate students are subject, the student should consult the *Academic Practices* section of division I of the Graduate School BULLETIN.

COURSES

MICR 519 Principles of Molecular Biology and Genetics (5)
A survey of bacterial physiology, microbial genetics, prokaryotic and eukaryotic molecular biology, and basic principles of human genetics. Identical to MDCJ 512.
Staff.

MICR 520 Basic Immunology (2)
The study of cellular and molecular aspects of the immune system, immune responses associated with host defense and disease processes, cellular interaction, and modern immunologic technology. Identical to the immunology section of MDCJ 513.
Staff.

MICR 521 Medical Microbiology (8)
A systematic study of microorganisms of medical importance, pathogenic mechanisms, host parasite relationships, and methods of identification. Identical to MICR 511.
Staff.

MICR 534 Microbial Physiology (3)
Provides in-depth coverage of microbial nutrition and growth kinetics; structure and function; bioenergetics and metabolism; nutrient transport; and special bacterial groups or processes unique to microorganisms.
Suggested prerequisite: A course in biochemistry highly recommended.
Goulbourne.

MICR 535 Molecular Biology of Prokaryotes and Recombinant DNA (4)

A study of the principles and tools of molecular biology in the context of current research with prokaryotic organisms. Topics include the characteristics of mobile genetic elements, bacteriophages and plasmids, genetic recombination, DNA modifying enzymes, cloning vehicles, directed mutagenesis and nucleotide sequencing. Crosslistings CMBL 538; BIOL 546.

Zuccarelli.

MICR 536 Advanced Molecular Genetics Laboratory (4)

Laboratory exercises which provide practical experience in current techniques for gene manipulation, including transposon mutagenesis, gene mapping, operon fusion, restriction enzyme mapping, DNA isolation, gene cloning, and DNA hybridization.

Prerequisite: One or more of the following courses: MICR 535, 555; BIOL 546; CMBL 502.

Ryu, Zuccarelli

MICR 537 Selected Topics In Molecular Genetics (2)

Emphasizes advanced knowledge of current subjects in molecular genetics, with extensive discussions and the assignment of a selected topic.

Ryu.

MICR 538 Molecular Biology Of Eukaryotes and Gene Regulation (4)

Surveys current concepts of gene regulation, with emphasis on eukaryotic systems. Topics include the structure and function of bacterial operons, molecular biology of selected eukaryotic viruses, eukaryotic gene structure, RNA splicing, chromosome organization, regulation of cell proliferation, transcriptional and posttranscriptional regulation of gene expression, oncogenes. Crosslistings CMBL 539; BCHM 524.

Zuccarelli.

MICR 542 Applied Clinical Microbiology (3)

Designed for microbiologists and medical and allied health personnel having a special interest in diagnostic clinical microbiology and infectious diseases. Conferences and special projects assigned.

Lau.

MICR 546 Advanced Immunology (4)

Topics include autoimmunity, idiotypic networks, immunocyte differentiation, major histocompatibility complex, signal transduction, interleukins, tumor necrosis factor, leukotrienes, and transplant immunology.

Prerequisite: Medical Cell Biology and Immunology (MDCJ 513), Medical Microbiology (MICR 511 or MICR 521), or other introductory course in immunology (e.g., MICR 520).

Staff.

MICR 555 Microbial Genetics (3)

Genetic processes of bacteria and viruses. The contribution that an understanding of the genetic processes of microorganisms has made to the understanding of the nature of the genetic material and the mechanism of its action.

Bullas.

MICR 565 Virology (3)

Fundamental aspects of virus-cell relationships of bacteriophages and selected groups of animal viruses.

Kettering.

MICR 566 Cell Culture (3)

The practical aspects of growth of animal cells in culture. Experience with both primary cell cultures and established cell lines.

Gridley.

MICR 568 Laboratory Techniques in Virology (3)

Laboratory exercises involving bacteriophages and animal viruses. Handling, growth, assay, serological, and other procedures utilized in virus research.

Kettering.

MICR 594 Medical Mycology (3)
Systematic study of those fungi that cause disease in humans and animals, with special emphasis on the clinical and diagnostic features of fungal infections and the epidemiology and public health significance of the fungi.
Lau.

MICR 604 Seminar in Microbiology (1)
Required for a major in microbiology.

MICR 624 Special Problems in Microbiology (2-4)
Required for a major in microbiology.

MICR 697 Research (1-4)

MICR 698 Thesis (1-3)

MICR 699 Dissertation (arranged)

NURSING

FACULTY

PATRICIA C. FOSTER, PH.D. Claremont Graduate School 1979
Program Coordinator; Professor of Nursing
Medical/surgical nursing

PATRICIA S. JONES, PH.D. Vanderbilt University, Peabody College 1977
Professor of Nursing
Medical/surgical nursing

HELEN E. KING, PH.D. Boston University 1973
Dean; Professor of Nursing
Medical/surgical nursing

LOIS VAN CLEVE, PH.D. Claremont Graduate School 1985
Professor of Nursing
Parent/child nursing

CLARICE W. WOODWARD, M.S. University of California, Los Angeles 1964
Professor of Nursing
Parent/child nursing

GRENITH J. ZIMMERMAN, PH.D. University of Minnesota 1970
Professor of Nursing
Biostatistics

KAREN L. CARRIGG, ED.D. Loma Linda University SE 1988
Associate Professor of Nursing
Psychiatric/mental health nursing

FRANCES P. MILLER, PH.D. University of California, Riverside 1985
Associate Professor of Nursing
Community health nursing

RUTH S. WEBER, M.S. Loma Linda University GS 1975; M.A.M. Claremont Graduate School 1984
Associate Professor of Nursing
Medical/surgical nursing, administration

A curriculum leading to a Master of Science degree with a clinical nursing major or a nursing administration major is offered through the Graduate School of Loma Linda University. Clinical nursing majors may choose from one of two areas of emphasis: *growing family* or the *adult and aging family*, with functional preparation in teaching.

In graduate education the student has opportunity for the intense pursuit of knowledge in a chosen field of interest. The teaching-learning focus is on the attainment of knowledge and the development of advanced intellectual, clinical, leadership, and investigative skills.

A minimum of 52 quarter units is required to complete the program. The five-quarter sequence ideally begins in the fall quarter; however, students may be admitted any term during the year; and part-time study is available. The entire course is planned with consideration for individual needs and in consultation with the major adviser. Students may petition to transfer up to 9 quarter units of graduate credit from an approved educational institution.

GOALS OF THE GRADUATE PROGRAM IN NURSING

The primary goal of the program is to prepare nurse leaders who are capable of contributing to professional nursing through clinical practice, teaching, administration, and research. Upon completion of the master's degree program the nurse will:

1. Use advanced knowledge acquired from the sciences and interaction with scholars as a basis for advanced nursing practice and role development.
2. Use the research process in order to refine and expand the developing knowledge of nursing as a rationale for practice.
3. Have acquired knowledge and practice in a chosen functional area.
4. Collaborate with clients, health professionals, and organizations for the purpose of evaluating, goal setting, and improvement in the delivery of health care.
5. Possess expertise in a selected clinical area.
6. Examine the current state of theoretical development in nursing and utilize this as a basis for advanced clinical practice, research, teaching, and/or administration.
7. Demonstrate self-confidence, self-assertiveness, and creativity.
8. Demonstrate empathy, compassion, respect, and sensitivity towards others.
9. Show a disposition to evaluate facts and ideas critically, to think independently and logically, and to demonstrate intellectual integrity.
10. Organize, explain, and defend one's views effectively and rationally through verbal and written communication.

11. Show openness to new ideas while dealing with complexity and ambiguity.
12. Value the need for continued inquiry and scholarly endeavor beyond the academic experience.
13. Use informed judgment to make moral, ethical, and intellectual decisions.
14. Seek new knowledge by means of critical thinking, creative reasoning, and scientific investigation in relation to nursing practice and theory.
15. Possess a foundation for doctoral study.

ADMISSION TO THE GRADUATE PROGRAM

Admission The following criteria are considered for admission to the graduate program in nursing:

A baccalaureate degree in nursing from a college or university accredited by the National League for Nursing (or its equivalent).

An undergraduate record with a grade average of B (3.00), both cumulative and in the nursing major.

Applicants with an A.S. degree or diploma in nursing from an NLN-accredited program and who have a B.S. or B.A. degree in another field can qualify for admission to the graduate program in nursing by taking 24 quarter units of approved, upper division clinical nursing that would include at least 8 quarter units of community health nursing (with field experience). The other prerequisites listed below must also be met.

Graduate Record Examination general section. It is recommended that the applicant have a composite minimum score of 900-1000 for the verbal and quantitative sections. Individuals with lower scores may be asked for additional evidence of aptitude for graduate study.

Current California registered nurse license before enrollment in clinical nursing courses. Individuals admitted pending examination results are subject to withdrawal from clinical courses if the examination is not passed.

The applicant is encouraged to have nursing experience in the area of the desired clinical major before beginning graduate study. One year of experience as a registered nurse is required to enter the administration major.

Prerequisite courses include:

General statistics (descriptive and beginning inferential), 3 quarter units.

Introduction to research methods, 2 quarter units, or equivalent.

PROGRAM REQUIREMENTS

Grades A minimum grade point average of 3.00 must be maintained in all work taken for the degree.

Research options The student has the option of completing one of two research programs within the curriculum for the master's degree. The choice is based on evaluation of which program better prepares the individual student for the chosen leadership role in nursing. The decision is made in consultation with the student's adviser.

Candidacy Students are eligible for candidacy after completing 16 and before completing 24 units of required graduate course work or two quarters of the program.

Examination A comprehensive written and oral examination is required. In order to take the comprehensive examination, graduate students in nursing must successfully complete or be currently enrolled in at least 40 units which apply to degree requirements. The examination must be taken before enrolling in the last 8 units of the program and before taking the final functional practicum.

Curriculum change To maintain quality education, the curriculum is subject to change without prior notice. Students in continuous attendance will meet graduation requirements of the BULLETIN under which they enter the Graduate School.

Majors The graduate program offers majors in clinical nursing and nursing administration.

Required courses The following courses are required of all students:

NRSG 507 Concept and Theory Development in Nursing (3)
NRSG 510 Political Process and Professional Issues (2)
NRSG 604 Nursing in Family Systems (3)
NRSG 681, 682 Research Methods and Design in Nursing I, II (2, 3)
_____ Religion (3)
_____ Behavioral and/or natural science cognates: (4)
_____ Research option (3-6)

General requirements For information about requirements and practices to which all graduate students are subject, the student should consult the *Academic Practices* section of division I of the Graduate School BULLETIN.

Clinical nursing major The clinical major in nursing prepares nurses who have advanced nursing knowledge, clinical expertise, and functional preparation in teaching. All graduates within a clinical major meet the ANA standards for definition of a clinical specialist. Clinical majors are offered in the following areas (required courses indicated):

NURSING AND CLIENT SYSTEMS: The Growing Family
NRSG 606 Community and Mental Health Nursing (3)
NRSG 614 The Childbearing Family (3)
NRSG 615 The Childrearing Family (3) **or**
NRSG 616 Human Development in the Life Cycle (3)

NURSING AND CLIENT SYSTEMS: The Adult and Aging Family
NRSG 606 Community and Mental Health Nursing (3)
NRSG 616 Human Development in the Life Cycle (3)
NRSG 624 The Adult Family (3)
NRSG 626 The Aging Family (3)

Clinical majors are prepared in the functional area of teaching (required courses indicated):

TEACHING
NRSG 544 Nursing Leadership: Teaching (4)
NRSG 545 Practicum in Nursing Leadership: Teaching (4)
EDCI 515 Designing the College Curriculum (3)

RECOMMENDED
NRSG 547 History and Philosophy of Higher Education
EDCE 506 Instructional Evaluation and Design

Nursing administration major The major in nursing administration provides nurses the opportunity to acquire knowledge and skills in advanced clinical nursing, in management practices, and in the utilization of nursing research to promote the advancement of nursing as a profession.

The following courses are required, in addition to those required of all students:

MGMT 513 Human Resources Management (or equivalent) (4)
MGMT 525 Organizational Theory and Behavior (or equivalent) (4)
NRSG ___ Clinical Nursing Elective (3)
NRSG 541, 542 Practicum in Nursing Administration I, II (2, 3)
NRSG 543 Nursing Administration (3)

To complete the minimum of 52 units required for the degree, and to meet individual career goals, students may choose additional courses from business administration, health administration, education, psychology, nursing, or the behavioral sciences.

POSTBACCALAUREATE CERTIFICATE PROGRAM

Certificate in Nursing Management This program provides opportunity for nurses in leadership positions to acquire knowledge and skills needed to improve their managerial competence. The curriculum provides the basic elements in understanding organizations, their structure/process, the human component, fiscal/legal issues and their implications for nurse leaders. Twenty quarter, postbaccalaureate units are required for the certificate in nursing management.

Prerequisite admission requirements The following are prerequisite for admission:

Employment in a nursing management or leadership position.

Current B.R.N. licensure or equivalent.

B.S. degree in nursing.

Course requirements The following courses are required:

NRSG 543 Nursing Administration (3)
MGMT 513 Human Resources Management (or equivalent) (4)
MGMT 525 Organizational Theory and Behavior (or equivalent) (4)
_____ Electives (see below for suggested electives) (8)

Total units 20

The following are suggested elective courses:

NRSG 507 Concept and Theory Development in Nursing (3)
NRSG 510 Political Process and Professional Issues (2)
ACCT 506 Administrative Accounting (4)
FNCE 534 Health Administration and the Law (4)
FNCE 521 Administrative Finance (4)
FNCE 535 Budgeting for Service Organization (prerequisite BUAD 521) (4)

Students choosing to take course work applicable only to the nursing management certificate may register on an S/U basis rather than for graded credit. Students admitted to the Graduate School may request courses be applied toward a master's degree if taken for graded credit. The certificate is awarded by the School of Nursing.

COURSES

NRSG 506 Transcultural Nursing (2-3)

Study of world health needs, health manpower, and sociocultural influences. Patterns of health care examined in relation to culture and economics of selected countries. Problems, health beliefs, and practices of United States ethnic groups compared.

NRSG 507 Concept and Theory Development in Nursing (3)

The purpose of this course is to study the components of theory and theory development in nursing. Critical analysis of conceptual models in nursing and their application in practice.

NRSG 509 Guided Study (1-6)

Opportunity for study in a particular area of nursing under faculty direction.
Prerequisite: Consent of the adviser.

NRSG 510 Political Process and Professional Issues (2)

Analyzes selected historical, political, and legislative processes as regulatory forces that influence the health-care delivery system and the practice of nursing. The study of impact of the socio-political system, current trends, and issues affecting the changing profession of nursing, as well as the impact nursing can have on these systems.

NRSG 512 School Nursing Services (2-3)

Explores administrative styles in school health programs, with emphasis on management. Principles and analysis of school health program planning, methods for implementation and evaluation. Students registered for three units are involved in clinical experience.

NRSG 541, 542 Practicum in Nursing Administration (3, 2)

Observation and practice in selected levels of nursing administration.
Prerequisite: NRSG 543; MGMT 525 or equivalent; 6 quarter units of clinical nursing.

NRSG 543 Nursing Administration (4)

Study, application, and evaluation of principles of administration as they apply to nursing leadership.
Prerequisite: NRSG 507; MGMT 525 or equivalent; one quarter of clinical nursing.

NRSG 544 Nursing Leadership: Teaching (4)

Exploration of the components of the teaching-learning process. Opportunity provided for students to practice specific teaching skills.

NRSG 545 Practicum in Nursing Leadership: Teaching (4)

Designed to assist the student in developing the ability to teach nursing in the clinical area of choice. Emphasis on the nurse-teacher as facilitator of learning. Practice in teaching students in clinical and classroom settings.
Prerequisite or concurrent: EDFO 547; EDCI 515; NRSG 544; and 12 quarter units of clinical nursing.

