Loma Linda University

TheScholarsRepository@LLU: Digital Archive of Research, Scholarship & Creative Works

Graduate School Bulletins

Catalogs and Bulletins

3-1974

1974 - 1976 Bulletin

Loma Linda University

Follow this and additional works at: https://scholarsrepository.llu.edu/gs_bulletin

Recommended Citation

Loma Linda University, "1974 - 1976 Bulletin" (1974). *Graduate School Bulletins.*
https://scholarsrepository.llu.edu/gs_bulletin/5

This Book is brought to you for free and open access by the Catalogs and Bulletins at TheScholarsRepository@LLU: Digital Archive of Research, Scholarship & Creative Works. It has been accepted for inclusion in Graduate School Bulletins by an authorized administrator of TheScholarsRepository@LLU: Digital Archive of Research, Scholarship & Creative Works. For more information, please contact scholarsrepository@llu.edu.

graduate school

LOMA LINDA UNIVERSITY

1974-76

Bulletin of LOMA LINDA UNIVERSITY Graduate School 1974-76

The information in this BULLETIN is made as accurate as is possible at the time of publication. The student is responsible for informing himself and satisfactorily meeting all requirements pertinent to his 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 65, Number 1, March 1974

Published twice a month
March, April, May, June;
once in July.
Entered June 7, 1923, as second-class
matter, Loma Linda, California 92354

graduate school

This is a *two-year* BULLETIN.
Retain for use during 1974-75 and 1975-76

LOMA LINDA UNIVERSITY

1974-76

CONTENTS

LOMA LINDA UNIVERSITY is a Seventh-day Adventist coeducational institution in inland southern California, sixty miles east of Los Angeles (in the San Bernardino, Redlands, Riverside area).

Having sprung from medical origins in 1905, the University has a strong emphasis that results from development of education in the health arts and sciences during more than sixty years. Professional curriculums are offered by the Schools of Allied Health Professions, Dentistry, Health, Medicine, and Nursing on the Loma Linda campus. The College of Arts and Sciences and the School of Education are located on the La Sierra campus at the west edge of Riverside. The resources of this division (accredited as a senior college since 1946 and united with the University in 1967) contribute curriculums in applied and liberal arts and sciences and programs in professional education in fulfillment of requirements for teaching credentials. Graduate programs of the departments of the schools are offered from both campuses through the Graduate School.

The core of the combined faculties consists of approximately 550 full-time teachers. Part-time and voluntary teachers, especially clinicians in the professional curriculums, bring the total past 1,200. Many nations of the world are represented in the annual enrollment of 3,600 students.

Curriculums are offered for the Associate in Science, Associate in Arts, Bachelor of Music, Bachelor of Science, Bachelor of Arts, Master of Science in Public Health, Doctor of Dental Surgery, Doctor of Medicine, Master of Public Health, Doctor of Health Science, Master of Science, Master of Arts, and Doctor of Philosophy degrees.

The University is accredited by the Western Association of Schools and Colleges and is a member of the American Council on Education, the Association of American Colleges, and the Association of Seventh-day Adventist Colleges and Secondary Schools. The professional curriculums are approved by the respective professional organizations.

1974 - 75 CALENDAR 1975 - 76

1974 - 75		1975 - 76
February		**February**
JAN 29- 1	Mission Emphasis Week LL	—
9	Faculty-student banquet	8
4- 8	Mission Emphasis Weekend LS	—
March		**March**
17-20	Final examinations	15-18
20	Winter quarter ends	18
21	*Spring recess*	19
25	Last day to petition for master's candidacy for June	23
	SPRING QUARTER	
—	Preregistration as arranged	—
31	Registration	30
April		**April**
1	Instruction begins	
14	Last day to submit a preliminary copy of thesis or dissertation to guidance committee Last day to enter a course	12
7-12	Spring Week of Devotion	—
May		**May**
7	Last day for master's comprehensive examinations	5
7	Last day to submit thesis or dissertation to guidance committee in proposed final form, with blank signature sheets	5
14	Last day for final oral examinations	12
28	Last day to file final copy of thesis or dissertation and signed approval sheets with GS dean	26
26	Memorial Day recess	31
June		**June**
4	Awards chapel LL	2
9-12	Final examinations	7-10
12	Spring quarter ends	10
13-15	*Commencement Events*	11-13
13	Summer recess begins	11
19	Registration for summer term (11 weeks)	17
23	Registration for summer term (8 weeks)	21

1974 - 75 CALENDAR 1975 - 76

SUMMER SESSION

1974 - 75		1975 - 76
June		**June**
17	Instruction begins: DENT	20
July		**July**
1	Last day to enter a course	1
4	Independence Day recess	4
August		**August**
1	Last day to file in GS office application for admission to fall term (with all supporting information)	1
26-29	Final examinations	25-28
29	Summer quarter ends	28

AUTUMN QUARTER

September		**September**
—	Preregistration as arranged	—
29- 1	Registration	28-30
October		**October**
2	Instruction begins	1
15	Last day to enter a course	14
21-26	Autumn Week of Devotion	—
November		**November**
7	Last day to petition for doctoral candidacy for June	6
8-10	Retreat	14-16
27- 1	Thanksgiving recess	26-30
December		**December**
2	Instruction resumes	1
16-19	Final examinations	15-18
19	Autumn quarter ends	18
20	*Winter recess begins*	19

WINTER QUARTER

January		**January**
—	Preregistration as arranged	—
6	Registration	5
7	Instruction begins	6
20	Last day to enter a course	19

THE CHRISTIAN UNIVERSITY — if it is indeed a university and truly Christian — should be a community composed of members who aim to engage in free inquiry, to find zest and value in interchange of opinions and ideas, and to prize truth . . . who know that law begins with governance of the self . . . who hold respect for a neighbor paramount and promote good for others as attentively as for themselves.

The learner should find the university community an environment conducive to mastery of a chosen discipline, art, or profession, and to the joy of participating in the advancement of knowledge. In the Christian university he should find also circumstances that encourage affirmation of meanings that endure and discovery of perspectives that enhance the view that all truth stems from One Source, so that each branch of knowledge thus seen as part of a whole can be appreciated and respected.

But the learner is not a passive receiver. He himself is a contributor to the environment. His very presence — the unique blend of aptitudes, attributes, and aspirations that impel him — affects its quality. If his will springs from the intention to grow throughout his lifetime, to think autonomously yet work conjointly, to do justly and love mercy, to be whole — his presence enriches the environment.

If the universe speaks to him of the Omniscient God, Initiator of all — knowledge, order, reason, beauty, love, and whatever is of great worth — so that his experience, values, and knowledge are consonant, then the learner can be a witness whose healing, steadying, inspiriting influence may help alleviate the anguish of a bewildered and disenchanted world.

I

Admission Information
Financial Information
Programs and Degrees
Academic Practices

THE GRADUATE SCHOOL of Loma Linda University operates on the assumption that the goal of education is a knowledge of God. The ultimate concern of both faculty and students is the quest for meaning Since that quest is to be served by knowledge, it becomes the obligation of the graduate student not only to achieve both a broad and detailed mastery of this field of study, but also to participate with the members of the faculty in the studies and research by which knowledge is augmented.

Objectives

As it attempts to create an environment favorable to the serious pursuit of knowledge and meaning, the Graduate School fosters these specific purposes:

1. To make available to graduate students the education necessary for scholarly careers in the arts and sciences and in the health professions.

2. To encourage the development of independent judgment and mastery of the techniques of research and the arts of expression.

3. To relate man's intellectual achievement to use in the service of mankind.

Administration

The Dean, the chief administrative officer of the Graduate School, presides over the Graduate School Faculty and the Executive Committee. The Executive Committee 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 items that involve organization and expansion or addition to the Faculty with recommendation for action. Proposals that affect budgetary matters or overall University policy are subject to review by the Administrative Committee.