NRSG 604 Nursing in Family Systems (3)

Concepts and theories guiding advanced nursing practice in caring for the family coping with alterations in health are studied. Clinical practicum concurrent.

NRSG 606 Community and Mental Health Nursing (3)

Study given to the organization of human systems, special populations, and communities and their influence on health behaviors. Nursing process used in the identification of health-care needs and the fostering of community mental health. Required for clinical majors. Clinical practicum concurrent.

NRSG 614 The Childbearing Family (3)

Study of the family system during childbearing. Social, cultural, physiological, and psychological factors influencing the family's changing roles and relationships discussed. Exploration of theories and research findings dealing with the evolving parent/child relationship. Concurrent practicum required.

NRSG 615 The Childrearing Family (3)

The adaptation of the family system during the childrearing years. Health problems of childhood, including illness and hospitalization, are studied; emphasis on the nursing role in minimizing psychosocial trauma and promoting normal development. Concurrent practicum required.

NRSG 616 Human Development in the Life Cycle (3)

Selected theoretical knowledge about human development. Considers both the process of development and/or aging and the unique characteristics of each age period from the combined perspectives of social, psychological, and cognitive development.

NRSG 624, 626 The Adult and Aging Family (3, 3)

Focus on adult and aging clients in the context of family and a changing society. Exploration of theories related to the aging process and issues affecting the aging persons. Examination of current research related to common health problems of this age group, and emphasis on a wholistic approach to health care.

NRSG 681 Research Methods and Design in Nursing I (2)

Emphasizes the application of research process to nursing problems and the design in a professional scientific context. Includes the use of statistics and the computer in data analysis.

Prerequisite: STAT 404 or equivalent; NRSG 498 or equivalent.

NRSG 682 Research Methods and Design in Nursing II (3)

Application of research concepts in proposal development. Peer review of graduate student research proposals. Includes the use of statistics and the computer in data analysis.

Prerequisite: NRSG 681.

NRSG 698 Research and Thesis in Nursing (2-6)

The nonthesis project requires registration for two units. For thesis credit, a total of six units is required.

NUTRITION

FACULTY

KATHLEEN K. ZOLBER, PH.D. University of Wisconsin 1968
Chairman; Professor of Nutrition
Food systems administration

JAMES W. BLANKENSHIP, PH.D. University of Wyoming 1969
Professor of Nutrition
Lipids

U. D. REGISTER, PH.D. University of Wisconsin 1950
Professor of Nutrition
Public health nutrition, vitamins

ALBERT SANCHEZ, DR.P.H. University of California, Los Angeles 1968
Professor of Nutrition
Public health nutrition, proteins

BERTRUM C. CONNELL, PH.D. University of Missouri-Columbia 1981
Associate Professor of Nutrition
Food systems administration

PATRICIA K. JOHNSTON, DR.P.H. University of California, Los Angeles 1987
Associate Professor of Nutrition
Public health nutrition, maternal and child nutrition, nutrition and aging, minerals

DAVID C. NIEMAN, D.H.SC. Loma Linda University SPH 1984
Associate Professor of Nutrition
Carbohydrates, nutritional assessment, nutrition and fitness

ASSOCIATE FACULTY

KENNETH I. BURKE, PH.D., Florida State University 1973
Professor of Nutrition
Foods, nutrition

RICHARD W. HUBBARD, PH.D., Purdue University 1961
Associate Professor of Biochemistry
Clinical chemistry, amino acid metabolism

TERRY D. SHULTZ, PH.D. Oregon State University 1980
Associate Professor of Nutrition and Biochemistry
Vitamins, biochemistry, nutrition

MASTER OF SCIENCE DEGREE

The Master of Science degree is offered through the Graduate School as outlined below. The objectives of the program are to:

1. Provide students with an understanding of nutritional concepts for guidance in their efforts to improve the nutritional status of the individual and the community.
2. Stimulate scientific curiosity and provide opportunities and facilities for research that will contribute to the fundamental knowledge of nutrition, both basic and applied.
3. Prepare students to evaluate the diets of individuals and populations and provide sound bases for making recommendations or initiating programs for nutritional improvements.
4. Instruct in the principles of diet therapy and encourage cooperation with the physician and other members of the medical team.
5. Initiate habits of continuing self-education that will enhance professional growth.
6. Assist in fulfilling the objectives of the School and the University.

A student who has a baccalaureate degree with a major in foods and nutrition, or in related areas with an adequate background in nutrition and biochemistry, may apply for graduate study in nutrition. This program is planned to provide for anticipated careers in teaching, research, and/or nutrition practice.

Prerequisites The following courses are prerequisites to the department courses.

Basic nutrition
Basic foods
General chemistry
Organic chemistry (2 quarters)
Human physiology
Microbiology
Computer literacy

Biochemistry is helpful but not required for entrance. Quantitative chemistry is strongly recommended.

Nine units of research and thesis on an approved subject leading to a successful oral defense are required.

The nutrition student who wishes to establish eligibility to write the registration examination to become a registered dietitian may apply to the Preprofessional Practice Program in Dietetics (AP4) which is currently granted approval status by The American Dietetic Association Council on Education Division of Education Accreditation/Approval, a specialized accrediting body recognized by the Council on Postsecondary Accreditation and the United States Department of Education.

For a major in nutrition, in addition to electives the following courses are required:

BCHM 504	Introduction to Biochemistry (5)
BCHM 514	Medical Biochemistry Laboratory (1)
NUTR 506	Carbohydrates (3)
NUTR 507	Proteins (3)
NUTR 508	Lipids (3)
NUTR 515	Minerals (2)
NUTR 516	Vitamins (2)
NUTR 527	Assessment of Nutritional Status (3)
*NUTR 528	Symposium: Adventist Philosophy of Nutrition (1)
NUTR 545	Preventive and Therapeutic Nutrition (3)
*NUTR 604	Seminar in Nutrition (1)
NUTR 694	Research (7)
NUTR 695	Thesis or publishable paper (2)
STAT 509	General Statistics

*choose 3 in consultation with adviser

UNITS REQUIRED IN MAJOR (Nutrition): 22 (not to include research/thesis)

ELECTIVES NEEDED: 12 (6 in Nutrition)

MINIMUM UNITS REQUIRED FOR GRADUATION: 48

Details of the graduate program are given in the *Student Guide*, published by the Department of Nutrition

General requirements For information about requirements and practices to which all graduate students are subject, the student should consult the *Academic Practices* section of division 1 of the Graduate School BULLETIN.

Program A professional program for the Master of Public Health degree is offered through the School of Public Health and is outlined in the BULLETIN of that School.

COURSES

GRADUATE COURSES

NUTR 506 Carbohydrates (3)
Nutrition and metabolism of carbohydrates as related to health and disease.
Prerequisite: Biochemistry.
Nieman.

NUTR 507 Proteins (3)
Nutrition, metabolism, and function of proteins as related to health and disease.
Prerequisite: Biochemistry or consent of instructor.
Sanchez.

NUTR 508 Lipids (3)
Metabolism and nutrition of lipids as related to health and disease.
Prerequisite: Biochemistry or consent of the instructor.
Blankenship.

NUTR 509 Public Health Nutrition (2-3)

Survey of national and international nutrition problems in public health. Concepts of applied nutrition. Two-unit option available only to registered dietitians and persons with similar backgrounds.

Johnston, Register, Sanchez.

NUTR 515 Minerals (2)

Study of physiological functions and metabolism of selected macrominerals and trace minerals in humans. Interaction of essential minerals with vitamins and toxic minerals.

Prerequisite: Biochemistry and physiology

Johnston.

NUTR 516 Vitamins (2)

Descriptive information on water- and fat-soluble vitamins. Biochemical and physiological role or functions and their implication in the health and nutrition of the individual. Newer research in the field of vitamins.

Prerequisite: Biochemistry and physiology

Register, Shultz

NUTR 527 Assessment of Nutritional Status (3)

Designed to acquaint students with techniques of individual and community nutrition assessment; dietary intake and evaluation, use and evaluation of computer software, anthropometric measurements, biochemical and clinical evaluation and nutritional counseling. Laboratory included.

Prerequisite: Basic nutrition, NUTR 509, or consent of the instructor.

Nieman, Pollard.

NUTR 528 Symposium: Adventist Philosophy of Nutrition (1)

The science of nutrition as related to the Seventh-day Adventist philosophy of health.

Prerequisite: NUTR 509 or consent of instructor.

Scharffenberg, Staff.

NUTR 534 Maternal and Child Nutrition (3)

Role of nutrition in human growth and development, with emphasis on prenatal, infancy, preschool, school age, and adolescence.

Prerequisite: NUTR 509 or basic nutrition or consent of instructor.

Johnston.

NUTR 536 Nutrition and Aging (2)

Biochemical and physiological basis for nutrient requirement in aging. Effect of nutrition on aging and chronic degenerative diseases, and their effects on nutrient requirement. Epidemiologic basis for setting dietary goals.

Prerequisite: Basic nutrition, physiology, biochemistry, or equivalent.

Johnston.

NUTR 545 Preventive and Therapeutic Nutrition (3)

Rationale for diet therapy and nutritional care for a variety of clinical and public health nutrition disorders. Preventive and therapeutic measures related to patients' needs.

Prerequisite: Basic nutrition, physiology, or equivalent.

Abu-Assal.

NUTR 575 Food Systems Management (3)

Application of current management concepts to the administration of a dietary service for effective utilization of resources.

Prerequisite: HADM 509 or equivalent

Zolber, Connell.

NUTR 604 Seminar in Nutrition (1)

Presentation and discussion in the area of interest; individual reports dealing with recent developments. May be repeated for credit.

Prerequisite: Five graduate units in nutrition or consent of the instructor.

Staff.

NUTR **694 Research (arranged) (7)**

NUTR **695 Thesis or Publishable Paper (2)**

NUTR **696 Directed Study (1-4)**
Open by arrangement to the advanced student.

NUTR **697 Special Project (1-4)**
Extensive study and written report on a selected problem.

PALEONTOLOGY

FACULTY

H. PAUL BUCHHEIM, PH.D. University of Wyoming 1978
Program Coordinator; Associate Professor of Geology and Biology
Sedimentology, paleolimnology, paleoecology

LEONARD R. BRAND, PH.D. Cornell University 1970
Professor of Biology
Vertebrate zoology and paleontology

RICHARD D. TKACHUCK, PH.D. University of California, Los Angeles 1970
Professor of Biology
Biogeography, paleoparasitology

ASSOCIATE FACULTY

IVAN G. HOLMES, PH.D. Oregon State University 1969
Professor of Chemistry
Geochemistry, clay mineralogy

ARIEL A. ROTH, PH.D. University of Michigan 1955
Professor of Biology
Paleoecology, earth history modeling

CLYDE L. WEBSTER, PH.D. Colorado State University 1972
Professor of Chemistry
Geochemistry, mass spectroscopy, trace element modeling

MASTER OF SCIENCE

The Paleontology Program has been planned to provide the student with interest in the biology of ancient life the opportunity for advanced study and professional preparation for employment or for continued education at the doctoral level. The research and thesis requirement along with the experience provided in courses develop the student's potential to solve complex paleontological and associated sedimentological problems and to interpret the fossil record.

The strength of Loma Linda University's paleontology program lies in its emphasis on field research dealing with organism-sediment relations, paleoecology, and tephonomic processes. Problems of stratigraphic paleontology and historical geology are also emphasized. The student who enters this program will be given a background in sedimentary geology as well as familiarity with several broad areas of paleontology.

Research and instructional facilities — including laboratories, museum, and classrooms — are located on the La Sierra campus. Research equipment and facilities are available for a variety of types of laboratory and field research in paleontology and geology. Specialized equipment include an X-ray defractometer, atomic absorption spectrophotometer, optical microscopes, IBM computers and associated hardware and software, specialized oceanographic and limnological equipment, boats, 4-wheel drive vehicle, and travel trailer. The department is well equipped with both paleontology and geology study collections.

Admission Applicants must meet the general Graduate School admission requirements. Acceptable undergraduate preparation includes a bachelor's degree, and must include: a general earth science course, advanced general geology (or courses in mineralogy, petrology, and structural geology), mathematics, and one year courses in biology, chemistry, and physics. Students lacking some of these courses may be accepted on a provisional basis and make up deficiencies while enrolled at the University.

Curriculum A minimum of 48 quarter units, including 28 at or above the 500 level, constitutes the curriculum for the Master of Science degree in paleontology. Besides the general Graduate School requirements, the

following courses are required as part of either the undergraduate or graduate program:

Research techniques
Sedimentology
Field methods
Historical geology and paleontology
biosystematics and speciation
Seminar
Paleoenvironments
Philosophy of geology or Field interpretations

The student must select two of the following courses as electives:

Paleobotany
Paleolimnology
Verebrate paleontology
Invertebrate paleontology

Students may choose one other elective from the above list or:

Topics in geology
Other paleontology or biology electives as approved by advisement committee

The remainder of the student's program will be planned in consultation with the major professor and graduate advisory committee. In addition to course work, students are expected to attend all program seminars, fulfill research and thesis expectations, and successfully pass a final oral examination.

COURSES

UPPER DIVISION PALEONTOLOGY AND GEOLOGY COURSES APPLICABLE TO GRADUATE PROGRAM

GEOL 405 Historical Geology and Paleontology (4)

GEOL 425 Field Methods (4)

GEOL 431 Geochemistry (4)

GEOL 437 Geophysics (4)

GEOL 456 Sedimentology (5)

GEOL 475 Current Topics in Geology (1-4)

GEOL 489 History and Philosophy of Science (4)

GEOL 496 Workshop in the Earth Sciences (4)

GEOL 499 Directed Study (1-4)

BIOL 400+ level courses as approved by guidance committee

GEOL 515 Research Techniques (2)
Concepts and methods used in geological research, including scientific literature, research design, and proposal writing.

GEOL 524 Paleobotany (4)
The study of fossil plants, their morphology, paleoecology, taphonomy, classification, and stratigraphic distribution. Analysis of floral trends in the fossil record. Three class hours, one three-hour laboratory or field trip per week. Offered alternate years.
Prerequisite: GEOL 405 and a course in botany or consent of the instructor.

GEOL 525 Palynology (4)
Survey of the scope, methods, and application of the study of plant microfossils as related to understanding and interpreting the fossil record. Emphasis on the stratigraphic succession of fossil spore floras. Laboratory work integrated with lecture. Offered alternate years.
Prerequisite: GEOL 405 and a course in botany or consent of the instructor.

GEOL 534 Invertebrate Paleontology (4)
Study of the structure, classification, ecology, and distribution of selected fossil invertebrate groups. Principles and methods involved in the study and analysis of invertebrate fossils considered. Three class hours, one three-hour laboratory per week. One field trip required. Offered alternate years.
Prerequisite: GEOL 405 or consent of the instructor.

GEOL 535 Micropaleontology (4)
Morphology, taxonomy, and stratigraphic use of major groups of fossil microorganisms. Emphasis on foraminifers. Three class hours, one three-hour laboratory per week. Offered alternate years.
Prerequisite: GEOL 405 or equivalent or consent of the instructor.

GEOL 544 Vertebrate Paleontology (4)
Structure, classification, distribution, and taphonomy of fossil vertebrates. Principles of interpretation of their fossil record. Two class hours, two three-hour laboratories per week. Offered alternate years.
Prerequisite: GEOL 405 or consent of the instructor.

GEOL 548 Field Interpretations in Historical Geology (4)
Analysis of the fossil and stratigraphic record, and comparison to theories of origin. Fieldwork at specific sites in the western United States. Summer only.
Prerequisite: GEOL 405 or consent of the instructor.

GEOL 554 Paleolimnology (4)
The study of ancient lake deposits, including their sedimentologic, paleontologic, mineralogic, geochemical, and stratigraphic characteristics. The depositional processes occurring in modern lakes investigated as analogs. Laboratory and fieldwork included. Offered alternate years.
Prerequisite: GEOL 304 or consent of the instructor.

GEOL 556 Paleoenvironments (4)
Application of paleontologic, sedimentologic, and geochemical data and methods to the interpretation of past sedimentary environments, with emphasis on organism-sediment relationships. Processes, sediments, and organisms in modern depositional environments compared as analogs. Three class hours, one laboratory or field trip per week. Offered alternate years.
Prerequisite: GEOL 456 or consent of the instructor.

GEOL 558 History and Philosophy of Science (4)
A study of selected topics in the history and philosophy of science, and the application of these principles in analyzing contemporary scientific trends.
Prerequisite: GEOL 405 or consent of the instructor.

GEOL 575 Topics in Geology (1-4)

Review of current knowledge in specific areas of the earth sciences. Registration should indicate the specific topic to be studied. May be repeated for additional credit. Offered on demand.
Prerequisite: Consent of the instructor.
Staff.

GEOL 615 Seminar in Geology (1)

Selected topics dealing with recent developments, particularly reports of current research. Student presents one seminar during the quarter.
Staff.

GEOL 695 Special Problems in Geology (1-4)

A special project in the field, laboratory, museum, or library under the direction of a faculty member. Registration indicates the specific field of the project.
Prerequisite: Consent of the instructor.
Staff.

GEOL 697 Research (1-4)

GEOL 698 Thesis (1-4)

BIOL 500 + level courses as approved by advisement committee.

PHARMACOLOGY

FACULTY

IAN M. FRASER, PH.D. Cambridge University 1952
Chairman; Professor of Pharmacology
Drug metabolism, chemotherapy

MARVIN A. PETERS, PH.D. University of Iowa 1969
Program Coordinator; Professor of Pharmacology
Drug metabolism, biochemical pharmacology, neuropharmacology

ALLEN STROTHER, PH.D. Texas A and M University 1963
Professor of Pharmacology
Drug metabolism, biochemical pharmacology, nutrition

BERNARD E. TILTON, M.D., Loma Linda University SM 1948; PH.D. University of California, Los Angeles 1960
Professor of Pharmacology
Autonomic pharmacology, clinical pharmacology

C. RAYMOND CRESS, PH.D. Oregon State University 1970
Associate Professor of Pharmacology
Toxicology

DAVID A. HESSINGER, PH.D. University of Miami 1970
Associate Professor of Physiology/Pharmacology
Structure and function of cell membranes, marine toxicology

ASSOCIATE FACULTY

RALPH E. CUTLER, M.D. University of California, Los Angeles 1956
Professor of Pharmacology, Chief Clinical Pharmacology Section
Clinical pharmacology

DONALD I. PETERSON, M.D. Loma Linda University SM 1947
Associate Professor of Pharmacology
Neuropharmacology

BEATRIZ J. VASQUEZ, PH.D. University of San Luis, Argentina 1968
Associate Research Professor of Pharmacology
Psychobiology, neuropharmacology

PHARMACOLOGY PROGRAM

The program in pharmacology, in cooperation with other departments of the University, offers an interdisciplinary program with emphasis in cellular and molecular pharmacology or in systems pharmacology leading to the Doctor of Philosophy, concurrent D.D.S./Ph.D., or concurrent M.D./Ph.D. degree. The student may choose to emphasize either a cell and molecular pharmacology curriculum with selected interdisciplinary courses and seminars coordinated by the faculties in the Departments of Pharmacology, Biochemistry, and Microbiology; or a systems pharmacology curriculum with selected interdisciplinary courses and seminars coordinated by the faculties in the Departments of Pharmacology, Anatomy, and Physiology. These degree programs provide opportunities for qualified students to prepare for careers in teaching and research.

The incoming students must have completed the prerequisites or have made suitable arrangements to do so, as stated below and in the *Programs and Degrees* and the *Academic Practices* sections of division I of this BULLETIN.

Applicants for a graduate program in pharmacology are expected to have a baccalaureate degree with the following minimum units in their undergraduate preparation:

Biology, 8 quarter units
Chemistry, 20 quarter units (inclusive of general, quantitative, and organic chemistry)
Physics, 8 quarter units

With the consent of the department, applicants who do not meet the foregoing requirements may be admitted to the Graduate School on a provisional basis until the deficiencies are satisfied.

The optimum undergraduate preparation for a student to do well in graduate pharmacology is a major in chemistry with a minor in biology, or a biology major with a chemistry minor. Either combination should include a good background in elementary physics.

Applicants having completed a master's degree elsewhere may receive up to 48 quarter units of academic credit toward the doctoral degree. The amount of credit given will depend on the course work taken during the master's degree program.

DOCTOR OF PHILOSOPHY

A student may be admitted to a program of study toward the Doctor of Philosophy degree in pharmacology after having completed an undergraduate program as specified above or after successfully completing a master's degree in one of the natural sciences.

Incoming students will not be accepted into the program with the intent of completing a master's degree only. However, if a student pursuing a Ph.D. degree finds it impossible or undesirable to continue, a terminal master's degree may be awarded providing s/he has completed a minimum of 48 quarter units. Of this total, 30 units must be in pharmacology. The student may select 18 units of cognate courses in consultation with the departmental adviser. A maximum of 12 of the 30 units of pharmacology may be in research leading to the preparation and successful oral defense of a formal thesis, or the results may be in the form of a publishable scientific paper.

A student pursuing the Ph.D. degree will be required to take a minimum of four academic years of full-time work (approximately 100 quarter units). A minimum of 30 units of course work must be in the major field of study with an additional 26 to 43 units of course work in selected cognates. An additional 20 to 30 units of research, 4 units of seminar, and 3 to 4 units for writing and defense of the dissertation will also be required.

The candidate must take comprehensive written and oral examinations over the major field of study and prepare an acceptable dissertation based on the research program, as stated in section I of the Graduate School BULLETIN.

Combined programs In the combined programs, some Graduate School credit may be accepted for certain courses taken toward the professional degree. Consent for such credit must be obtained from the Department of Pharmacology and the Graduate School after the courses are completed with satisfactory grades. For a course taken in a professional curriculum to be accepted for graduate credit, the student must maintain the competence required for the respective graduate level.

General requirements For information about requirements and practices to which all graduate students are subject, the student should consult the *Academic Practices* section of division I of the Graduate School BULLETIN.

COURSES

PHRM 511, 512 General and Systematic Pharmacology I, II (6, 3)

Principles of drug action: drug receptors, absorption and fate of drugs, drug toxicity, and drug development. Systematic consideration of the pharmacology and the therapeutic value of the drugs used in medicine. Demonstration and laboratory exercises illustrating the effects of drugs in man or animals.

Staff.

PHRM 534 Topics in Pharmacology for Dentistry (2)
Lectures and discussions dealing with pharmacologic agents used in dentistry. Emphasis on the current agents used in dental anesthesia, both local and general. Offered on demand.
Fraser, Staff.

PHRM 535 Clinical Pharmacology (3)
Lectures, discussions, ward rounds, and/or laboratory exercises dealing with therapeutic problems related to common medicinal agents. Offered on demand.
Tilton, Staff.

PHRM 544 Topics in Advanced Pharmacology (3)
Lectures and discussions dealing with current advanced concepts in pharmacology, such as structure-action relationships, mechanisms of action, and metabolism and detoxification of therapeutic agents. Offered on demand.
Fraser, Staff.

PHRM 545 Laboratory in Advanced Pharmacology (1-2)
Experimental studies illustrating the didactic material presented in PHRM 544. Offered on demand.
Fraser, Staff.

PHRM 554 Neuropharmacology (4)
Systematic discussion of drugs that affect primarily the nervous system, with major emphasis on mechanism of action.
Tilton, Staff.

PHRM 555 Laboratory in Neuropharmacology (1)
Experimental studies illustrating the didactic material presented in PHRM 554.
Tilton, Staff.

PHRM 564 Cardiovascular and Renal Pharmacology (3)
Systematic discussion of drugs that affect primarily the cardiovascular and renal systems, with major emphasis on mechanism of action. Offered on demand.
Tilton, Staff.

PHRM 565 Laboratory in Cardiovascular and Renal Pharmacology (1)
Experimental studies illustrating the didactic material presented in PHRM 564. Offered on demand.
Tilton, Staff.

PHRM 574 Chemotherapy (3)
Systematic discussion of drugs that are used primarily in the treatment of infections, with major emphasis on mechanism of action. Offered on demand.
Fraser, Staff.

PHRM 575 Laboratory in Chemotherapy (1)
Experimental studies illustrating the didactic material presented in PHRM 574. Offered on demand.
Fraser, Staff.

PHRM 584 Drug Metabolism and Biochemical Pharmacology (3)
Detailed discussion of the fate of drugs in the body, together with related aspects of biochemical actions of drugs.
Strother, Staff.

PHRM 585 Laboratory in Drug Metabolism and Biochemical Pharmacology (1)
Experimental studies illustrating the didactic material presented in PHRM 584.
Strother, Peters.

PHRM 586 Toxicology (3)
Discussion of deleterious effects of drugs and common poisons. Measures that can be taken to combat poisoning. Offered on demand.
Cress, Staff.

PHRM 605 Integrative Biology Graduate Seminar (1)
This seminar, coordinated by the Departments of Anatomy and of Pharmacology and Physiology, consists of reports from current literature and the presentation of student and faculty research on various aspects of regulatory and integrative biology as applied to cells, tissues, organs, and systems. Both students and faculty are expected to participate in a discussion and critical evaluation of the presentation.

PHRM 684 Special Problems in Pharmacology (2-6)
Assignments in literature reviews and/or laboratory exercises.

PHRM 697 Research (1-6)

PHRM 698 Thesis (1-6)

PHRM 699 Dissertation (1-6)

PHYSICAL EDUCATION AND HEALTH

CLOSED TO ADMISSIONS, 1988-90

FACULTY

WALTER S. HAMERSLOUGH, ED.D. University of Oregon 1971
Chairman; Professor of Health and Physical Education
Exercise physiology, motor learning, philosophy

VERNON L. SCHEFFEL, D.P.E. Springfield College 1977
Professor of Health and Physical Education
History, sociology, statistics

NELSON E. THOMAS, PH.D. Florida State University 1974
Professor of Health and Physical Education
Psychology, sociology

ASSOCIATE FACULTY

WILLIAM J. NAPIER, PH.D. University of Southern California 1972
Professor of Health and Physical Education
History, literature

ROBERT K. SCHNEIDER, M.A. Loma Linda University 1974
Associate Professor of Health and Physical Education
Administration

The main objectives of the Master of Science degree graduate program in physical education and health are to assist students in attaining qualifications necessary for teaching in secondary schools and in colleges; to prepare students for research in physical education and health; to prepare students to develop and administer physical fitness programs in churches, schools, and industry; and to prepare students for advanced graduate study.

The applicant is normally expected to have a baccalaureate degree with a major in physical education or health from an accredited college. If the college record and test scores indicate any weaknesses or deficiencies, the student may be required to take additional preparatory undergraduate study.

Emphases are available in the following areas: secondary teaching, exercise science, fitness management

Degree requirements Degree requirements include:

1. A minimum of three quarters in residence as a graduate student. This may be met by attendance for three summers.
2. A minimum of 48 quarter units of graduate credit (at least 24 units must be courses numbered above 500) in physical education, health, and related fields.
3. Three units of religion.
4. A course in research methods.
5. Master's thesis or publishable paper; or comprehensive examinations.

The student who is preparing to teach should consult the credentials adviser in the School of Education for guidance.

For information about requirements and practices to which all graduate students are subject, the student should consult the *Academic Practices* section in division I of the Graduate School BULLETIN.

COURSES

UPPER DIVISION COURSES APPLICABLE TO GRADUATE PROGRAMS

HLED 314 Community Health (3)

HLED 317 Health and Society (3)

HLED 414 Mental Health and Drug Abuse Education (4)

HLED 415 Consumer Health and Disease (4)

HLED 416 Human Sexuality (2)

HLED 417 Safety Education (2)

HLED 464 Principles of Epidemiology (3)

HLED 473 Environmental Health (3)

PETH 344 Adaptive Physical Education (2)

PETH 408 Management of Physical Education and Intramural Programs (4)

PETH 418 Topics in Physical Education and Health (1-4)

PETH 424 Biomechanics (4)

PETH 426 Exercise Physiology (4)

PETH 427 Motor Learning (4)

PETH 429 Tests and Measurements (2-4)

PETH 444 Principles of Physical Fitness (2)

PETH 489 God-Man-Sport (4)

PETH 506 Philosophy of Physical Education (4)

PETH 508 Literature and Issues of Physical Education Programs (4)
A critical appraisal of contemporary trends and issues. Investigation and analysis of professional literature.

PETH 509 Curriculum and Facilities (4)
Steps in curriculum construction; planning, design, and evaluation of facilities.

PETH 514 Seminar in Physical Education and Health (1-4)
Course content may vary from year to year and may be repeated for credit.

PETH 524 Human Performance Laboratory (1-4)
Advanced techniques and analysis of selected motor skills.

PETH 526 Scientific Aspects of Physical Activity (4)
Current issues and problems in the area of biomechanics, exercise physiology, and sports medicine.

PETH 527 Psychology of Physical Activity (4)
Variables that influence athletic behavior.

PETH 528 Laboratory Techniques (4)
Use of equipment and techniques utilized in research.

PETH 555 Sociology of Sport (2)
Survey of sport as cultural phenomena, with emphasis on social values, personality, attitudes, competition, collective behavior, and group interaction.

PETH 564 History of Physical Education (2)
Genesis, development, events, and trends of physical education.

PETH 589 Research Methods (4)
Methods of scientific inquiry. Development and presentation of thesis proposal.

PETH 599 Directed Study (1-4)
Emphasis on research.