ADMISSION INFORMATION

The admissions committees of the University put forth considerable effort to be assured that an applicant to any of the schools is qualified for his proposed curriculum and seems likely to profit from educational experience in this University. The Admissions Committee of the Graduate School examines evidence, derived from the usual sources consulted by colleges and universities, of scholastic competence, moral and ethical standards, and significant qualities of character and personality. The ability to do a high quality of graduate work and the intention to use wisely the competence he will develop are the best recommendations an applicant can have. The applicant is considered for admission only on the recommendation of the department in which he wishes to study.

APPLICATION AND ACCEPTANCE

Where to write

Inquiry about admission and application should be addressed to:

Dean, Graduate School
Loma Linda University
Loma Linda, California 92354

Procedure

1. A personal interview is desirable and should be arranged, if it is possible, with the Dean of the Graduate School or with the chairman of the department in which the student wishes to work.

2. Application forms are available from the Graduate School office. Two copies should be filled out and mailed, together with the application fee, to the Dean. Applications and all supporting information — transcripts, test results, references — must be in the office of the Graduate School at least two months before the beginning of the term to which admission is sought.

3. Two complete official transcripts of all work previously taken in colleges, universities, or professional schools and technical schools should be provided to the University. It is the applicant's responsibility to arrange to have the transcripts sent directly by the registrar of each school he has attended to the Dean of the Graduate School.

4. When the department in which the student wishes to study has evaluated the application and made its recommendation, the Graduate Admissions Committee takes official action and the Dean notifies the applicant. The formal notice of admission should be presented at registration time as evidence of eligibility to register in the Graduate School.

5. The accepted student furnishes required certificates of health records to the University Health Service as soon as possible after acceptance.

ADMISSION REQUIREMENTS

Baccalaureate degree

A baccalaureate degree (or its equivalent) from an accredited college or university is prerequisite to admission to the Graduate School. Transcripts of the applicant's scholastic record should show appropriate preparation, in grades and content, for the curriculum in which he plans to enroll. Since there is some variation in the pattern of undergraduate coursework prescribed by different departments, the student should note the departmental descriptions.

Scholarship

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

Foreign language study

It is to an applicant's advantage to have included in his preparation for graduate study sufficient work in at least one foreign language to enable him to read that language with ease.

Examinations

Scores on the aptitude and advanced tests of the Graduate Record Examination are required with applications for admission. Students may address inquiries about these examinations to the Dean of the Graduate School. Application forms for the Graduate Record Examination 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 Graduate Record Examination results, scores for the Miller Analogies Test and the Doppelt Mathematical Reasoning Test may be substituted for the GRE aptitude test.

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, and have a certificate of eligibility sent to the Registrar. Applications should be made well in advance of enrollment. Further information may be requested of the Registrar.

Reentrance

A student who discontinues his studies at the University must meet the entrance requirements in force at the time of his reentrance, unless he has been granted a leave of absence.

FOREIGN STUDENTS

Foreign students who seek admission to the Graduate School should submit applications and all supporting documents at least six months before the beginning of the term in which they hope to enroll. Official records of college work must report the subjects studied, with the examination marks obtained, and must certify the degree or degrees awarded. A foreign student applicant must take the aptitude and advanced tests of the Graduate Record Examination and, if his education has been in a language other than English, the Test of English as a Foreign Language

TOEFL

(TOEFL). These examinations are administered in most foreign countries. Inquiry about the time and place of administration of the tests should be addressed to Educational Testing Service at the addresses noted under 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. An amount equivalent to the tuition charge for two quarters must be on deposit in the Office of Student Aid and Finance before immigration documents are furnished.

ADMISSION CLASSIFICATIONS

Applicants are admitted in one of the following classifications. For regular and provisional status, the applicant must be approved for acceptance by the department in which he proposes to do his major concentration. Special and unclassified status are subject to the availability of facilities.

Regular — A student who meets the scholarship requirements for admission to the graduate program he has chosen and who has no undergraduate deficiencies is classified as a *regular* graduate student.

Provisional — A student (*a*) whose scholarship does not reach the level for regular graduate standing but who shows promise of success in graduate studies, or (*b*) whose undergraduate sequence is inadequate for his chosen graduate program may be classified as a *provisional* student. To continue his eligibility for graduate study, a student admitted on provisional status is expected to earn a grade point average of 3.00 quarter by quarter.

Special — A student who wishes to enroll for certain graduate courses for personal or professional purposes but who does not wish to become a candidate for a graduate degree may be classified as a *special* student. One who wishes to be a special graduate student must apply in the usual way, must place on file a complete record of his previous educational experience, must meet the deadline for consideration of applications, and must be admitted in the same way as a regular student. Dental graduate students in the certificate program are included in this classification.

Unclassified — A student who holds a baccalaureate degree may apply for admission to *unclassified* postgraduate status by submitting a special brief application form to the Dean. If the application is approved by the Dean, the student must secure the consent of the instructor of the class he wishes to enter and a signature indicating that the instructor is satisfied that the student has met course prerequisites. If an unclassified student is later admitted to a degree program, ordinarily no course taken in unclassified status will apply toward degree requirements — an exception being possible only on the recommendation of the adviser or guidance committee.

Auditor — A student in any classification may register for a course as *auditor* with the consent of his adviser and the instructor of the course. He pays tuition and agrees to attend all course lectures.

College senior — A senior who otherwise meets all requirements for graduate standing may be allowed to take graduate courses simultaneously with courses that complete his bachelor's degree requirements if this does not constitute an overload.

FROM MASTER'S TO PH.D. DEGREE

Bypassing master's

A graduate student at this University usually proceeds first to a master's degree. If at the time of application he knows that he wishes to qualify for the Doctor of Philosophy degree, he should declare that intention even though his first objective is a master's degree. If, after admission to a master s program, he decides to proceed toward the doctorate, he should file a written notice of his intention as soon as possible after the decision is made. A student who desires to bypass the master's degree may do so on the recommendation of his guidance committee and with the consent of the Dean, on these grounds: He has completed coursework and research 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

The University does not encourage a student who holds one master's degree to work for a second. A student who wishes to qualify for an additional master's degree in a new field, however, may request permission to do so. The Dean of the Graduate School and the faculty of the department the student wishes to enter will consider such a request on the basis of its individual merits. Work applied toward the first master's degree cannot be applicable to the second. However, in some combined programs (as the M.P.H./M.S., in nutrition, for example) certain required courses may be counted toward both degrees.

FINANCIAL INFORMATION

GENERAL PRACTICES

The student is expected to arrange for financial resources to cover his expenses before the beginning of each school year. Accounts with other schools or with 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, tuition is refundable. If withdrawal occurs after the second week, but before

Refunds

the midpoint of the quarter, a 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 the Director of Student Aid and Finance. An account that is more than thirty days past due is subject to a service charge of one percent per month (twelve percent per year). Failure to pay scheduled charges or to make proper arrangements, which is reported to the Registrar and the Dean, may cause the student to be considered absent, discontinued, or ineligible to take final examinations.

Financial clearance

The student is expected to keep his financial status clear at all times. He must obtain financial clearance before registration each term and 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 Social Security 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 (*a*) transfer records to the Veterans Administration Regional Office, 11000 Wilshire Boulevard, Los Angeles, California 90024; (*b*) have a certificate of eligibility sent to the Registrar at Loma Linda University.

Health service

A student registered for 7 or more units is automatically covered by health service provisions. A student enrolled for fewer than 7 units may request and pay for health service coverage. The charge for health insurance covers the hospital and medical expenses outlined in the insurance information folder. Items not covered by the terms of the health insurance are charged to the student in all cases, and payment is expected at the time these services are given.

SCHEDULE OF CHARGES

GRADUATE SCHOOL PROGRAMS IN GENERAL

Tuition	$ 685	Per quarter, for 12 or more units.
	2055	Per year, for 12 or more units each term.
	58	Per unit, for fewer than 12 units.

GRADUATE DENTISTRY PROGRAMS

Tuition	$4400	Total, two-year programs. Payments each July 1 and February 1.
	5000	Total, three-year programs. Payments each July 1 and February 1.

SPECIAL CHARGES

Special charges	$ 10	Application.
	15	Registration for graduate thesis supervision, per quarter.
	10	Late registration, first day; $1 per additional day.

Change — **Tuition and fees are subject to change without notice.**

STUDENT AID

University fellowships — To the extent that funds are available in departments and schools, fellowships and scholarships may be awarded to graduate students having good records. Holders of fellowships or scholarships are required to perform no routine duties except as these are a part of the program of instruction and training. University fellowships carry stipends of $2,000 per academic year with remission of tuition.

Assistantships — A limited number of teaching and research assistantships, with stipends up to $2,500 per academic year, are provided from operating and grant funds with the understanding that the student will perform such duties as may be required of him by the one to whom he is responsible, not to exceed half time.

Application — An application for fellowship, scholarship, or assistantship from a student not already enrolled in a graduate program at the University must be accompanied by an application for admission.

Closing date — An application involving a request for financial aid of any sort should be in the office of the Dean of the Graduate School not later than March 1. Awards are made for an academic year beginning with the fall quarter.

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 of the Director of Student Aid and Finance.

PROGRAMS and DEGREES

The Graduate School offers programs leading to the degrees of Master of Science, Master of Arts, and Doctor of Philosophy in the fields listed below. The campus on which each program is primarily conducted is indicated by the designation LS (La Sierra) or LL (Loma Linda).

Master of Science

- Anatomy LL
- Biochemistry LL
- Communicative Disorders LS
- Marriage, Family, and Child Counseling LL
- Mathematical Sciences LL:
  - Biomathematics LL
  - Biostatistics LL
- Medical Technology LL
- Microbiology LL
- Nursing LL
- Nutrition LL
- Pharmacology LL
- Physiology LL
- Psychiatry LL
- Dentistry LL:
  - Endodontics
  - Oral Surgery
  - Orthodontics
  - Periodontics

Master of Arts

- Anthropology LL
- Biology LL
- English LS
- History LS
- Middle Eastern Studies LL
- Religion LL
- Sociology LL

Doctor of Philosophy

- Anatomy LL
- Biochemistry LL
- Biology LL
- Mathematical Sciences LL
- Microbiology LL
- Pharmacology LL
- Physiology LL

Graduate programs of other schools

Other graduate degrees are offered by the School of Health (Master of Science in Public Health and Master of Public Health) and the School of Education (Master of Arts).

Programs for secondary teaching

Students undertaking graduate study to prepare for teaching should acquaint themselves with offerings of both the Graduate School and the School of Education. The School of Education programs leading to a Master of Arts degree in secondary education not only include professional education courses but also make provision for advanced coursework in the student's teaching field(s). Students who are working in the Graduate School toward a master's degree in a content field and planning for secondary school teaching are encouraged to qualify for the appropriate teaching credentials. For details, they should consult the credentials adviser in the School of Education.

A student whose vocational objective, for example, is teaching history in secondary school has these choices:

a. A program in secondary education in the School of Education. This program, which may include as much as 16 units of history, requires fulfilling the professional requirements for a teaching certificate. *Or* —

b. A program in history in the Graduate School. If he has not previously qualified for a teaching credential, the student would be encouraged to take, in addition to the courses required for his graduate degree in history, courses in the School of Education necessary for certification.

Those who look forward to college teaching or to the pursuit of a Doctor of Philosophy degree are encouraged to take the master's degree in a content field offered by the Graduate School.

DEGREE REQUIREMENTS

Master of Arts
Master of Science

The following are the general requirements for earning a MASTER OF ARTS or a MASTER OF SCIENCE degree:

1. A minimum grade average of B (3.00) with no subject below C (2.00), 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 average on all work taken at this University.
2. Minimum of 48 quarter units.
3. Residence of at least one academic year. Since 12 units constitute a full graduate study load, more than one year may be needed to complete the requirements for the degree.
4. Reading knowledge of a modern foreign language, or a synthetic language, if specified by the student's department.
5. Credit in a graduate religion course (minimum of 3 quarter units).
6. Written and/or oral examinations, comprehensives and finals, as prescribed by each department.
7. Thesis (unless an alternative plan is available in the student's program).

Doctor of Philosophy

The following are the general requirements for earning a DOCTOR OF PHILOSOPHY degree:

1. A minimum grade average of B (3.00), with no subject below C (2.00) on all work for the degree. This average must be maintained in formal courses and in research, computed separately. A student submitting transfer credits must earn a B average on all work taken at this University.
2. Residence of three academic years, at least two years of which must be on the Loma Linda campus after acceptance for a specific Doctor of Philosophy degree curriculum. On recommendation of the student's guidance committee and department chairman, one of the three years may be accounted for by a master's degree program in the same or a supporting field. In order to obtain full residence credit for any term, the student must devote his full time and energy to graduate work, ordinarily with the equivalent of 12 units per quarter in courses, seminars, or research. It should be emphasized, however, that formally meeting residence requirements and a specified total and pattern of course credits does not automatically meet degree standards. Mature scholarship, productive promise, and active awareness of the history, materials, demands, and resources of his specialized field are assessed as the concluding evidence of a candidate's qualifications for a Doctor of Philosophy degree.
3. Comprehensive examinations as prescribed by the student's department.
4. Reading knowledge of two languages other than English, usually French and German. On the recommendation of the department chairman and with the

approval of the Dean, some other modern foreign language or a synthetic language may be permitted.

5. Credit in a graduate religion course (minimum of 3 quarter units).

6. The presentation of a dissertation related to his principal field of study and giving evidence of the candidate's ability to carry on independent and significant investigation.

7. A final oral examination.

Additional specific requirements

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

BIOMEDICAL SCIENCE PROGRAMS

Combined M.D./PH.D. or D.D.S./PH.D. program

The Biomedical Science Program provides opportunity for especially well qualified and motivated students to make a joint approach to professional and graduate education and to prepare for careers in clinical specialization, teaching, or investigation of problems in health and disease in man.

The student may enter a program cooperatively offered by the School of Medicine and the Graduate School and earn concurrently the Doctor of Medicine and the Doctor of Philosophy degrees. Or similarly he may enter a program cooperatively offered by the School of Dentistry and the Graduate School and earn concurrently the Doctor of Dental Surgery and the Doctor of Philosophy degrees. A minimum of six years of study is required to complete such a program.

Whatever his choice of lifework, the student who pursues the degrees offered in the Biomedical Science Program prepares himself to mesh the knowledge and viewpoints of the clinician and the scientist.

Prerequisites

For admission to the Biomedical Science Program, the student must have a baccalaureate degree, must qualify for admission to both the Graduate School and the professional School (Medicine or Dentistry), and must have the approval of the Biomedical Science Advisory Committee. Application may be made at any point in the student's progress in the professional school, with a year or two into the professional program as an appropriate time. The student's combination classification is regarded as continuous until his program is completed or until discontinuance is recommended by the Biomedical Science Advisory Committee, the Graduate School, or the professional school.

During the pursuit of the student's individualized program, the Biomedical Science Advisory Committee selects his adviser, recommends the membership of his graduate guidance committee, and recommends him for advancement to candidacy.