PETH 698 Thesis (4-6)

PHYSIOLOGY

FACULTY

JOHN LEONORA, PH.D. University of Wisconsin 1957
Cochairman; Professor of Physiology
Endocrinology

W. ROSS ADEY, M.D. University of Adelaide, Australia 1949
Distinguished Professor of Physiology
Neurophysiology

LAWRENCE D. LONGO, M.D. Loma Linda University SM 1954
Distinguished Professor of Gynecology/Obstetrics and Physiology
Placental exchange, fetal physiology

KENNETH A. ARENDT, PH.D. Boston University 1955
Professor of Physiology
Cardiovascular physiology, microcirculation

RAYMOND D. GILBERT, PH.D. University of Florida, Gainesville 1971
Professor of Physiology
Fetal cardiovascular physiology

SANDRA L. NEHLSEN-CANNARELLA, PH.D. National Institute for Medical Research, Medical Research Council, London, England 1971
Professor of Surgery and Microbiology; Research Professor of Pathology/Immunology

GORDON G. POWER, M.D. University of Pennsylvania 1961
Professor of Gynecology/Obstetrics and Physiology
Placental exchange, fetal physiology

ROBERT W. TEEL, PH.D. Loma Linda University GS 1972
Professor of Physiology
Cell physiology, differentiated cells in vitro

RAMON R. GONZALEZ, JR., PH.D. Wake Forest University 1973
Associate Professor of Physiology
Cardiovascular physiology, control of circulation

RAYMOND G. HALL, JR., PH.D. Loma Linda University GS 1968
Associate Professor of Physiology
Cell physiology

DAVID A. HESSINGER, PH.D. University of Miami 1970
Associate Professor of Physiology/Pharmacology
Structure and function of cell membranes, marine toxicology

ELWOOD S. McCLUSKEY, PH.D. Stanford University 1959
Associate Professor of Physiology
Comparative physiology

CHARLES A. DUCSAY, PH.D. University of Florida 1980
Assistant Professor of Physiology and Pediatrics
Reproductive physiology, endocrinology

GEORGE MAEDA, PH.D. Loma Linda University GS 1976
Assistant Professor of Physiology
Neurophysiology

JOHN W. PATRICKSON, PH.D. Howard University 1978
Assistant Professor of Anatomy and Physiology
Neurophysiology

DONALD R. RAFUSE, PH.D. Washington State University 1973
Assistant Professor of Physiology
Neural aspects of behavior

STEVEN M. YELLON, PH.D. University of Connecticut 1981
Assistant Professor of Physiology and Pediatrics
Reproductive endocrinology, neuroendocrinology, and biological rhythms

JEAN-MARC TIECHE, PH.D. Loma Linda University 1979
Assistant Research Professor of Physiology
Endocrinology

ASSOCIATE FACULTY

SUZANNE M. BAWIN, PH.D. University of California, Los Angeles 1972
Associate Research Professor of Physiology and Neurosurgery
Electrophysiological studies of epileptiform activity

ROBERT BOUCEK, M.D. University of Pittsburgh, Pennsylvania 1943
Distinguished Professor of Medicine
Cardiovascular physiology

NEAL S. BRICKER, M.D. University of Colorado 1949
Distinguished Professor of Medicine
Renal physiology

MURRAY E. BRANDSTATER, M.B.B.S. Melbourne University, Australia 1957
Professor of Rehabilitation Medicine
Neuromuscular physiology

WILLIAM H. FLETCHER, PH.D. University of California, Berkeley 1972
Professor of Anatomy and Physiology
Neurophysiology

SUBBURAMAN MOHAN, PH.D. University of Bangalore, India 1978
Assistant Professor of Physiology, Medicine, and Periodontics
Bone matrix proteins and growth factors

PHILIP J. ROOS, M.D. Loma Linda University SM 1976
Assistant Professor of Medicine and Physiology
Pulmonary physiology

PHYSIOLOGY PROGRAM

The graduate program in physiology provides a Christian environment in which Ph.D. candidates may pursue curricula oriented to their specific interests. Individual attention is assured by maintenance of a small student/faculty ratio.

Research opportunities are available in cell biology, cardiovascular, respiratory, neuro, reproductive, endocrine, exercise, bone, and neonatal physiology.

Prerequisite The equivalent of a major in one field of science or mathematics and a minor in another is prerequisite. Undergraduate courses should include zoology, chemistry through physical chemistry, and general physics. Mathematics through calculus is highly recommended.

Applicants having completed a master's degree elsewhere may receive up to 48 quarter units of academic credit toward the doctoral degree. The amount of credit given will depend on the course work taken during the master's degree program.

Doctor of Philosophy A student may be admitted to a program of study toward the Doctor of Philosophy degree in physiology after having completed an undergraduate program as specified above or after successfully completing a master's degree in one of the natural sciences.

Incoming students will not usually be accepted into the program with the intent of completing a master's degree only. However, if a student pursuing a Ph.D. degree finds it impossible or undesirable to continue, a terminal master's degree may be awarded providing s/he has completed a minimum of 48 quarter units. Of this total, 30 units must be in physiology. The student may select 18 units of cognate courses in consultation with the departmental adviser. A maximum of 12 of the 30 units of physiology may be in research leading to the preparation and successful oral defense of a formal thesis, or the results may be in the form of a publishable scientific paper.

A student pursuing the Ph.D. degree will be required to take a minimum of four academic years of full-time work (approximately 100 quarter units).

A minimum of 30 units of course work must be in the major field of study, with an additional 26 to 43 units of course work in selected cognates. An additional 20 to 30 units of research, 4 units of seminar, and 3 to 4 units for writing and defense of the dissertation will also be required.

The candidate must take comprehensive written and oral examinations over the major field of study and prepare an acceptable dissertation based on the research program, as stated in section I of this BULLETIN.

The program in physiology, in cooperation with other departments of the University, offers an interdisciplinary program with emphasis in systems physiology leading to the Doctor of Philosophy, concurrent D.D.S./Ph.D., or concurrent M.D./Ph.D. degree. The systems physiology curriculum includes selected interdisciplinary courses and seminars coordinated by the faculties in the Departments of Physiology, Anatomy, and Pharmacology.

Combined programs In the combined programs, some Graduate School credit may be accepted for certain courses taken toward the professional degree. Consent for such credit must be obtained from the program in physiology and the Graduate School after the courses are completed with satisfactory grades. For a course taken in a professional curriculum to be accepted for graduate credit, the student must maintain the competence required for the respective graduate level.

General requirements For information about requirements and practices to which all graduate students are subject, the student should consult the *Academic Practices* section of division I of the Graduate School BULLETIN.

COURSES

PHSL 511, 512 Medical Physiology I, II (6, 6)
The physiological basis of normal and selected pathological conditions, modern concepts of homeostasis and negative feedback control systems. Utilization of modern electronic instrumentation to study function in man or experimental animals in laboratory sessions.
Staff.

PHSL 521, 522 Lectures in Physiology I, II (5, 5)
Lectures from PHSL 511, 512.
Staff.

PHSL 533, 534 Physiology I, II (4, 3)
Study of basic human physiology at the cellular and systemic levels, and of pathological conditions. Laboratory sessions utilizing modern electronic instrumentation to study function in man and experimental animals. Designed for students in all applied and basic sciences, except physiology.
Hall.

PHSL 535 Comparative Physiology (5)

A comparison of the major animal groups, from protozoa to mammals, with emphasis on analysis of diversity. Lecture four units, laboratory one unit. Offered alternate years; 1989-90.

Prerequisite: Zoology (preferably invertebrate), physiology (or biochemistry).

McCluskey.

PHSL 537 Neuroscience (8)

An integated approach to the fundamentals of neuroanatomy and neurophysiology, with applications to clinical neurology.

PHSL 541 Cell and Molecular Biology (4)

Life processes fundamental to animal, plant, and microorganism; a graduate-level introduction. Lecture three units, laboratory one unit each term. Offered alternate years; 1990-91.

Prerequisite: Organic chemistry and one of the following: biochemistry, molecular biology, or cell biology. Physics desirable.

McCluskey, Hall.

Courses 550-587 are advanced lecture and conference courses exploring the latest concepts in the respective area. Prerequisite or concurrent: PHSL 511, 512, or the equivalent.

PHSL 550 Properties of the Nervous System (3)

A critical analysis of current neurophysiological data attempting to characterize the vertebrate nervous system. Emphasis on selected topics covering neuronal topology, intracellular recordings, ultrastructure, evoked potentials, and neurotransmitter chemistry. Offered alternate years; 1989-90.

Prerequisite: Consent of the instructor.

Maeda.

PHSL 553 Applied Electronics for the Basic Sciences (4)

An introduction to basic electronics from an applications viewpoint, with lectures and laboratories aimed at enhancing the use of research instrumentation in the biological sciences. Using integrated circuits and other components, students will design, build, and test some simple circuits which are often part of the overall equipment in their laboratory. Offered alternate years; 1989-90.

Prerequisite: General physics and calculus.

Maeda.

PHSL 555 Biology of Cancer (lecture) (3)

An interdisciplinary approach to the study of the causation, characterization, and prevention of cancer. Offered alternate years; 1988-89.

Teel, Hall.

PHSL 556 Biology of Cancer (laboratory) (2)

An introduction to techniques essential to research investigations in cancer. Offered alternate years; 1988-89.

Teel, Hall.

PHSL 558 Physiology of Exercise and Inactivity (3)

The effects of exercise and inactivity on the physiological systems of the body, including the skeletal, muscular, cardiovascular, respiratory, and others. Emphasis at the cellular and molecular levels. Study not only of immediate changes in the body necessary to meet the demands of exercise, but also the long-term adaptive changes. Offered alternate years; 1989-90.

Prerequisite: Medical physiology.

Hall.

PHSL 567 Respiratory Physiology (3)

An intensive course encouraging student participation in the principles and application of functional anatomy, gaseous physics, and diffusional processes; respiratory mechanics, blood gases and reaction kinetics; uneven ventilation/blood flow, high altitude, exercise and pulmonary function testing. Original reference reading required. Open to graduate, medical, and other students and technicians with experience in and commitment to the field. Offered alternate years; 1988-89.

Longo, Power.

PHSL 569 Oxygenation of the Fetus and Newborn (2)

The dynamics and control of oxygen delivery to tissues. Exploration of any or all the steps in the pathway linking blood oxygen transport, control of blood flow to the brain and other organs, theoretical and experimental aspects of oxygen diffusion in tissues, and the control of cellular respiration. Offered alternate years; 1988-89.

Longo.

PHSL 577 Cardiac Physiology (3)

A didactic course dealing with the developmental, transitional, and adult anatomy of the heart, as well as its electrical, mechanical, and metabolic processes in health and disease.

Prerequisite: An advanced physiology course or consent of the instructor. Offered alternate years; 1988-89.

Gonzalez.

PHSL 578 Vascular Physiology (3)

A study of the physical principles which govern flow of fluids (rheology), the functional anatomy, and the reflexes of the peripheral circulation. Also considered is the role of the peripheral vasculature in the control of cardiac output and blood flow to special regions such as the brain, heart, skeletal muscle, etc. Offered alternate years.

Prerequisite: An advanced physiology course or permission of the instructor.

Gilbert.

PHSL 579 Classic Readings in Circulatory Physiology (2)

An analysis of the pathology of scientific discovery in gaining an understanding of the dynamics and control of the cardiovascular system. Reading and discussion of some of the landmark works in the field, including those of William Harvey, Richard Lower, Stephen Hales, Jean L. M. Poiseville, Carl F. W. Ludwig, Claude Bernard, Otto Frank, Ernest H. Starling, and others. Offered alternate years; 1989-90.

Prerequisite: Medical Physiology 511, 512; or equivalent.

Longo.

PHSL 584 Readings in Neurophysiology (2)

A seminar tracing the development of twentieth-century ideas about the nervous system. The writings of three early neurobiologists (Sherrington, Pavlov, Herrick) emphasized in context with classical and current understanding of the nervous system.

Prerequisite: Consent of the instructor.

Maeda.

PHSL 585 Endocrinology (3)

A study of the physiologic effects of hormones secreted by the hypothalamus, pituitary, thyroid, adrenals, parathyroids, and pancreas. Emphasis on the specific effects on carbohydrate, protein, lipid, water, and electrolyte metabolism. Offered alternate years; 1989-90.

Leonora.

PHSL 586 Endocrinology of the Fetus (2)

A study of the normal and abnormal physiology of the developing fetus and neonate. Emphasis on problems of placental exchange, placental and fetal circulation, and blood gases; papers and current investigative work. Offered alternate years; 1988-89.

Longo, Power.

PHSL 587 Physiology of Reproduction (2)

A study of the development of the male and female reproductive systems, neural and hormonal control of reproductive function, fetal development, and parturition. Offered alternate years; 1988-89.

Yellon, Ducsay.

PHSL 595 Readings in Physiology (arranged)

Assigned reading and conferences on special problems in physiology.

Staff.

PHSL 596 Readings in Comparative Physiology (1)

Critical analysis of selected current or classic papers. Content variable. May be repeated for additional credit. Offered alternate years; 1989-90.

Prerequisite: A course in physiology.

McCluskey.

PHSL 597 Great Books in Physiology (1)

Critical and descriptive reports (written and oral) of books on a graduate reading list. McCluskey.

PHSL 605 Integrative Biology Graduate Seminar (1)

This seminar, coordinated by the Departments of Anatomy and of Pharmacology and Physiology, consists of reports from current literature and the presentation of student and faculty research on various aspects of regulatory and intregrative biology as applied to cells, tissues, organs, and systems. Both students and faculty are expected to participate in a discussion and critical evaluation of the presentation.

PHSL 694 Special Problems in Physiology (arranged)

PHSL 697 Research (1-18)

PHSL 698 Thesis (1)

PHSL 699 Dissertation (2)

RELIGION

FACULTY

KENNETH L. VINE, PH.D. University of Michigan 1965
Dean; Professor of Biblical Studies
Archaeology and Old Testament

NIELS-ERIK ANDREASEN, PH.D. Vanderbilt University 1971
Associate Dean; Professor of Old Testament
Old Testament

DALTON D. BALDWIN, PH.D. Claremont Graduate School 1975
Professor of Christian Theology
Theology

IVAN BLAZEN, PH.D. Princeton Theological Seminary 1979
Professor of New Testament
New Testament

V. BAILEY GILLESPIE, PH.D. Claremont Graduate School 1973
Professor of Theology and Christian Personality
Theology/Christian nurture

PAUL J. LANDA, PH.D. Vanderbilt University 1976
Professor of Church History
Church history

T. RICHARD RICE, PH.D. University of Chicago Divinity School 1974
Professor of Theology
Theology

CHARLES W. TEEL, JR. PH.D. Boston University 1972
Professor of Religion and Sociology
Religion and society

GERALD WINSLOW, PH.D. Graduate Theological Union 1981
Professor of Christian Ethics
Christian ethics

RONALD GRAYBILL, PH.D. Johns Hopkins University 1984
Associate Professor of Church History
Church history

DAVID R. LARSON, PH.D. Claremont Graduate School 1982
Associate Professor of Christian Ethics
Christian ethics

JAMES W. WALTERS, PH.D. Claremont Graduate School 1979
Associate Professor of Religion and Christian Ethics
Christian ethics

EDWIN ZACKRISON, PH.D. Andrews University 1983
Associate Professor of Theology and Ministry
Ministry and religious education

ASSOCIATE FACULTY

WILBER ALEXANDER, PH.D. Michigan State University 1962
Clinical ministry

M. JERRY DAVIS, REL.D. School of Theology at Claremont 1967
Clinical ministry/chaplain training

FRITZ GUY, PH.D. University of Chicago Divinity School 1971
Theology

A. GRAHAM MAXWELL, PH.D. University of Chicago Divinity School 1959
New Testament

V. NORSKOV OLSEN, PH.D. University of London 1966; DR. THEOL. University of Basel 1968
Church history

JACK W. PROVONSHA, M.D. Loma Linda University 1953; PH.D. Claremont Graduate School
Christian ethics

LOUIS VENDEN, PH.D. Princeton Theological Seminary 1979
Applied theology

PROGRAMS

Purpose Graduate programs in religion underscore the University's recognition of religion as a scholarly discipline. They provide the proper context for continuing research and writing endeavors by competent students who are interested in furthering their education and in contributing to the overall scholarly thrust of the church. More specifically, the programs are designed to:

1. Enable interested individuals to obtain advanced training in religion to meet the constant and growing demands of the church.
2. Assist prospective teachers in attaining the basic qualifications essential for teaching religion in secondary schools and provide the basis for further graduate education in religion.

3. Aid in equipping lay persons for leadership roles in their respective home churches.

4. Cooperate with the Seventh-day Adventist Theological Seminary in meeting the needs and demands for the continuing education of the pastors and teaching ministers in the Pacific Union.

5. Provide students in the professional schools of the University an opportunity to explore the close relationship of religion to the healing arts.

The School of Religion prepares students for the Master of Arts degree with courses in biblical studies, Christian ethics, church and ministry, church history, religious education, and theology.

MASTER OF ARTS (RELIGION)

Graduation requirements 1. A total of 48 units of graduate credit, with at least 28 units in courses numbered 500-699. Up to 9 units of credit may be transferred from an approved graduate program.

2. One course in research methods for religious studies and one course in scholarly writing. Students who come with the necessary skills as demonstrated in honors papers, theses, or publications may apply for exemption from this requirement.