Majors

Graduate majors are offered in anatomy, biochemistry, biology, mathematical sciences, microbiology, pharmacology, and physiology. Minors are not required but may be recommended in individual cases. A minimum of two years of full-time graduate study is required beyond the professional school curriculum. Elective time in the professional school may be spent in meeting graduate requirements.

Combined M.D./M.S. or D.D.S./M.S. program

Besides the Biomedical Science Doctoral Program described above, a combined program leading to a Master of Science degree is open to qualified students of medicine or dentistry. The student interested in establishing a broader science base for his profession, or looking toward a career in teaching or research may register in the Graduate School at the end of his first year of professional education. He may then fulfill the requirements of the second year of professional education over a two-year period while simultaneously completing sufficient coursework and research to qualify for the Master of Science degree.

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 Registrar and clearing financial arrangements with the Director of Student Aid and Finance. The course list filed with the Registrar 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 his particular degree, never less than one academic year. A year of residence is defined as three quarters of academic work. The master's degree candidate must complete not less than two quarters of full-time study. Although 12 units is ordinarily considered a full graduate study load, a student is considered in full-time residence if he is registered for at least 8 units.

Extramural work

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

Leave of absence

A student who wishes to withdraw for a quarter or longer submits a written request for leave of absence, indicating his reason and the length of time he plans to be out of the program. 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.

Readmission

A student who has interrupted his graduate study without arranging for a leave of absence and who wishes to resume work toward a graduate degree is required to reapply 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 his degree. For quarters during which he is on leave or is completing his thesis, a minimum fee is charged.

Withdrawal

The student wishing to withdraw from a graduate program must notify his major professor in writing, with a copy to the Dean of the Graduate School, giving the reason for withdrawal and the approximate date. He must then arrange for formal withdrawal at the Office of the Registrar.

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 he may not transfer excess grade points to offset less than a B average at the University. A cooperative arrangement between Loma Linda University and the University of Redlands allows for considerable flexibility in the transfer of credits applicable toward the master's degree. Students should consult their departmental advisers for information about courses available at the University of Redlands.

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. Under no circumstances in such instances is the transfer student relieved of residence requirements at this University.

Chapel

Weekly devotional services are held as part of the regular program of the University, and students are expected to attend.

GUIDANCE COMMITTEE

Each student accepted into a degree program has appointed for him an adviser who helps him arrange his program of studies to meet University requirements. Subsequently (no later than when he applies for candidacy) he is put under the supervision of a guidance committee. This committee is responsible to and works with the chairman of the student's department in arranging course programs, screening thesis and dissertation topics (where applicable), guiding the student through his research, arranging for final written and/or oral examinations, evaluating the thesis or dissertation and other evidence of the candidate's fitness to receive his degree, and recommending him for graduation.

CANDIDACY

Petition

Admission to the Graduate School or conferring the status of full graduate standing does not constitute admission of the student to candidacy for a graduate degree. Admission to candidacy is initiated by a written petition from the student to the Dean, on recommendation of his major department chairman.

Master's degree

Petition for candidacy for the master's degree must (*a*) include a statement of the student's complete program of studies, (*b*) present a satisfactory grade record, including at least one quarter of full-time work at the University, (*c*) report the satisfaction of the language requirement, (*d*) include a statement of the proposed thesis or dissertation topic (where applicable) that has been approved by the student's guidance committee, and (*e*) note any other qualification prescribed by the

department. A student must be advanced to candidacy not later than the beginning of the term in which he expects to complete degree requirements.

Doctoral degree

The student's petition for candidacy for the Doctor of Philosophy degree will include, in addition to the items listed above, information that he has passed comprehensive written and oral examinations. Candidates for the doctorate at the June graduation must have been advanced to candidacy not later than the previous November.

EXAMINATIONS

The student takes the written and oral examinations prescribed by his department.

Master's degree

For the master's degree candidate these include a final examination not later than a month before the date of graduation.

Doctoral degree

The doctoral candidate is required to take comprehensive written and oral examinations over his major and minor areas of study to ascertain his capacity for independent, productive, scientific work and to determine whether further courses are to be required before he undertakes the final year of work toward the doctorate. The examination is conducted by the guidance committee, which submits in writing to the Dean of the Graduate School its decision on the candidate's performance, competence, and general qualifications. The candidate cannot be admitted to the examination until he has (*a*) demonstrated reading knowledge of one foreign language, (*b*) completed 36 quarter units of coursework beyond the master's degree or its equivalent, and (*c*) been recommended in writing by the chairman of his major department.

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

Failure

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

TIME LIMIT

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 ten years from the date when the course was completed. In exceptional cases credit may be given for nullified courses after such refresher provisions as reading, reports or conferences to bring the student up to date, and generally reexamination.

The time lapse from first enrollment in a graduate curriculum to the conferring of the master's degree may not exceed five years; from advancement to candidacy to the conferring of the degree may not exceed three years. For the doctor's degree, candidacy lapses five years after the date of admission to candidacy. A student desiring reinstatement must reapply to the Dean. This procedure implies a reevaluation of the student's total program.

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 his topic and research design as early as is feasible. Such approval must be secured before he petitions for advancement to candidacy.

Handbook

Instructions for the preparation and format of the thesis or dissertation are in the *Handbook for Graduate Students* available at the office of the Dean. 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 three copies to be deposited in the University library and the appropriate department or School collection. Personal copies are bound at the student's expense.

Registration for thesis supervision

The student registers and pays tuition for the thesis whether the work is done in residence or in absentia. If he has been advanced to candidacy, has completed all course requirements, and has registered for but not completed his research and thesis or dissertation, he maintains continuous registration for Thesis Supervision until the thesis or dissertation has been accepted.

GRADUATION ATTENDANCE

A candidate for a graduate degree is expected to attend all public exercises that constitute 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 be granted only by the President.

SCHOLASTIC STANDING

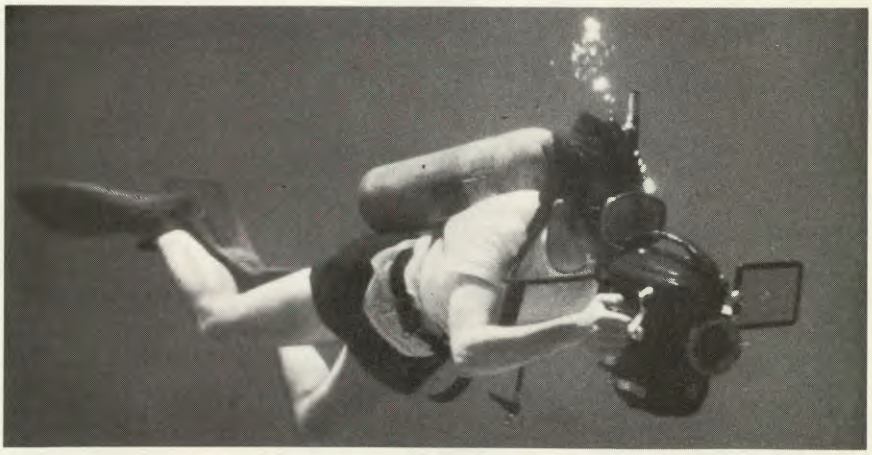
The following values are assigned for calculation of the grade point average per unit of enrollment:

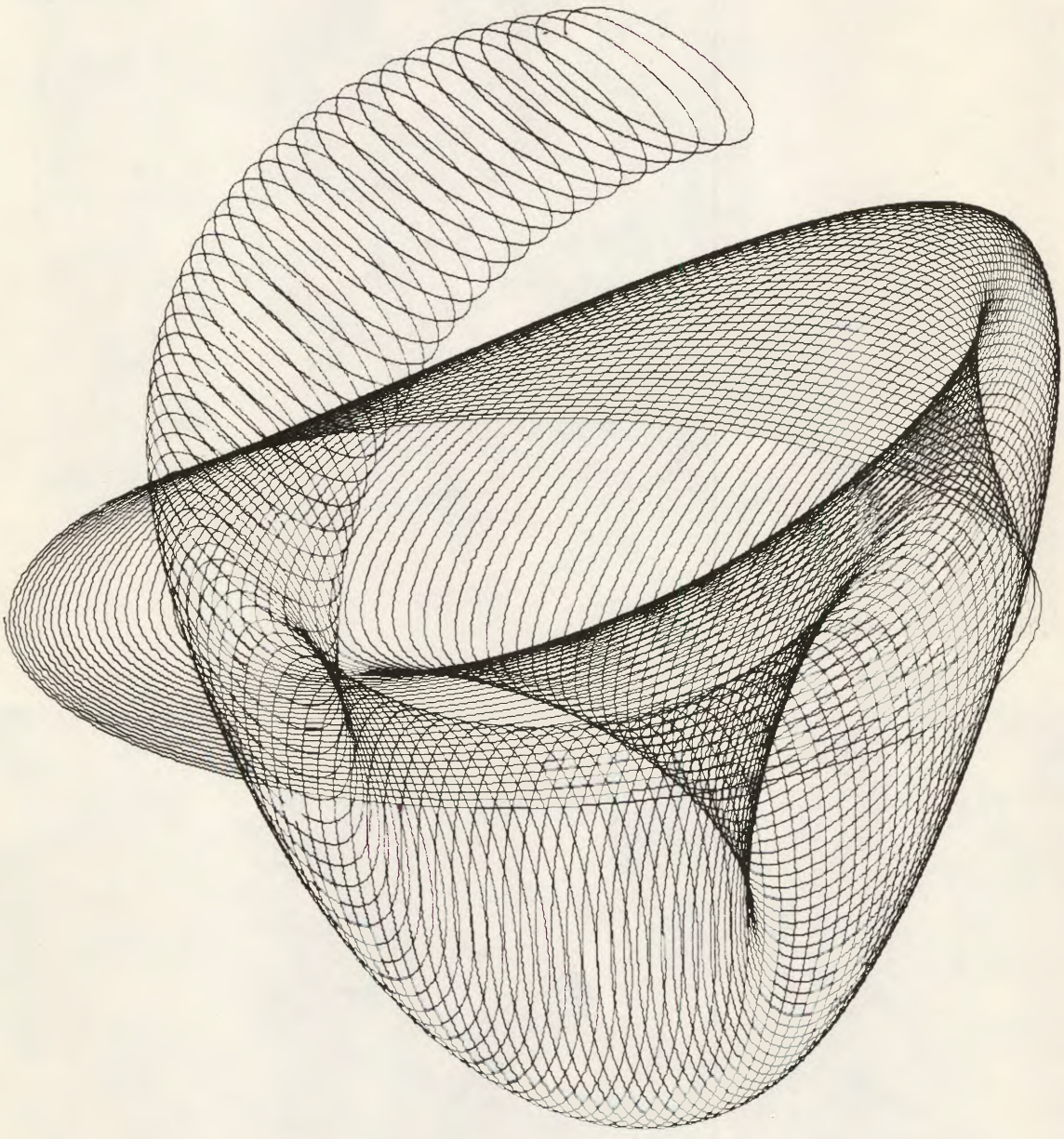
A	4.0	B	3.0	C	2.0	D	1.0
A−	3.7	B−	2.7	C−	1.7	NC	0
B+	3.3	C+	2.3	D+	1.3		

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 requiring more than one term)
S	satisfactory (used in pass-fail courses)
NC	no credit

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.





II

Anatomy

Biochemistry

Biology

Communicative Disorders

Dentistry

English

History

Marriage, Family, and Child Counseling

Mathematical Sciences

Medical Technology

Microbiology

Middle Eastern Studies

Nursing

Nutrition

Pharmacology

Physiology

Psychiatry

Religion

Sociology, Anthropology

AT THIS POINT in the BULLETIN the student is reminded to make sure always to look in both directions before proceeding — look ahead to the specific area requirements of his 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.

For 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 his 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	MICR	Microbiology
ANTH	Anthropology	NRSG	Nursing
BCHM	Biochemistry	NUTR	Nutrition and Dietetics
BIOL	Biology	ORMD	Oral Medicine
BIOM	Biomathematics	ORPA	Oral Pathology
CMDS	Communicative Disorders	ORSR	Oral Surgery
EDCI	Education	ORDN	Orthodontics
ENDN	Endodontics	PATH	Pathology
ENGL	English	PERI	Periodontics
ENVH	Environmental Health	PHRM	Pharmacology
EPDM	Epidemiology	PHSL	Physiology and Biophysics
GRDN	Graduate Dentistry	PSCH	Psychology
HADM	Health Administration	PSYC	Psychiatry
HIST	History	RLGN	Religion, General
HLED	Health Education	RELB	Religion, Biblical Studies
HLSC	Health Science	RELH	Religion, Historical Studies
MFAM	Marriage, Family, Child	RELP	Religion, Professional Studies
MTHS	Mathematical Sciences	RELT	Religion, Theological Studies
MTCH	Medical Technology	SOCI	Sociology
MEST	Middle Eastern Studies	STAT	Biostatistics

FACULTY LISTINGS

Leave of absence is indicated by asterisk (*).

ANATOMY

Faculty

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

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

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

CHARLES W. HARRISON, M.D. Loma Linda University 1915
Associate Professor of Anatomy
Gross anatomy, applied anatomy

GUY M. HUNT, M.D. Loma Linda University 1942; M.S. 1959
Associate Professor of Anatomy and Neurology
Neuroanatomy

PAUL J. MCMILLAN, PH.D. Loma Linda University 1960
Associate Professor of Anatomy
Enzyme histochemistry, histology

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

HOWARD C. SMITH, M.D. Loma Linda University 1932
Associate Professor of Anatomy
Gross anatomy, applied anatomy

ROLAND D. WALTERS, D.D.S. Loma Linda University 1957
Associate Professor of Orthodontics and Anatomy
Gross anatomy, applied anatomy

NORMAN M. CASE, PH.D. Loma Linda University 1958
Assistant Professor of Anatomy
Histology, electron microscopy

ARTHUR E. DALGLEISH, PH.D. Stanford University 1964
Assistant Professor of Anatomy
Embryology, histology

PAUL C. ENGEN, D.D.S. University of Southern California 1949
Assistant Professor of Anatomy
Neuroanatomy, oral histology

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

Graduate courses in anatomy provide opportunities for qualified students to prepare for careers in anatomic research and teaching, for graduate students and prospective clinicians in medicine or dentistry to obtain a thorough preparation in basic anatomic science, and for biologists to specialize in those aspects of biology which are related to anatomy.

The student desiring to register for advanced study in anatomy should have completed an undergraduate major, preferably in zoology or biology; or have had equivalent preparation with a major in a related science; or have earned a professional doctoral degree. In addition to meeting the requirements for admission to the Graduate School, he should present credit or evidence of competence in comparative vertebrate anatomy, vertebrate embryology, physiology, genetics, and an introductory course in college physics and chemistry, or the equivalent.

MASTER OF SCIENCE

For the Master of Science degree the student must complete a minimum of 27 quarter units in anatomy courses (exclusive of research), including 501-503 or 511-514 and 601; 8 units in such other basic science graduate courses as may be recommended by the guidance committee; and 12 in research.

DOCTOR OF PHILOSOPHY

The purpose of the program leading to the Doctor of Philosophy degree is to prepare those called on to teach the morphological aspects of the biomedical sciences or to engage in biomedical research in these areas.