3. A reading tutorial in the area of specialization and two graduate seminars.

4. A grade point average of B (3.00) or better, no grade less than C (2.0).

5. A reading proficiency in a modern or classical foreign language (for students specializing in Bible or church history).

6. Satisfactory performance on a written comprehensive examination in the candidate's field(s) of study.

7. A thesis (4 units of credit) or two major papers originally prepared for graduate seminars, but revised to the satisfaction of the student's guidance committee.

Curricula of instruction The student may, in consultation with the adviser, select courses from the following areas of specialization: biblical studies, Christian ethics, church history, church and ministry, and theology. Prospective religion teachers may select a curriculum in religious education to include biblical studies (8 units), church history (8 units), ethics and theology (8 units), religious education and nurture (20 units), to be chosen from the following: RELT 564; RELP 515, 568, 586, 615; EDCI 547, 574.

General requirements For information about requirements and practices to which all graduate students are subject, the student should consult the *Academic Practices* section of division I of the Graduate School BULLETIN.

Credentials and licenses The following programs leading to professional certification are available at Loma Linda University:

1. TEACHING CREDENTIALS Graduate students in religious education may earn denominational teaching credentials from the Office of Education in the North American Division of Seventh-day Adventists. The requirements for these credentials are met by courses in biblical studies, historical studies, theological and ethical studies, and by the following courses available through the School of Education: EDFO 305, 404; EDCI 414, 433 (3 units), 456 (9 units), 574. For further information, contact the School of Education, Loma Linda University.

2. CLINICAL PASTORAL EDUCATION In the setting of the University Medical Center, the University makes available a program in clinical pastoral education approved by the Association for Clinical Pastoral Education, Inc., an interdenominational body that certifies ministers and seminary students for the clinical experience. The applicant should be a graduate of an accredited college and should have completed at least one year at a theological seminary, with courses in pastoral counseling and psychology. Students who wish graduate credit must meet the entrance requirements of the Graduate School. Questions should be addressed to the Chaplain Supervisor, Loma Linda University Medical Center, Loma Linda, California 92350.

3. FAMILY-LIFE CERTIFICATE Graduates with a Master of Arts degree in religion may qualify as family-life educators by completing the following special courses or their equivalent: FMED 514, 528, 529, 614, 695; MFAM 614, 656C, 699; SOCI 414, 444.

4. CLINICAL BIOMEDICAL ETHICS The School of Religion, in cooperation with the School of Medicine, the Medical Center, and the Center for Christian Bioethics offers an intensive introduction to ethical theories with applications that lead to eight quarter units of graduate credit or a certificate in clinical biomedical ethics or both. This experience of eight weeks of full-time study and participation in the life of the Medical Center provides an unusual opportunity for students and professionals to study ethics in a clinical setting. This program is offered during the winter quarter of each year. The final deadline for application is November 1. For additional information, prospective students should contact the program director, Dr. Gerald Winslow.

Courses of instruction Graduate students will normally choose courses numbered between 500-699. Certain advanced upper division undergraduate courses (numbered 400-499) are also acceptable for graduate credit. Unless specified in a curriculum, such undergraduate courses should be selected *only* in consultation with a School of Religion adviser (for a listing of advanced upper division undergraduate courses, refer to the School of Religion BULLETIN). Students who anticipate having to transfer graduate

credits from Loma Linda University to professional or graduate programs in other schools of religion or theological seminaries should know that ordinarily only courses numbered 500-699 will be acceptable as graduate transfer credit.

Special resources and collections The following entities contribute significantly to graduate studies in religion.

1. *Center for Christian Bioethics* This center, established in 1983 on the Loma Linda campus, is staffed by School of Religion faculty members and supported by an endowment. It offers continuing education, workshops, lectures, and consultations to hospitals, medical centers, and church institutions; and invites graduate students in religion with an interest in Christian ethics to use its resources and participate in its work.

2. *Special collections* The University libraries house two Seventh-day Adventist Heritage Rooms, an E. G. White Estate Branch Office on the Loma Linda campus, and an E. G. White Estate Study Center on the La Sierra campus. Staffed by trained librarians, these special collections are available to graduate students for research in the areas of Seventh-day Adventist history and theology.

COURSES

BIBLICAL STUDIES

RELB 505 The Making of the Bible (3-4)
The writing of the sacred books, their collection into one book, their transmission in handwritten form, and their translation into today's languages.

RELB 545 Biblical Archaeology (3-4)
The Bible in its religious, cultural, and political environment as illuminated by discoveries of modern archaeology.

RELB 558 Old Testament Theology (4)
The major theological concepts of the Old Testament, with a view to their impact on Christian life and thought.

RELB 559 New Testament Theology (4)
An examination of the major theological themes of the teachings of Jesus as set forth in the Gospels, the Kerygma of the primitive Church, the letters of Paul, and the Johannine writings.

RELB 564 The Letter to the Romans (3-4)
An introduction to the book, with an exegesis of its text and consideration of its major theological themes.

RELB 568 The Letter to the Hebrews (3-4)
An introduction to the book, with an exegesis of its text and a consideration of the major theological themes presented.

RELB 614 Old Testament Seminar (3-4)
May be repeated up to 12 units.
Prerequisite: Consent of the instructor.

RELB 624 New Testament Seminar (3-4)
May be repeated up to 12 units.
Prerequisite: Consent of the instructor.

RELB 630 Fieldwork in Middle East Archaeology (1-8)
Prerequisite: Consent of the instructor.

RELB 674 Reading Tutorial in Biblical Studies (3-4)
Prerequisite: Consent of the instructor.

RELB 698 Thesis in Biblical Studies (4)

RELB 699 Directed Study (2-6)
Prerequisite: Consent of the instructor.

CHRISTIAN ETHICS

RELE 524 Christian Bioethics (3-4)
Designed to give the graduate student an in-depth acquaintance with current bioethical issues such as abortion, mind control, procreation and genetic engineering, and life manipulation.

RELE 534 Ethical Issues in Public Health (3-4)
Theoretical and practical appraisals of the ethical alternatives encountered by public health administrators, educators, and investigators.

RELE 545 Sociology of Religion (3-4)
A descriptive examination of church as a social institution. Dynamics of change as a religious movement evolves toward a religious institution. Models of relationship between church and world. Content analysis of sectarian characteristics in the early *Review and Herald* periodicals.

RELE 548 Christian Social Ethics (3-4)
An in-depth opportunity for the graduate student to discover what are the implications of Christian belief for selected problems in social ethical theory and practice.

RELE 554 Clinical Intensive in Biomedical Ethics (8)
An intensive study of the theories and applications of clinical biomedical ethics.

RELE 577 Theological Ethics (3-4)
Ethical dimensions of theological positions advocated in the twentieth century.

RELE 588 Types of Ethical Theory (3-4)
A critical analysis of the basic theories propounded in philosophical ethics. A study of the writings of major ethical theorists, including Plato, Aristotle, I. Kant, and J. S. Mill. A consideration of philosophical ethics as compared with the Christian faith and Seventh-day Adventism.

RELE 624 Seminar in Christian Ethics (3-4)
Prerequisite: Consent of the instructor.

RELE 674 Reading Tutorial in Christian Ethics (3-4)
Prerequisite: Consent of the instructor.

RELE 694 Colloquium in Christian Ethics (1)
Monthly discussions of topics and issues pertinent to graduate students and faculty in Christian ethics. May be repeated to a maximum of four units.

RELE 698 Thesis (4)

RELE 699 Directed Study (2-6)
Prerequisite: Consent of the instructor.

RELP 504 Research Methods in Religion (4)

Philosophical presuppositions and methods used in the field of religion. Basic resources and procedures for scholarly research. The use of the library as a research center. Bibliography in the various religious disciplines. The construction of term papers and theses; advanced techniques and practice of expository and persuasive writing.

RELP 514 Fieldwork in Educational Ministry (1)

Practice in teaching in an educational setting, interaction with students in a learning setting either in a school or a church. May be repeated for additional credit to a maximum of 3 units.

Prerequisite: RELP 468.

RELP 515 Youth Ministry and the Local Church (3)

Designed to provide insight into the theology, organization, and methods of local youth ministry. The problem of what to do in the local setting with youth as they grow toward God. Consideration of the problems of leadership, activities, models of ministry, and current materials available.

RELP 524 Clinical Pastoral Education (6-12)

A twelve-week course for church pastors and seminary students, including supervised experience with patients, lectures by hospital staff, seminars, conferences, and hospital rounds with physicians. Five eight-hour days per week. Limited enrollment.

Prerequisite: Consent of the instructor and the director of the program.

Credit earned in this course is recognized by the Association for Clinical Pastoral Education, Incorporated. A maximum of 6 units of credit may be applicable to a Master of Arts degree in religion. A qualified student wishing to earn credit in clinical pastoral education must receive permission from the graduate advisers and the Graduate School Admissions Committee prior to enrollment.

RELP 525 Fieldwork in Pastoral Ministry (1)

Practical application of the practice of ministry into an overall theory of ministry. May be repeated for additional credit to a maximum of 3 units.

Prerequisite: Consent of the instructor.

RELP 527 Crisis Counseling (3-4)

Crisis phenomena, current crisis theory, a Christian model of crisis care, and the dynamics and practices of crisis care.

RELP 536 Pastoral Counseling (3)

The biblical and theological bases of and methodologies for pastoral counseling as it relates to the unique role of ministers.

RELP 539 Theology of Ministry (3-4)

Biblical and theological bases of and methods for helping relationships as they relate to the unique role of the ministry.

RELP 544 Theology, Encounter, and Family Therapy (3-4)

A study of the basic foundations of traditional Christian theology as they relate to the development of personality and provide a basis for effective living. Evaluation of relational processes in the light of ethical, moral, and value decisions.

RELP 564 Religion, Marriage, and the Family (3)

The family in historical, theological, and ethical perspectives; Christian assessments of contemporary theories regarding the family; religious and secular resources for preventing and resolving family crises.

RELP 568 Methods of Educational Ministry (3)

A critical examination of the foundations, theories, and practices of Christian education as an aspect of ministry. Emphasis on practical application of theology and religious development as it relates to the educational setting. Development of materials for secondary Bible teaching.

Prerequisite: RELT 564.

RELP 569 Methods in Health Evangelism (3-4)

Effective methods through which health professionals can use their training to make the evangelistic outreach of the church more effective through medical practices, hospitals, and church-based health programs.

RELP 586 Moral Learning and Values in Religious Formation (3)

A critical, in-depth examination of faith emergence, value formation, and moral growth. A study of the major theorists as they relate to religious development, including Fowler, Kohlberg, Simons, James, and Sherrill.

RELP 604 Seminar in Church and Ministry (3-4)

Prerequisite: Consent of the instructor.

RELP 605 Seminar in Personal Evangelism (1)

A practical seminar in which the student gains experience in giving Bible studies to interested people in the community under the guidance of the instructor. May be repeated for additional credit to a maximum of 3 units.

RELP 606 Seminar in Worship (3-4)

RELP 607 Seminar in Pastoral Counseling (3-4)

RELP 674 Reading Tutorial in Professional Studies (3-4)

Prerequisite: Consent of the instructor.

RELP 694B Seminar in Counseling Adventist Youth (3)

A practical study of the concepts of biblical counseling, with emphasis on issues of moral concern and values development for modern Christian youth. Identical to EDCE 694B.

RELP 698 Thesis (4)

RELP 699 Directed Study (2-6)

Prerequisite: Consent of the instructor.

THEOLOGICAL AND HISTORICAL STUDIES

RELT 506 Seventh-day Adventist Beliefs and Life (2-3)

Introduction to beliefs and lifestyle in Seventh-day Adventism. Limited to students who are not members of the Seventh-day Adventist church. Offered on demand.

RELT 536 Religious Belief and the Modern World (3-4)

Reality and relevance of God for contemporary man.

RELT 538 The Doctrine of Man (3-4)

The Christian understanding of the nature and destiny of human beings. Anthropological concepts in the Bible and in Christian thought.

RELT 539 The Doctrine of God (3-4)

Study of the nature and attributes of God, the trinitarian concept of God, and God's relation to the temporal world.

RELT 548 The Doctrine of Christ (3-4)

Study of the person and work of Christ. Attention given to the nature of Christ and his atoning work in his life on earth, his death on the cross, and his intercession in the heavenly sanctuary.

RELT 564 Religious Development and Nurture (4)

Biblical principles of emerging self-identity and faith concepts. Religious development of children, adolescents, and youth. Religious learning problems and practical methodologies in communicating religious values.

RELT 604 Seminar in Religion and Science (3-4)

Prerequisite: Consent of the instructor.

RELT 614 Seminar in Theological Studies (3-4)
May be repeated up to 12 units.
Prerequisite: Consent of the instructor.

RELT 615 Seminar in Philosophy of Religion (3-4)
Offered on demand.
Prerequisite: Consent of the instructor.

RELT 616 Seminar in Religious Experience (3-4)
Offered on demand.
Prerequisite: Consent of the instructor.

RELT 674 Reading Tutorial in Theological Studies (3-4)
Prerequisite: Consent of the instructor.

RELT 698 Thesis (4)

RELT 699 Directed Study (2-6)
Prerequisite: Consent of the instructor.

HISTORICAL STUDIES

RELH 566 The Early Christian Church (3-4)
Study from primary sources of the important men, developments, and ideas in the Christian church from apostolic times through the fifth century A.D. Offered alternate years. Identical to HIST 566.

RELH 568 History of the Papacy and Roman Catholicism (3-4)
Historical and theological development of the Papacy and Roman Catholicism during the patristic, medieval, and modern periods. Offered alternate years. Identical to HIST 568.

RELH 574 The Lutheran Reformation (3-4)
A study of Martin Luther, his theology, and the Reformation movement he initiated down to 1555. Offered alternate years. Identical to HIST 574.

RELH 576 The Swiss Reformation and Calvinism (3-4)
Leading men and movements of the Swiss Reformation, with particular emphasis on John Calvin and the theological and sociological legacy of Calvinism. Offered alternate years. Identical to HIST 576.

RELH 578 The English Reformation (3-4)
Main historical forces and religious movements of the English Reformation until the Westminster Assembly. Offered alternate years. Identical to HIST 578.

RELH 585 History of Seventh-day Adventism (3-4)
A study of major doctrinal and organizational developments within Seventh-day Adventism from its Millerite origins to 1922. Identical to HIST 585.

RELH 586 Ellen G. White: Her Life and Thought (3-4)
A study of the key events in the life of Ellen G. White (1827-1915) and her major theological contribution. Offered alternate years. Identical to HIST 586.

RELH 604 Seminar: Problems in the History of Seventh-day Adventist Theology (3-4)
Prerequisite: Consent of the instructor.

RELH 635 Seminar in Church History (4)
Prerequisite: Consent of the instructor.

RELH 674 Reading Tutorial in Historical Studies (3-4)
Prerequisite: Consent of the instructor.

RELH 698 Thesis (4)

RELH 699 Directed Study (2-6)
Prerequisite: Consent of the instructor.

RELM 534 Anthropology of Mission (3)

A study of mission, applying the findings of anthropology as they relate to cultural change. The processes of religious development, the means of diffusion, the factors affecting religious acculturation, and the analysis from case studies of programs planned to direct changes in religion.

RELM 564 Theology of Mission (3)

A study of the biblical theology applied to defining the concerns, structures, and methods of mission. Mission as a general function of the church and as specific activities related to persons, time, and place. Topics include the idea of the church, the definition of missionary, the priorities of mission, and the place of eschatology.

RELM 624 Seminar: Mission Studies (2-4)

Prerequisite: Consent of the instructor.