Residence

A minimum of two academic years of work is required beyond the master's level. This is interpreted as six quarters, or the equivalent, of full-time registration (at least 12 units per quarter) in courses, seminars, or research. At least one of these years (three quarters, a minimum of 36 units) must be in residence on the campus at Loma Linda.

In the determination of when a doctorate may be conferred, scholarly attainment and demonstration of the capacity for independent research are considered most important and must be in evidence without presumption as to duration of residence or accumulation of formal credits. In order to obtain full residence credit for any term, the student must give his full time and energy to graduate work. Only with such devotion to his coursework can he fulfill the spirit and the special demands of the program for the Doctor of Philosophy degree.

Required courses

ANAT 511 Gross Anatomy I, 6 units
ANAT 512 Gross Anatomy II, 6 units
ANAT 513 Histology, 6 units
ANAT 515 Neurosciences, 6 units
ANAT 516 Development, 2 units

Additional courses selected in conference with the adviser, in harmony with the student's particular interests.

RLGN ___ Selected to 6 units

A minor in a biological field (e.g., general biology, biochemistry, physiology, pathology, or other), minimum of 20 units.

Comprehensive examination

The comprehensive examination covers coursework in both anatomy and the minor. The student is also expected to show familiarity with current literature in these fields.

Foreign language

The student must demonstrate the ability to read one of the following: German, French, Spanish, or Japanese literature pertaining to his major field of study. A second language, natural or synthetic (Fortran or Basic), especially pertinent to the student's research interest, to be approved by the student's guidance committee, is also required.

Advancement to candidacy

The student may apply for admission to doctoral candidacy after (*a*) meeting the language requirement, (*b*) passing the comprehensive examination, and (*c*) 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 his previous coursework in residence, and on other qualifications for further pursuit of doctoral work.

Dissertation

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

Oral examination

The oral examination is taken when the dissertation content and organization are in final form.

Combined M.D./PH.D. or D.D.S./PH.D. program

Joint programs allow qualified students to work on combined M.D./PH.D. or D.D.S./PH.D. degrees. Details regarding such combinations are provided under the heading Biomedical Science Programs in the section *Programs and Degrees*.

COURSES

ANAT 506 Applied Anatomy of the Head and Neck DN — **3 units**
Intensive review of anatomy of the head and neck. Lectures in clinical perspective, with emphasis on the applications of anatomic information. Laboratory dissections and demonstrations of anatomic material.

ANAT 511, 512 Gross Anatomy — **6, 6 units**
Anatomy of the thorax, abdomen, pelvis, perineum, root of the neck. Anatomy of the neck, head, back, upper extremity, lower extremity. Correlated with radiology and physical diagnosis.

ANAT 513 Histology — **6 units**
The basic cells, tissues, and organs of the human body.

ANAT 515 Neuroanatomy — **6 units**
A foundation of basic neuroanatomy.

ANAT 516 Development — **2 units**
Study of normal embryological development from conception through the embryonic period.

ANAT 522 Osteology — **2 units**
Minute detail of the cranial and facial bones, including the embryonic origin of each bone and its growth centers and articulations.

ANAT 523 **Anatomy of Motion** **3 units**

Anatomy and functional dynamics of muscles. Laboratory observation of electromyographic clinical studies.

ANAT 524 **Applied Gross Anatomy** **5 units**

A study of human morphology, with emphasis on clinical applications. Laboratory study of prepared dissections.

Prerequisite: ANAT 511, 512.

ANAT 525 **Gross Anatomy of the Head and Neck** **5 units**

A detailed dissection of the head and neck. Demonstrations and lectures.

Prerequisite: ANAT 511, 512 or 501.

ANAT 526 **Head and Neck Anatomy (Surgical)** **2 units**

ANAT 529 **Basic Oral Histology** **2 units**

Lectures and laboratory studies in the development and cellular structure of the face, oral cavity, and teeth, with their supporting elements.

Engen.

ANAT 541 **Human Embryology** **3 units**

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.

Dalgleish.

ANAT 547 **Histochemistry** **3 units**

The theoretical and practical aspects of histochemical methods as applied to tissue sections. One lecture and one three-hour laboratory-conference weekly.

Prerequisite: A course in biochemistry; ANAT 513.

McMillan.

ANAT 549 **Molecular Cytology and Topographical Chemistry** **3 units**

Selected aspects of the functional and chemical morphology of cells and organs; lectures and literature seminars.

Prerequisite: Courses in biochemistry and histology.

McMillan.

ANAT 581 **Special Topics in Anatomy** **arranged**

An intensive study of a selected topic approved by the chairman of the department; individual guidance by a staff member.

ANAT 601 **Seminar in Anatomy** **3 units**

Reviews of literature; presentations and discussions of the results of individual investigations.

Required of graduate students.

ANAT 691 **Research** **arranged**

ANAT 693 **Thesis** **arranged**

ANAT 695 **Dissertation** **arranged**

BIOCHEMISTRY

Faculty

R. BRUCE WILCOX, PH.D. University of Utah 1962
Chairman. Professor of Biochemistry
Metabolism of steroid hormones, biochemistry of the endocrine system

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

RICHARD E. BELTZ, PH.D. University of Southern California 1955
Professor of Biochemistry
Nucleic acids, genetic aspects of metabolism

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

RENE EVARD, PH.D. Michigan State University 1959
Associate Professor of Biochemistry
Enzymology

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

CHARLES W. SLATTERY, PH.D. University of Nebraska 1965
Associate Professor of Biochemistry
Physical chemistry of macromolecules

DAVID J. GUSSECK, PH.D. University of California at Davis 1969
Assistant Professor of Biochemistry
Membrane exchange, mechanisms of hormone action

E. CLIFFORD HERRMANN, PH.D. Virginia Polytechnic Institute 1970
Assistant Professor of Biochemistry
Nucleic acid metabolism

GEORGE M. LESSARD, PH.D. University of California at Riverside 1973
Assistant Professor of Biochemistry
Amino acyl t-RNA synthetases, nucleic-acid protein interactions, protein synthesis

Programs

The Department of Biochemistry offers study programs leading to the Master of Science and the Doctor of Philosophy degrees. Tailored to individual interests, the programs provide a broad biochemistry background and yet allow the student latitude for full development of a special area of interest. The Master of Science degree prepares the graduate for teaching at a secondary school of community college level or for pursuing a career as a research technician. The Doctor of Philosophy degree is designed to prepare the graduate for a career of independent research and teaching.

Alternate study plans are available to those preparing for the Master of Science degree.

M.S. program A

Under Plan A, the student completes at least 30 units of coursework in biochemistry and takes additional courses to meet the unit requirement for the degree. A minor may be chosen in a related field or in the biomedical sciences.

M.S. program B

Under Plan B, the student completes at least 30 units of coursework in biochemistry and carries out research leading to the preparation and successful defense of a thesis or a publishable scientific paper reporting on his research.

PH.D. program

For the Doctor of Philosophy degree, the student is expected to complete at least 20 units of biochemistry coursework beyond the general course (511, 512). In addition, he takes sufficient coursework to complete a minor in chemistry or the basic medical sciences. He must pass written and oral examinations covering all other areas deemed appropriate by the guidance committee. The student must present and defend a research proposal and carry out research leading to the preparation and successful oral defense of a dissertation. Opportunity is given to acquire teaching experience in the program. Involvement in research begins during the summer following the first year of the program.

Combined program

In the combined M.D./PH.D. and D.D.S./PH.D. programs, the requirement for a minor may generally be fulfilled by the professional degree. The department may choose to ask the student to take courses to cover certain deficiencies.

Biochemistry minor

A minor in the department consists of general biochemistry (511, 512) and one or more of the core courses of the graduate curriculum.

Admission

Applicants to the programs of the department must meet the prerequisites listed and must pass entrance examinations demonstrating adequate background in cell and organismal biology and a general knowledge of chemistry, with emphasis in the areas of organic and physical chemistry.

Prerequisites

To qualify for admission to the programs of the department, the student must have taken the following courses or their equivalents:

Calculus (131, 132, 231), 12 units
General physics (211, 212, 213), 12 units
Organic chemistry (345, 346, 347), 12 units
Physical chemistry (361, 362, 363), 12 units
General biology (101, 102, 103), 12 units
Upper division biology, 4 units

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 pending successful elimination of the deficiency before taking advanced courses in the department.

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 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

BCHM 511, 512 General Biochemistry — **6, 4 units**
A prerequisite to all other courses in the department.

BCHM 521 Advanced Biochemistry — **4 units**
Physical biochemistry.

BCHM 522 Advanced Biochemistry — **4 units**
Metabolism and regulation.

BCHM 523 Advanced Biochemistry — **4 units**
Molecular biology.

BCHM 531 Techniques of Biochemistry — **4-6 units**
Graduate laboratory course (open to majors only).

BCHM 541 Special Topics in Biochemistry — **2 units**
Content variable. May be repeated for credit.

BCHM 601 Seminar in Biochemistry — **1 unit**
Special topics and individual reports dealing with recent developments.

BCHM 691 Research — **arranged**

BCHM 693 Thesis — **arranged**

BCHM 695 Dissertation — **arranged**

BIOLOGY

Faculty

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

KENNETH A. ARENDT, PH.D. Boston University 1955
Professor of Physiology and Biophysics
Microcirculatory physiology

IAN M. FRASER, PH.D. Cambridge University 1952
Professor of Pharmacology
Cell physiology

ROBERT L. NUTTER, PH.D. Iowa State University 1957
Professor of Microbiology
Molecular biophysics, virology

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

RAYMOND E. RYCKMAN, PH.D. University of California at Berkeley 1960
Professor of Microbiology
Entomology, parasitology, systematics

EDWARD D. WAGNER, PH.D. University of Southern California 1953
Professor of Microbiology
Parasitology

ELMER A. WIDMER, PH.D. Colorado State University 1965
Professor of Environmental and Tropical Health
Public health parasitology

CHARLES E. WINTER, PH.D. University of Maryland 1947
Professor of Microbiology
Bacteriology, immunology

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

JAN W. KUZMA, PH.D. University of Michigan 1963
Associate Professor of Biostatistics
Biostatistics

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

NORMAN L. MITCHELL, PH.D. University of Western Ontario 1967
Associate Professor of Biology
Ultrastructure of fungi

ROBERT L. SCHULTZ, PH.D. University of California at Los Angeles 1957
Associate Professor of Anatomy
Electron microscopy

NORMAN M. CASE, PH.D. Loma Linda University 1958
Assistant Professor of Anatomy
Histology, electron microscopy

ARTHUR V. CHADWICK, PH.D. University of Miami 1969
Assistant Professor of Biology
Cellular and molecular biology, plant hormones

CONRAD D. CLAUSEN, PH.D. Loma Linda University 1972
Assistant Professor of Biology
Invertebrate zoology

ARTHUR E. DALGLEISH, PH.D. Stanford University 1964
Assistant Professor of Anatomy
Embryology

YUK LIN HO, PH.D. Harvard University 1962
Assistant Professor of Microbiology
Molecular biology

ELWOOD S. MCCLUSKEY, PH.D. Stanford University 1959
Assistant Professor of Physiology and Biophysics
Comparative physiology, entomology

BERNEY R. NEUFELD, PH.D. Indiana University 1968
Assistant Professor of Biology
Genetics

JOHN K. TESTERMAN, PH.D. University of California at Irvine 1971
Assistant Professor of Biology
Comparative physiology

The Department of Biology offers programs leading to the degrees of Master of Arts and Doctor of Philosophy. The 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 must be undertaken, particularly in relation to the conduct of original and significant 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 of the areas of specialization include: animal behavior, animal physiology, ecology, entomology, genetics, histology and cytology, mammalogy, bacteriology, virology, parasitology, and plant science, particularly mycology, plant physiology, and plant ecology. Thus, study in various areas, ranging from molecular biology to natural history, is available to the student seeking to prepare himself 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 in Griggs Hall and adjacent buildings. Equipment available for research application includes controlled environment rooms, greenhouse facilities, plant growth chambers, electron microscopes, x-ray microscope, spectrophotometers, spectrofluorometer, ultracentrifuges, refrigerated centrifuges, radioisotope equipment, electronic apparatus for physiological measurements, chromatography equipment, and sound spectrograph. The University computer facilities are also available.

Field stations

Through the cooperation of Pacific Union College and Walla Walla College, the marine field stations operated by these institutions at Albion, California, and Anacortes, Washington, are available for coursework and research by graduate students of this University. The department operates a tropical field station in southern Mexico for use in research and special courses in biology.

Summer program

Because many persons, especially secondary school teachers, pursue graduate programs during the summer months only, the department schedules a program that makes it possible for a student to complete a Master of Arts program entirely in the summer months. A well prepared student should be able to complete the requirements for this degree in four summers of full-time work, or in one school year and one or two summers. This program includes original research experience, which aids in acquiring firsthand understanding of scientific methods, and supplies resources for guidance of secondary school science projects.

The biology coursework and research for a Master of Arts in the teaching of biology (offered through the School of Education) may also be taken in the biology graduate program.

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 assistantships are available with certain research projects of staff members. Further information can be obtained from the chairman of the department.

Dr. Edmund C. Jaeger has provided a perpetual endowment fund that permits the yearly awarding of the *Edmund C. Jaeger Fellowship in Biology* to meritorious students.

Minimum grade requirement

A minimum grade point average of 3.00 (B) in all research courses (research, thesis, dissertation, seminar, special problems, and research techniques) and in all formal courses (computed separately) is required for a degree. A student who has not earned a B average after taking 60 units of graduate work at the University is not recommended for a degree. No course with a grade below C (2.00) can apply on a degree.

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 this BULLETIN.

MASTER OF ARTS

Admission Applicants must meet the general Graduate School admission requirements. Acceptable undergraduate preparation includes a Bachelor of Arts degree from an accredited college, with a biology major or equivalent; one year each of college mathematics and of general chemistry; and at least 20 quarter units from two or more of the following: organic chemistry, biochemistry, general physics, geology, physical chemistry.

Curriculum The following constitute the curriculum for the Master of Arts degree:

During either undergraduate years or graduate: a course in research techniques; a course or research at a marine station (including study of marine biology) or in the tropics (4 quarter units).

Students who plan to enter a Doctor of Philosophy program are urged to acquire reading knowledge of one foreign language.

A minimum of 48 quarter units of graduate work; 30 units in biology, including 15 units at or above the 500 level (exclusive of research). A course in paleontology, or speciation, or history and philosophy of biology, such as BIOL 445, 552, 555 during residence. Seminar in biology, 1 unit; attendance required at all general departmental seminars.

Teaching experience (laboratory teaching during at least one quarter meets this requirement): BIOL 603 recommended.

Research and thesis.

Final oral examination.

DOCTOR OF PHILOSOPHY

Admission The applicant must meet the general Graduate School admission requirements. Acceptable undergraduate preparation in biology must include general biology (or the equivalent), at least one course each in botany, zoology, genetics, and developmental biology. Cognate undergraduate prerequisites include one year of college mathematics (calculus recommended); one year of general physics; chemistry through organic; and at least one of the following: biochemistry, calculus, geology.

Residence A minimum of two academic years of work is required beyond the master's level. This is interpreted as six quarters, or the equivalent, of full-time registration (at least 12 units per quarter) in courses, seminars, or research. At least one of these years (three quarters, a minimum of 36 units) must be in residence on the campus at Loma Linda.