SPEECH-LANGUAGE PATHOLOGY

FACULTY

JEAN B. LOWRY, PH.D. Kent State University 1973
Chairman; Associate Professor of Speech-Language Pathology and Audiology
Adult aphasia, phonology

JEAN E. MAKI, PH.D. Michigan State University 1975
Associate Professor of Speech-Language Pathology and Audiology
Speech and hearing science, deafness

PATRICIA M. HENDRYX, PH.D. Northwestern University 1987
Assistant Professor of Speech-Language Pathology and Audiology
Adult aphasia, cognative rehabilitation

KEIKO I. KHOO, M.S. Loma Linda University GS 1979
Assistant Professor of Speech-Language Pathology and Audiology
Diagnostic and rehabilitative audiology

ANN E. RATCLIFF, PH.D. University of Wisconsin, Madison 1987
Assistant Professor of Speech-Language Pathology and Audiology
Childhood language, augmentative communication, research methods

The purposes of this graduate program are to offer preparation for careers in the professional practice of speech-language pathology, to provide a basis for graduate study and research at a more advanced level, and to encourage the development of capacity for independent growth. The courses are designed to (*a*) increase understanding in the basic sciences of communication, (*b*) develop competence in the practice of speech-language pathology and audiology, and (*c*) promote a sense of responsibility toward the speech, language, and hearing handicapped and toward the community.

The clinical services of the Deparment of Speech-Language Pathology and Audiology, the Loma Linda University Medical Center, and of affiliated facilities provide opportunity to obtain breadth of experience in a variety of settings. Summer and/or September placement may be required for clinical practicum. Study in related disciplines at the advanced level is available through the offerings of departments of the College of Arts and Sciences, the professional schools of the University, and the Graduate School.

Admission Acceptable undergraduate preparation includes a bachelor's degree in speech-language pathology and audiology or communicative disorders. Applicants having an undergraduate degree from another discipline may be admitted to the graduate program. However, they must complete undergraduate course work as specified by the departmental faculty before being advanced to candidacy for the master's degree.

Program Graduate study in speech-language pathology leads to the Master of Science degree. The program provides opportunity for the graduate (*a*) to satisfy all academic and clinical requirements for the Certificate of Clinical Competence and the California License in Speech-Language Pathology, or (b) to prepare for doctoral study or careers in related fields.

The program does not offer a master's degree in audiology. Courses and clinical practicum are available for students wishing to increase their breadth of knowledge and experience in audiology.

The speech-language pathology program is approved by the Commission for Teacher Credentialing to prepare students for a California Clinical Rehabilitative Services Credential in Language, Speech, and Hearing. This credential is a requirement for working as a speech, language, and hearing specialist in California public schools. Course requirements for the credential vary from those listed for the degree. Credential requirements may be obtained by contacting the department. Students may elect to complete requirements for the credential only. In this case, the student would substitute Student Teaching (SPPA 588) for the graduate courses in Research

Methods and Professional Literature (SPPA 598) and the Seminar in Adult Language Literature (SPPA 684). In addition, the student's undergraduate course work must be evaluated in accordance with state of California credential requirements.

The program of study consists of completing (*a*) required graduate-level courses, (*b*) supervised clinical practice, and (*c*) research or comprehensive examinations.

DEGREE REQUIREMENTS

The following are requirements for the Master of Science degree specific to this program:

1. A minimum of one quarter in residence as a graduate student.
2. A minimum of 48 quarter units of graduate credit, including: SPPA 524, 525, 554, 564, 576, 577, 585, 598, 683, 684, 685, 688, religion (one course).
3. Evidence that the student has completed 300 clock hours of supervised clinical practice, including 150 clock hours at the graduate level. All students must complete a minimum of 50 clock hours of practicum as arranged by the department faculty.
4. Master's thesis/project or comprehensive examinations.
5. Students selecting the thesis/project option must demonstrate a working knowledge of statistics or pass a graduate statistics course.

Option A: Research Option A requires completion of 6 units of SPPA 698 Thesis, and an oral examination; or completion of 4 units of SPPA 697 Research and an oral presentation of research.

Option B: Comprehensive Examinations Option B requires completion of written comprehensive examinations.

General requirements For information about requirements and practices to which all graduate students are subject, the student should consult the *Academic Practices* section of division I of the Graduate School BULLETIN.

COURSES

GRADUATE COURSES

SPPA 524 Language Disorders of Children, Advanced (3)
Lectures and discussions dealing with assessment and management of the preschool, primary, and adolescent school-age child with language disabilities. A study of the classic and contemporary literature relating to differential diagnosis and therapeutic procedures. Consideration given to language disabilities of childhood, learning disabilities, autism, and mental retardation.

SPPA 525 Motor Speech Disorders: Speech and Nonspeech Considerations (3)
Discussion of the differential diagnosis and clinical management of motor speech disorders in children and adults. Exploration of the decision-making process in selection of speech and/or nonspeech communication modes.

SPPA 527 Curriculum Development in the Communicatively Handicapped Classroom (3)
Description of methods, techniques, and strategies for establishing and maintaining an integrated educational program for the severely language-handicapped child. Covers classroom organization and structure, scheduling, behavioral management techniques, effective utilization of instructional aides and other support personnel.

SPPA 554 Advanced Audiological Assessment (3)
Study of the application of psychoacoustics and instrumentation to the selection and use of hearing tests. Experience in the administration of tests for intensive diagnostic and rehabilitation purposes. Measurement and methodology.

SPPA 564 Auditory Rehabilitation and Hearing Aids (3)
Study of the mechanisms for achieving hearing rehabilitation, including amplification, speech reading, auditory training, hearing aid orientation, and speech conservation. Consideration given to hearing aid function and philosophies of rehabilitation for the hearing impaired (e.g., auditory, aural, manual, and total communication).

SPPA 567 Clinical Practice in Speech-Language Pathology/Audiology, Advanced (1-6)
Supervised practice in diagnosis and therapy. Thirty clock hours required for each unit of credit. Maximum of 6 units of clinical practicum apply toward a major in speech-language pathology and audiology. Consent of the supervisor.

SPPA 568 Clinical Practice in Speech-Language Pathology Diagnostics (1-3)
Supervised practice in diagnosis; study of the principles of diagnosis applicable to communication.

SPPA 576 Speech and Hearing Science (3)
Lecture, discussion, and laboratory experience in the areas of speech acoustics, speech production and perception, psychoacoustics, and speech and hearing physiology.

SPPA 577 Applied Psycholinguistics (3)
Mental processes underlying the acquisition and use of language; structure and meaning of language; perception and cognition.
Prerequisite: Consent of the instructor.

SPPA 585 Professional Aspects of Speech-Language Pathology and Audiology (3)
Study of the ethical, business, and legal considerations in organizing and administering programs, including accountability, record keeping, case selection, case load, supervision, staffing, budgeting, and interagency cooperation in schools, clinics, and private practice.

SPPA 588 Directed Teaching in Speech-Language Pathology (4-12)
Supervised therapy on the elementary and/or secondary level and/or in a classroom for the severely language-handicapped child. Not more than 6 units of clinical practicum are applicable toward the master's degree. This includes directed teaching.

SPPA 596 Workshop in Speech-Language Pathology/Audiology (1-4)
May be repeated with new content for additional credit.

SPPA 598 Research Methods and Professional Literature in Speech-Language Pathology (3)
Lecture and discussion designed to facilitate the student's ability to read and interpret professional literature, develop research ideas, and develop professional writing skills.

SEMINARS. Analysis of current literature relating to theory, research, and applications within the area of consideration.

Prerequisite: A content course in which the area of consideration has been studied, or consent of the instructor.

SPPA 683 Seminar: Voice Disorders/Cleft Palate (3)

SPPA 684 Seminar: Adult Language Disorders (3)

SPPA 685 Seminar: Stuttering (3)

SPPA 687 Seminar: Open Seminar (3)

SPPA 688 Seminar: Articulation (3)

SPPA 697 Research (4)

SPPA 698 Thesis (6)

SPPA 699 Directed Study (1-3)
Independent study on a research project selected in consultation with the adviser. For advanced students. May be repeated once. The student's transcript will show specific area of study: for example, SPPA 699 DIR STDY — ADLT LANG.


LOMA LINDA UNIVERSITY

III

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THE TRUSTEES

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	1st Vice Chairman	THOMAS J. MOSTERT, JR.
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	Secretary	RICHARD A. JAMES

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Vice President	Academic Administration	HELEN W. THOMPSON, PH.D.
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Vice President	Provost, La Sierra campus	R. DALE MCCUNE, ED.D.
Vice President	Student Affairs	DAVID D. OSBORNE, M.DIV.

THE GRADUATE SCHOOL

The dean, the chief administrative officer of the Graduate School, presides over the Graduate School faculty and the Graduate Council. The Graduate Council gives continuing study to the effectiveness of graduate programs in the departments and divisions; ways to strengthen the offerings and curriculums; maintaining standards; evaluating and initiating, when advisable, appropriate action on such items or proposals as occur to them or as may be referred to them; and bringing to the dean items that involve organization and expansion or addition to the faculty, with recommendation for action. Proposals that affect budgets or overall University policy are subject to review by the Administrative Committee.

W. BARTON RIPPON, PH.D., Dean

GRADUATE SCHOOL COUNCIL

Niels-Erik Andreasen
Thor C. Bakland
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Joseph G. Galusha
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Vernon Howe
Arno Kutzner
Paul J. Landa
John Leonora
Jackie Lindbeck
Lawrence D. Longo
Jean B. Lowry
Paul J. McMillan
Mary E. Moline
P. Ben Nava
Marvin A. Peters
W. Barton Rippon
Delmer G. Ross
Vernon L. Scheffel
R. Bruce Wilcox
Kathleen K. Zolber

THE FACULTY AND ASSOCIATE FACULTY

Faculty and associate faculty are listed below. Code letters are shown after each name indicating program(s) of appointment.

ANAT	Anatomy
BCHM	Biochemistry
BIOL	Biology
DENT	Dentistry
ENGL	English
FMED	Family Life Education
HIST	History
MFAM	Marriage and Family Therapy
MICR	Microbiology
MSTP	Medical Scientist Training Program
NRSG	Nursing
NUTR	Nutrition
PETH	Physical Education and Health
PHRM	Pharmacology
PHSL	Physiology
PLNT	Paleontology
RLGN	Religion
SPPA	Speech-Language Pathology

Adey, W. Ross	PHSL
Alexander, Wilber	RLGN
Aloia, Roland C.	BCHM
Anderson, David	DENT
Andreasen, Niels-Erik	RLGN
Andress, Vern	MFAM
Anholm, J. Milford	DENT
Arendt, Kenneth A.	PHSL
Bakland, Leif K.	DENT
Bakland, Thor C.	DENT
Baldwin, Dalton D.	HIST, RLGN
Barnard, Logan W.	DENT
Bawin, Suzanne M.	PHSL
Baylink, David J.	BCHM
Beltz, Richard E.	BCHM
Blankenship, James W.	BCHM, NUTR
Blaseio, Gunther	DENT
Blazen, Ivan	RLGN
Boucek, Robert J.	MSTP, PHSL
Boyne, Philip J.	DENT
Bradley, Gary L.	BIOL
Brand, Leonard R.	BIOL, PLNT
Brandon, Antonius D.	FMED, MFAM
Brandstater, Murray E.	PHSL
Brauer, Floyd S.	DENT
Bricker, Neal S.	PHSL
Buchheim, H. Paul	BIOL, PLNT
Bullas, Leonard R.	BIOL, MICR
Burke, Kenneth I.	NUTR
Byrd, Bernard C.	DENT
Carrigg, Karen L.	NRSG
Carter, Norman S.	DENT
Caruso, Joseph M.	DENT
Chamberlain, A. Durwin H.	DENT
Chand, Ian P.	FMED, MFAM
Chilson, Robert A.	BIOL
Coffin, Harold G.	BIOL
Comm, Dorothy M.	ENGL
Connell, Bertrum C.	NUTR
Cowles, David L.	BIOL
Crane, Earl R.	DENT
Cress, C. Raymond	PHRM
Crigger, Max	DENT
Cummings, Raleigh R.	DENT
Cutler, Ralph E.	PHRM

Davis, M. Jerry	MFAM, RLGN
Davis, W. Howard	DENT
Day, Lawrence D.	DENT
De Vincenzo, John P.	DENT
Ducsay, Charles A.	PHSL
Dunn, Robert P.	ENGL
Eby, William C.	MICR
Eddleman, C. Douglas	ANAT
Egelberg, Jan H.	DENT
Ehrler, Clelan G.	DENT
Elick, John W.	FMED
Engen, Paul C.	ANAT
Farley, John R.	BCHM
Fletcher, William H.	PHSL
Foster, Patricia C.	NRSG
Fraser, Ian M.	PHRM
Galusha, Joseph G.	BIOL
Gamboa, George C.	DENT
Gantes, Bernard G.	DENT
Garrett, J. Steven	DENT
Gatov, Nelson R.	DENT
Gauntt, Lloyd E.	DENT
Gilbert, Raymond D.	PHSL
Gillespie, V. Bailey	RLGN
Gonzalez, Ramon R.	PHSL
Goulbourne, Eric A.	MICR
Graybill, Ronald D.	HIST, RLGN
Gridley, Daila S.	MICR
Guy, Fritz	RLGN
Haddad, Anees A.	FMED, MFAM
Hagelgantz, Opal I.	ENGL
Hall, Raymond G.	PHSL
Hamerslough, Walter S.	PETH
Harrison, Kenneth H.	DENT
Heinrich, Virgil V.	DENT
Hendryx, Patricia M.	SPPA
Henken, Herbert W.	ANAT
Herrmann, E. Clifford	BCHM
Hessinger, David A.	BCHM, BIOL, PHRM, PHSL
Hoff, Randall E.	DENT
Holmes, Ivan G.	PLNT
Homer, Robert J.	DENT
Hooker, William M.	ANAT
Hoyt, Frederick G.	HIST
Hubbard, Richard W.	BCHM, NUTR
Hunt, Guy M.	ANAT
Huston, Ronald G.	FMED, MFAM
Javor, George T.	BCHM, MICR
Jeiroudi, Toufic M.	DENT
Jo, David J.	DENT
Johnston, Patricia K.	NUTR
Jones, Patricia S.	NRSG
Kaminishi, Ronald M.	DENT
Kelln, Elmer	DENT
Kettering, James D.	MICR
Khoo, Keiko I.	SPPA
Kiger, Robert D.	DENT
King, Helen E.	NRSG
Klooster, Judson	DENT
Knittel, Frank	ENGL
Landa, Paul J.	HIST, RLGN
Larson, David R.	RLGN
Lathrop, Earl W.	BIOL
Lau, Benjamin H. S.	BIOL, MICR
Lau, Kin-Hing W.	BCHM
Laue, Judy M.	ENGL
Leonora, John	PHSL
Lessard, George M.	BCHM
Lewis, John E.	MICR
Lewis, Richard B.	ENGL
Lier, Anthony B.	DENT
Linkhart, Thomas A.	BCHM
Little, Helen F.	ENGL
Longo, Lawrence D.	PHSL
Lowry, Jean B.	SPPA
Maeda, George	PHSL
Maki, Jean E.	SPPA
Matthews, Kenneth E.	ENGL
Maxwell, A. Graham	RLGN
Mazat, Alberta	MFAM
McCluskey, Elwood S.	BIOL, PHSL
McEwen, Lawrence E.	DENT
McMillan, Paul J.	ANAT
Miller, Frances P.	NRSG
Mitchell, Daniel A., Jr.	ANAT
Mitchell, Norman L.	BIOL
Mitchell, Robert D.	DENT
Mohan, Subburaman	BCHM, PHSL
Molinaro, Guiseppe A.	MICR
Moline, Mary	FMED, MFAM
Morgan, Arthur J.	DENT
Morikone, Gary	DENT
Morrow, Steven G.	DENT
Mortensen, Raymond A.	BCHM
Naden, Michelle	MFAM
Napier, William J.	PETH
Nava, P. Benigno	ANAT
Nehlsen-Cannarella, Sandra L.	MICR, PHSL
Nieman, David C.	NUTR
Nilveus, Rolf	DENT
Nishimura, Karl	DENT
Olsen, Lee E.	DENT
Olsen, V. Norskov	HIST, RLGN
Parker, Ronald C.	DENT
Patrickson, John W.	ANAT, PHSL
Pearson, John K.	DENT
Peters, Donald L.	DENT
Peters, Marvin A.	BIOL, PHRM
Peterson, Donald I.	PHRM
Peterson, John E.	DENT
Power, Gordon G.	PHSL
Provonsha, Jack W.	RLGN
Rafuse, Donald R.	PHSL
Ratcliff, Ann E.	SPPA
Rathbun, W. Eugene	DENT
Register, U. D.	BCHM, NUTR

Rice, T. Richard	HIST, RLGN
Rick, Gordon M.	DENT
Ricketts, Robert M.	DENT
Rippon, W. Barton	BCHM, MSTP
Roberts, Walter H. B.	ANAT
Robertson, Thomas L.	DENT
Roos, Philip J.	PHSL
Rosario, John H.	ANAT
Ross, Delmer G.	HIST
Rossi, John J.	BCHM
Roth, Ariel A.	BIOL, PLNT
Roy, Ira	MICR
Rynearson, R. David	DENT
Ryu, Jun-ichi	MICR
Sanchez, Albert	NUTR
Sandberg, Lawrence B.	BCHM
Scheffel, Vernon L.	PETH
Schlenker, Willis L.	DENT
Schmidt, Merrill E.	DENT
Schneider, Robert K.	PETH
Schultz, Robert L.	ANAT
Schwab, Ernest R.	BIOL
Scott, Garland E.	DENT
Seheult, Russell O.	DENT
Seifert, Laurence A.	DENT
Shryock, Harold	ANAT
Shultz, Terry D.	BCHM, NUTR
Simms, Richard A.	DENT
Simon, James H.	DENT
Slattery, Charles W.	BCHM
Stauffer, J. Paul	ENGL
Stringer, Dale E.	DENT
Strong, Donna D.	BCHM
Strother, Allen	PHRM
Strutz, Peter G.	MFAM
Sugiyama, Raymond M.	DENT
Taylor, Barry L.	BCHM, MICR
Taylor, Guy D.	DENT
Taylor, Wm. Holmes	ANAT
Teel, Charles W., Jr.	RLGN, SOCI
Teel, Robert W.	PHSL
Teele, Marilyn C.	ENGL
Thomas, Nelson E.	PETH
Tieche, Jean-Marc	PHSL
Tilton, Bernard E.	PHRM
Tkachuck, Richard D.	BIOL, PLNT
Tomlinson, John L.	DENT
Torabinejad, Mahmoud	DENT
Van Cleve, Lois	NRSG
Vasquez, Beatriz J.	PHRM
Venden, Louis	RLGN
Vine, Kenneth L.	RLGN
Wagner, William	ANAT
Wallace, Bruce	BCHM
Walters, James W.	RLGN
Walters, Roland D.	DENT
Weber, Ruth S.	NRSG
Webster, Clyde L.	BIOL, PLNT
Wergedal, Jon E.	BCHM
Wikesjo, Ulf	DENT
Wilcox, R. Bruce	BCHM
Will, Lawrence W.	DENT
Winslow, Gerald	RLGN
Wise, James R.	DENT
Woodward, Clarice W.	NRSG
Yellon, Steven M.	PHSL
Yoon, Won K.	FMED
Young, James	DENT
Zackrison, Edwin	RLGN
Zimmerman, Grenith J.	NRSG
Zolber, Kathleen K.	NUTR
Zuccarelli, Anthony J.	BCHM, BIOL, MICR

ALUMNI FEDERATION

The Alumni Federation was organized in 1958. This organization provides an avenue by which the several alumni associations, distinctive of emphasis represented by curriculums of the University, join their common concern for the continued welfare of the institution. In turn, through the Federation the University demonstrates its interest in the continued general and professional development of the alumni, whom it regards as the ultimate and true expression of its accomplishments.

By united and reciprocal interaction, the Federation and the University seek to ensure a growing community of scholars, practitioners, and citizens dedicated to excellence. Vitally concerned with excellence in education, the Federation lends itself to enlarging the sphere of influence for good envisioned by the founders of the University.

The Federation seeks to foster unity and loyalty and to promote the growth of the total institution and at the same time the best interests of each part. The Federation endeavors—

1. To foster the natural bond among alumni of each individual school, maintaining the right of alumni to direct their own group activities.

2. To assist the University and its schools in their duty to provide for the continuing general welfare of all students, faculty, and alumni.

3. To encourage alumni through constituent associations to assist in providing adequate and dependable financial support both for the University and for alumni activities.

ACCREDITATION

The University

THE UNIVERSITY: Founded as College of Evangelists 1905-06. Chartered as College of Medical Evangelists by the state of California December 13, 1909. Accredited by Northwest Association of Secondary and Higher Schools April 7, 1937. Accredited by Western Association of Schools and Colleges (prior to January 1962, Western College Association) February 24, 1960. Became Loma Linda University July 1, 1961. Professional curriculums started and approved as indicated.

ARTS AND SCIENCES: Founded in 1922 as La Sierra Academy, a secondary school; in 1927 became Southern California Junior College; in 1946 was accredited as the four-year La Sierra College; in 1967 became College of Arts and Sciences of the University.

THE GRADUATE SCHOOL: Started in 1954. Accredited through University accreditation.

SCHOOL OF BUSINESS AND MANAGEMENT: Started in 1986. Accredited through University accreditation.

SCHOOL OF RELIGION: Started in 1987. Accredited through University accreditation.

The Professions

CYTOTECHNOLOGY: Started in 1982. Initial approval by the Committee on Allied Health Education and Accreditation in collaboration with the Cytotechnology Programs Review Committee January 20, 1983.

DENTAL HYGIENE: Started in 1959. Approved by the Council on Dental Education of the American Dental Association since September 7, 1961.

DENTISTRY: Started in 1953. Approved by the Council on Dental Education of the American Dental Association since May 23, 1957.

DIETETIC TECHNOLOGY: Started in 1988. Approved by The American Dietetic Association since April 25, 1988.

EDUCATION: School of Education organized in 1968 and approved by the California State Board of Education June 12, 1969; approval of programs is maintained with the California State Commission on Teacher Credentialing.

HEALTH INFORMATION ADMINISTRATION: Started as medical record administration in 1963. Approved by the Council on Medical Education of the American Medical Association since December 1, 1963. Currently approved by the Committee on Allied Health Education and Accreditation in collaboration with the American Medical Record Association.

MEDICAL RADIOGRAPHY: Started in 1941 as radiological technology. Approved by the Council on Medical Education of the American Medical Association November 19, 1944. Currently approved by the Committee on Allied Health Education and Accreditation in collaboration with the Joint Review Committee on Education in Radiologic Technology.

MEDICAL SONOGRAPHY: Started in 1976 as diagnostic medical sonography. Approved by the Committee on Allied Health Education and Accreditation in collaboration with the Joint Review Committee on Education in Diagnostic Medical Sonography October 24, 1985.

MEDICAL TECHNOLOGY: Started in 1937. Approved by the Council on Medical Education of the American Medical Association since August 28, 1937. Currently approved by the Committee on Allied Health Education and Accreditation in collaboration with the National Accrediting Agency for Clinical Laboratory Sciences.

MEDICINE: Started in 1909. Approved by the Association of American Medical Colleges and the Council on Medical Education of the American Medical Association since November 16, 1922.

NUCLEAR MEDICINE: Started in 1970. Approved by the Council on Medical Education of the American Medical Association June 23, 1973. Currently approved by the Committee on Allied Health Education and Accreditation in collaboration with the Joint Review Committee on Educational Programs in Nuclear Medicine Technology.

NURSING: Hospital school started at Loma Linda in 1905. Hospital school added at Los Angeles in 1924. Degree school organized in 1948. Accredited by the National Nursing Accrediting Service December 10, 1951, with approval continuing under the National League for Nursing. Initial 1917 approval of the California State Board of Health extended until college program approved July 1, 1952, by the California Board of Registered Nursing. California Board of Registered Nursing approval since 1952. Public Health Nursing preparation recognized 1959.

NUTRITION AND DIETETICS: Started in 1922 as a certificate program; baccalaureate degree conferred 1932-54; graduate program offered since 1954. Internship program continuously approved by The American Dietetic Association from 1957 through 1974; reestablishment of baccalaureate program authorized October 1971. Coordinated undergraduate program accredited by The American Dietetic Association since 1974.

OCCUPATIONAL THERAPY: Started in 1959. Initial approval by the Council on Medical Education of the American Medical Association June 10, 1960. Full approval March 30, 1962. Currently approved by the Committee on Allied Health Education and Accreditation in collaboration with The American Occupational Therapy Association.

PHYSICAL THERAPY: Started in 1941. Initial approval by the Council on Medical Education of the American Medical Association June 6, 1942. Currently approved by the American Physical Therapy Association.

PUBLIC HEALTH: Started in 1948; reorganized in 1964. Approved by the American Public Health Association June 23, 1967. Accredited by the Council on Education for Public Health, 1974.

PUBLIC HEALTH SCIENCE: Started in 1974. Approved through University accreditation.

RADIATION THERAPY: Started in 1970. Approved by the Council on Medical Education of the American Medical Association December 1, 1974. Currently approved by the Committee on Allied Health Education and Accreditation in collaboration with the Joint Review Committee on Education in Radiologic Technology.

RESPIRATORY THERAPY: Started in 1971. Initial approval by the Council on Medical Education of the American Medical Association September 1972. Full approval June 1973. Currently approved by the Committee on Allied Health Education and Accreditation in collaboration with the Joint Review Committee for Respiratory Therapy Education.

SOCIAL WORK: Started in 1972. Accredited by the Council on Social Work Education May 1980.

INSTRUCTIONAL RESOURCES

LIBRARIES

The University has two main libraries (one on the Loma Linda campus and one on the La Sierra campus). The joint holdings are as follows:

Books, bound periodicals, audiovisual materials	723,798
Current periodical subscriptions	4,183

Bus service is provided on schedule each weekday between the two campus libraries so that students and faculty can have access to both libraries. Immediate information can be obtained and lending arrangements made by telephone or mail.

Materials unavailable in either campus library or in the immediate community are obtainable through interlibrary loan. An electronic mail system is used for interlibrary communication. Computerized search services are available to offer computer-printed bibliographies through Medline and other databases in which the libraries participate.

LA SIERRA CAMPUS

Books, bound periodicals, audiovisual materials	398,369
Current periodical subscriptions	1,465

The La Sierra campus library is a general liberal arts collection, with concentrations in history, religion, English, and education. A collection of nineteenth-century Seventh-day Adventist books and pamphlets is in the Heritage Collection. In addition to the microfiche Library of American Civilization already purchased (21,000 titles), the library is augmenting microform holdings.

LOMA LINDA CAMPUS

Books, bound periodicals, audiovisual materials	325,429
Current periodical subscriptions	2,718

The acquisitions of the Del E. Webb Memorial Library on the Loma Linda campus are in medicine, dentistry, allied health professions, and graduate programs; and included in the acquisitions is a liberal arts undergraduate collection in support of certain graduate and professional programs. About half of the resources are in medical and related fields. Some rare materials in the history of medicine are included in the holdings.

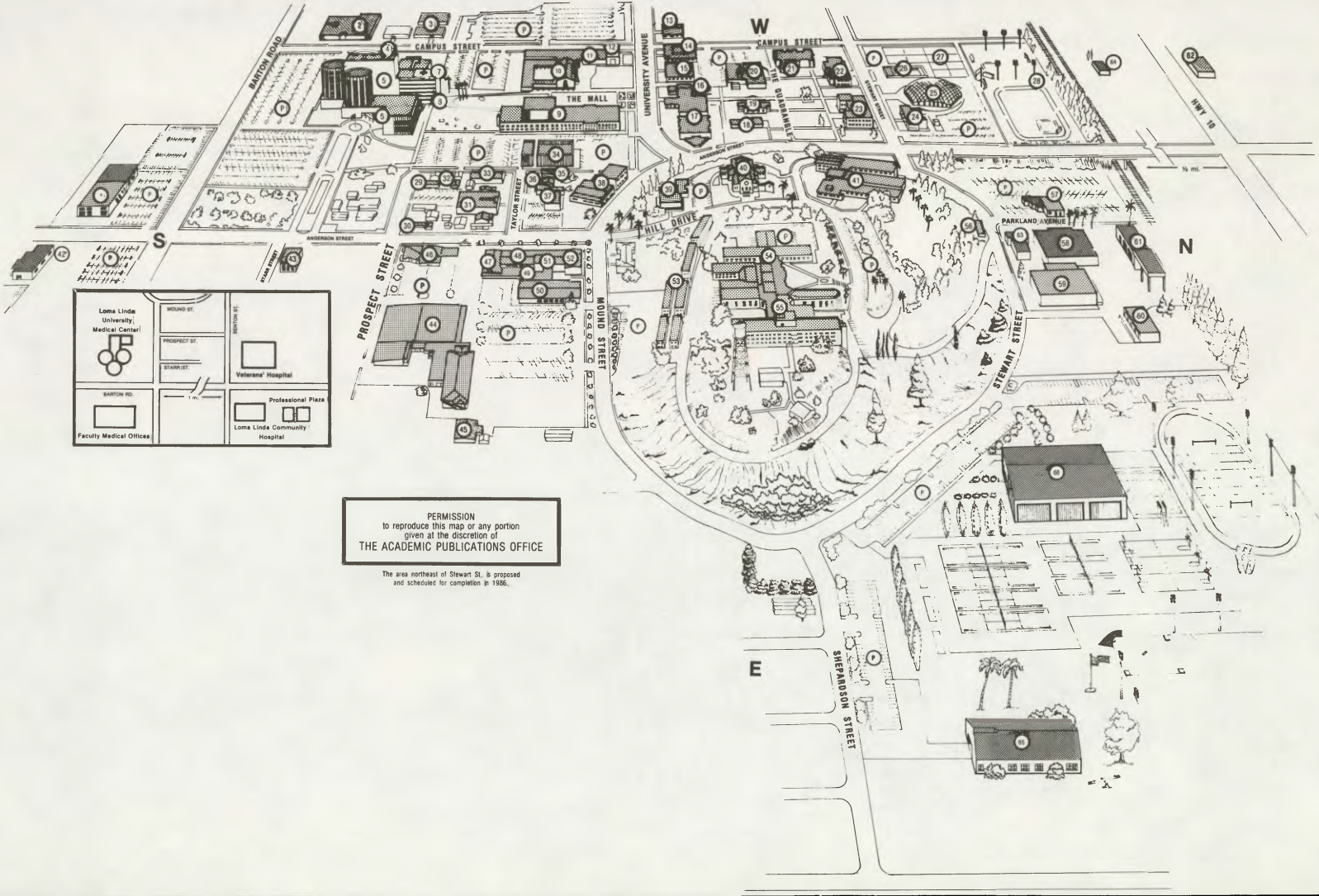
Since 1957 this library has been the official west coast depository for Seventh-day Adventist literature regularly provided by church publishing houses in North America. The publications are in the Heritage Collection established in 1971. Here also are the Ellen G. White source materials, University archives, and an in-process collection of published and unpublished works pertaining to the early Adventist movement.

The Human Relations Area Files on microfiche make available primary source materials on most of the known cultures of the world.

Consortium The following colleges and universities have formed a consortium under the name Inland Empire Academic Library Cooperative to give full borrowing privileges to students and faculty members of the following institutions:

Azusa Pacific University, Azusa
California Baptist College, Riverside
California State University, San Bernardino
California State Polytechnic University, Pomona
University of La Verne, La Verne
Loma Linda University, Loma Linda and La Sierra campuses
University of California, Riverside
University of Redlands, Redlands
Community colleges in the area

Community Within driving distance of the University campuses are other collections accessible to faculty and students: the University of California (Los Angeles and Irvine campuses), the University of Southern California, the Los Angeles public library, the inland area public libraries, and the unique holdings of the Henry E. Huntington Library and Art Gallery.



The area northeast of Stewart St. is proposed and scheduled for completion in 1986.

LOMA LINDA CAMPUS MAP

NUMERICAL LEGEND

1 Loma Linda University Faculty Medical Offices
2 West Hall: MC Accounting / MC Assistant VP for Finance / MC Budget and Reimbursement / MC Clinical Engineering / MC Cost Reporting / Counseling Center / MC Internal Audit / Psychiatry / School of Nursing
3 Nelson Apartments: Cytology Laboratory / Histology Laboratory
4 Hospital Dentistry / Medical Center offices
5 Medical Center / School of Medicine / Health Service (student, employee) / Medical Affairs VP
6 Medical Center (main entrance)
7 Heliport
8 Medical Center (student entrance)
9 Prince Hall: School of Dentistry / Jorgensen Memorial Library
10 University Church
11 Child Care Center / Fellowship Hall
12 Campus Chapel, University Church
13 Orthotic and Prosthetic Service
14 Mortensen Hall (biochemistry)
15 Griggs Hall: Biology / Division of Religion / General Conference representative / Graduate School / Marriage and Family Therapy
16 Magan Hall: The President / Academic Administration VP / Development and Public Relations VP / Financial Administration VP /Corporate Relations / Faculty Records / Gift Records / Geoscience Research Institute
17 University Library
18 Microbiology Annex
19 Burden Hall: Academic Publications / Alumni Federation / Auditorium / News offices / Nursing Alumni Association / University Relations / University Protype
20 Risley Hall (physiology, pharmacology)
21 Basic Science Building (pathology, microbiology)
22 Shryock Hall (anatomy, museum)
23 Evans Hall (School of Medicine, departmental offices)
24 Audiovisual Service
25 Gentry Gymnasium
26 Swimming pool
27 Tennis courts
28 Recreation field
29 Hospital Collection
30 Loma Linda Center for Health Promotion
31 University Arts Building: Foundation Real Estate / Medical Center Assistant VP / Medical Center Personnel / Medical Center Purchasing / Private practice office / University Personnel / University Quick Print
32 Medical Center Forms Management
33 Dentistry faculty practice
34 Power Plant
35 Dentistry research
36 Graphics Studio, School of Dentistry
37 Medical Center Information Systems
38 Business / City Hall / Internal Audit, University / Justice Court
39 Linda Hall / Welfare Center, Campus Hill Church
40 Campus Hill Church
41 Lindsay Hall (women's residence)
42 Dialysis Center
43 Alumni Center: Nursing Staff Development / School of Dentistry Alumni / School of Medicine Alumni / Trust Development / Walter Macpherson Society / Women's Auxiliary
44 Convenience Center: Bakery / Bookstore / Camera Shop / Campus Store / General Conference Auditors / Hardware / Market / Patio Pantry / Pharmacy, University / Florist / Risk Management
45 University Mail and Addressograph
46 Security Pacific National Bank
47 U.S. Post Office
48 Dean of Students / Student Aid / Student Finance / University Admissions and Records / University Computing
49 Foundation Affairs / Grants Management / University Accounting / Campus Controller / University Payroll
50 Campus Cafeteria
51 Campus Business Administration / Physical Plant Administration
52 La Loma Credit Union
53 Daniells residence complex
54 Nichol Hall: School of Health / Preventive Medicine Clinic
55 Nichol Hall: School of Allied Health
56 Campus Security
57 Construction / Housekeeping / Radiation Safety
58 Campus Maintenance / Machine Shop / Radiation Engineering Shop
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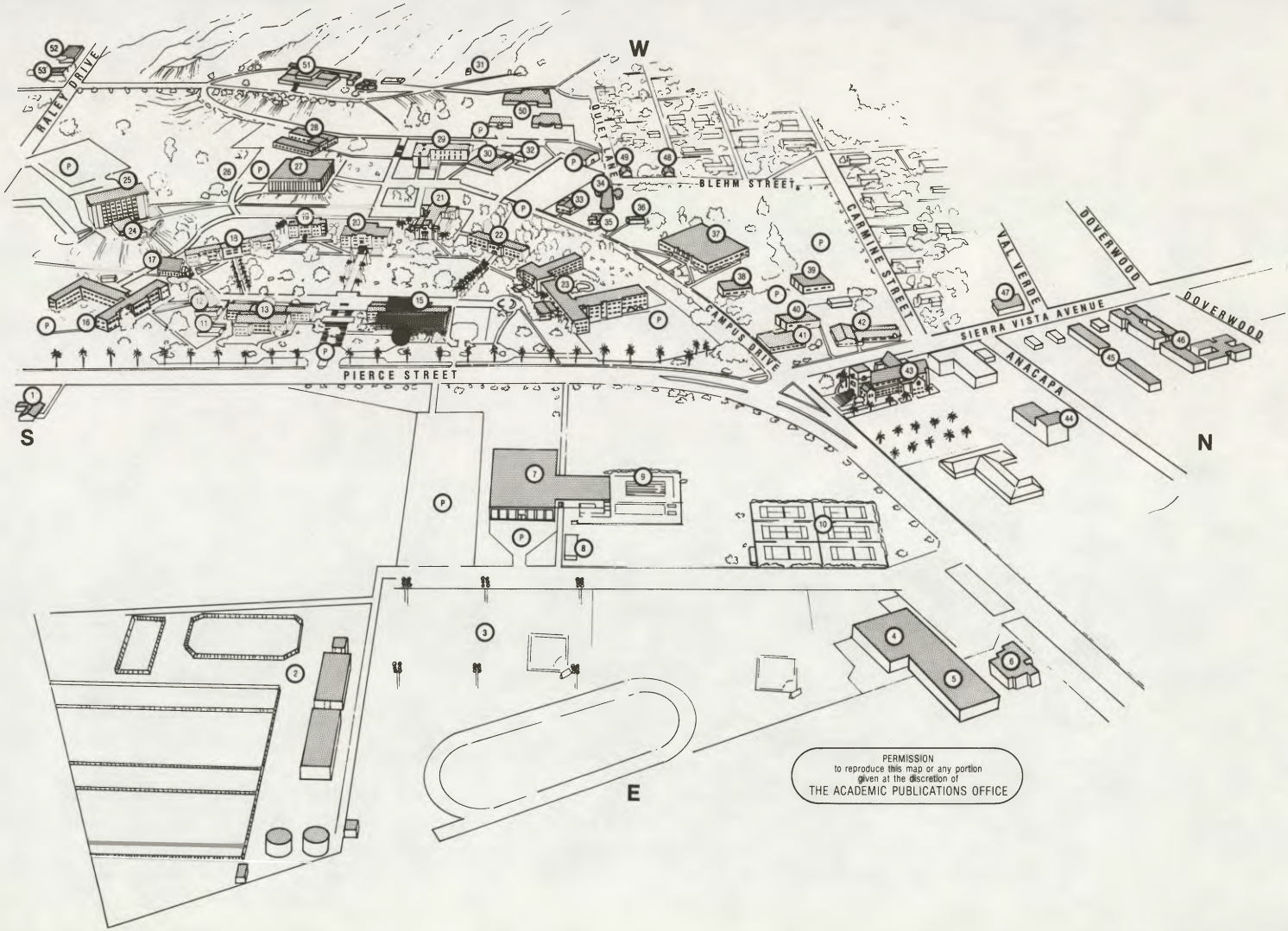
The area northeast of Stewart St. is proposed and scheduled for completion in 1986.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LA SIERRA CAMPUS MAP

NUMERICAL LEGEND

1 Agriculture
2 Dopp Equestrian Center
3 Recreation fields
4 College Market / Bookstore
5 Convenience Center
6 Soup Stone Restaurant
7 Alumni Pavilion / Gymnasium
8 Physical Education office
9 Swimming pool
10 Tennis courts
11 Safety and Security
12 Administrative Annex
13 Administration Building (academic, financial): The President / Provost / Vice Presidents for Academic Administration, Development and Public Relations, Financial Administration / Accounting Service / Alumni Affairs / Dean of Students / Departments of Business and Economics, Secretarial and Business Education / Graduate School Dean / Offices of Admissions and Records, Business, News and Public Information, Payroll, Personnel, Purchasing / Student Admissions, Affairs, Aid, Employment, Finance, Loans, Recruitment
14 Student Center
15 The Commons / Food Service (cafeteria)
16 Calkins Hall: men
17 Matheson Chapel
18 South Hall: women
19 San Fernando Hall: Physics
20 La Sierra Hall: Counseling Center / Division of Religion / English / History and Political Science / Mathematics / Modern Languages / School of Education
21 Hole Memorial Auditorium: Auditorium / Education / Music / Testing
22 Gladwyn Hall: women
23 Angwin Hall: women
24 Meier Chapel
25 Sierra Towers: men
26 John Clough Park
27 University Library: Learning Advancement Program / Media Services
28 Ambs Hall: Industrial Studies
29 Consumer Related Sciences / Child Development Learning Center
30 Communication / KSGN / Nursing
31 Art
32 Nursing
33 Mail Service / Custodial Service
34 Cossentine Hall/World Museum of Natural History
35 Health Service
37 Palmer Hall: Animal quarters / Biology / Chemistry
38 Biology Annex
39 Geological Sciences Annex
40 Behavioral Sciences Annex
41 Behavioral Sciences: Anthropology / Psychology / Social Work / Sociology
42 Sierra Vista Chapel / Welfare Center
43 La Sierra Collegiate Church
44 Geological Sciences Research Center
45 Walnut Grove Apartments
46 Sierra Vista Apartments
47 Sierra Vista House
48 Child Development Preschool
49 Geological Sciences
50 Visual Art Center
51 Physical Plant Services (maintenance)/ Receiving
52 Rhoads House
53 Raley House

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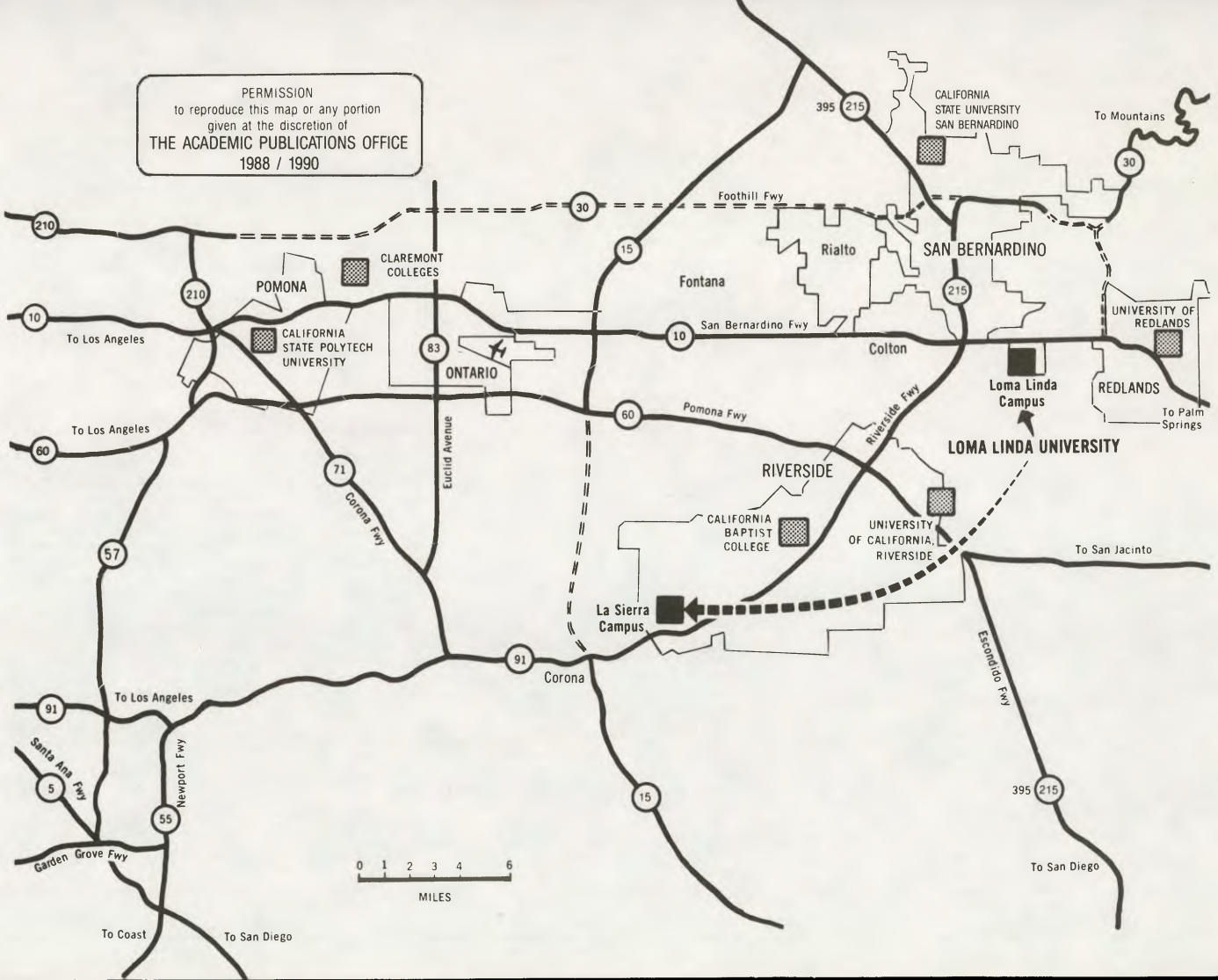
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UNIVERSITY INFORMATION

BOTH CAMPUSES

General University interests	The President's Office
Student welfare, housing, visas	Student Affairs Office
Student finance	Student Aid and Finance Office
Records	Office of University Records
Area Code	#714

LA SIERRA CAMPUS

MAIL: Riverside California 92515	TELEPHONE: 1/800/422-4LLU (information only) **or** 1/800/548-7114 (Canada)
Campus Operator	785-2022
College of Arts and Sciences	Dean 785-2210
School of Business and Management	Dean 785-2060
School of Education	Dean 785-2266
School of Religion	Dean 785-2041

LOMA LINDA CAMPUS

MAIL: Loma Linda California 92350	TELEPHONE: 1/800/422-4LLU (information only) **or** 1/800/548-7114 (Canada)
Campus Operator	824-4300
School of Dentistry	796-0141 Redlands 824-0030 Riverside, San Bernardino
All other Schools	796-3741 Redlands 824-4300 Riverside, San Bernardino
School of Allied Health Professions	Dean 824-4599
CLINICAL LABORATORY SCIENCE	824-4966
HEALTH INFORMATION ADMINISTRATION	824-4976
NUTRITION AND DIETETICS	824-4593
OCCUPATIONAL THERAPY	824-4628
PHYSICAL THERAPY	824-4632
RADIOLOGIC TECHNOLOGY	824-4931
RESPIRATORY THERAPY	824-4932
SPEECH PATHOLOGY	824-4599
School of Dentistry	Dean 824-4683
DENTISTRY	
DENTAL HYGIENE	
School of Public Health	Dean 824-4578
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