In the determination of when a doctorate may be conferred, scholarly attainment and demonstration of the capacity for independent research are considered most important and must be in good evidence without presumption as to duration of residence or accumulation of formal credits. In order to obtain full residence credit for any term, the student must give his full time and energy to graduate work. Only with such devotion to his coursework and research, with time for reading and reflection, can he fulfill the spirit and the special demands of the program for the Doctor of Philosophy degree.

Required courses

Since the basic preparation for the degree represents the field of biology rather than one of its subsections, no minor is required. However, up to 15 units of work in cognate fields, such as biochemistry or biophysics, may be applied toward the major with the approval of the student's guidance committee.

In addition to the undergraduate biology prerequisites, the following are required at some time in the student's career, during either the undergraduate or the graduate program:

biostatistics
broad biology of at least one particular taxon
advanced genetics
advanced botany
paleontology (at this University)
cell physiology, *or*
cell and molecular biology
animal physiology

two of the following:
- additional paleontology
- biogeography
- advanced invertebrate biology (521)
- advanced philosophy of biology

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 he is in residence at the Loma Linda campus.

During residence the student is required to take a 3-unit course in religion (beyond the master's level). Additional courses in biology or cognate fields are normally desirable as chosen by the student or suggested by his adviser or guidance committee.

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 603 is recommended.

Marine or tropical study

Since the majority of life forms are best represented in the ocean and certain phenomena of biology are best demonstrated in the tropics, a field course or research (at least 4 units) is required in either a tropical or marine environment during either undergraduate or graduate years.

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 microorganisms and an understanding of such fields as are listed under *required courses* (above). It is designed to test the breadth and depth of the student's thinking and philosophy rather than his mere memorization of facts. Wide reading is expected, since it will aid in the student's preparation in areas not covered specifically by courses.

Foreign language

The student must demonstrate the ability to read one of the following: German, French, Russian, or Japanese literature pertaining to his major field of study. A second language, natural or synthetic, especially pertinent to the student's research interest, to be approved by the student's guidance committee, is also required.

Advancement to candidacy

The student may apply for admission to doctoral candidacy after (1) meeting the language 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 his previous coursework in residence, and on other qualifications for further pursuit of doctoral work.

Dissertation

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

Oral examination

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.

Minor in biology

A biology minor for students majoring in other departments may include any courses listed under the Department of Biology except those listed from the department in which the student is taking his major. At least *one course* in the minor must be from among the following primary offerings of the Department of Biology: 515, 519, 521, 538, 544, 545, 552, 555, 582.

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 his graduate work, according to his special interests and needs. See Microbiology, Physiology, Anatomy, and Biochemistry.

JOINT PROGRAMS

Combined M.D./PH.D. or D.D.S./PH.D. program

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. Up to 30 units of credit for basic science coursework 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 "plant or animal physiology" and the "biostatistics" requirements would be met by the professional curriculum.

3. Marine *or* tropical study is required, rather than both.

Combined M.D./M.A. or D.D.S./M.A. program

For students electing a combined program with the Master of Arts earned in biology, up to 12 units of credit for basic science coursework 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.

UPPER DIVISION COURSES APPLICABLE TO GRADUATE PROGRAM

ANTH 301	Physical Anthropology	4 units
BIOL 303	Biological Techniques	3 units
BIOL 314	General Ecology	4 units
BIOL 321	Wilderness Ecology	3 units
BIOL 361	Histology	4 units
BIOL 364	Vertebrate Physiology	4 units
BIOL 379	Protozoology	4 units
BIOL 381	Microbiology	5 units
BIOL 382	Plant Morphology	4 units
BIOL 385	Plant Anatomy	4 units
BIOL 387	Plant Pathology	4 units
BIOL 404	Cellular and Molecular Biology	4 units
BIOL 406	Introduction to Marine Biology	4 units
BIOL 409	Invertebrate Biology	4 units
BIOL 416	Tropical Plant Ecology	4 units
BIOL 421	Human Ecology	4 units
BIOL 441	Human Genetics	3 units
BIOL 447	Genetics	4 units
BIOL 461	Vertebrate Biology	4 units
BIOL 465	Ornithology	4 units
BIOL 469	Animal Behavior	4 units
BIOL 472	General Entomology	4 units
BIOL 482	Plant Physiology	4 units
BIOL 483	Mycology	4 units
BIOL 485	Systematic Botany	4 units
BIOL 496	Philosophy of Science	4 units
BIOL 499	Projects and Topics in Biology	3 units

ANAT 541 Human Embryology **3 units**

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.

Dalgleish.

ANAT 549 Molecular Cytology and Topographical Chemistry **3 units**

Selected aspects of the functional and chemical morphology of cells and organs; lectures and literature seminars.

Prerequisite: Courses in biochemistry and histology.

McMillan.

BIOL 515 Biogeography **4 units**

Present distribution and past migrations of the natural populations of organisms. Lecture 3 units.

Prerequisite: Biology or systematics of at least two plant or animal taxa desirable.

Lathrop.

BIOL 516 Readings in Biogeography **2 units**

Critical analysis of selected current or classic papers. May be taken more than once for credit.

Prerequisite: Biogeography or consent of the instructor.

McCluskey.

BIOL 518 Readings in Ecology **2 units**

Study, analysis, and discussion of current and classic papers.

Prerequisite: Ecology or consent of the instructor.

Lathrop.

BIOL 519 Advanced General Ecology **4 units**

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.

Prerequisite: Field biology or general ecology.

Lathrop.

BIOL 521 Advanced Invertebrate Biology **3 units**

A critical investigation of contemporary invertebrate phylogenetic schemes. Analysis of pertinent information from morphology, embryology, physiology, biochemistry, and paleontology. Three class hours.

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

Clausen.

BIOL 525 Selected Topics in Marine Biology **2 units**

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.

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

Clausen.

BIOL 536 Seminar in Animal Behavior **2 units**

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

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

Brand.

BIOL 538 Mammalogy **4 units**

A study of the mammals of the world, with emphasis on North America. Includes classroom and field study of systematics, distribution, behavior, and ecology. Lecture 2 units, laboratory 2 units.

Prerequisite: General biology or zoology.

Brand.

BIOL 544 Biosystematics and Speciation **5 units**

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

Prerequisite: Coursework in one or more taxa.

Ryckman.

BIOL 545 Developmental Genetics **4 units**

A study of the action and interaction of genes and gene products in development of morphology and function. Particular attention to the controlling mechanism of morphogenesis.

Prerequisite: BIOL 464 or 404 and 447 or consent of the instructor.

Neufeld.

BIOL 546 Advanced Studies in Genetics **2 units**

An in-depth examination of selected problems in genetical research in which current investigations are yielding significant results.

Prerequisite: Genetics or consent of the instructor.

Neufeld.

BIOL 551 Philosophy of Creation **2 units**

Presentation of a positive approach to Creation, with discussion of its philosophical, theological, and scientific implications.

Prerequisite: Consent of the instructor.

BIOL 552 History and Philosophy of Biology **3 units**

A study of selected topics in the history and philosophy of biology, especially as related to contemporary concepts.

Roth.

BIOL 555 Problems in Paleontology **4 units**

Lectures and fieldwork on selected topics in paleontology, with special emphasis on distribution.

Prerequisite: Graduate standing.

BIOL 556 Paleobotany **2 units**

Lectures, laboratory, and field study in paleobotany, with emphasis in palynology.

Prerequisite: A course in botany.

Chadwick.

BIOL 582 Physiology and Development of Plants **4 units**

Consideration of photobiology, metabolism, and regulation of development in plants.

Prerequisite: Background in cellular or molecular biology.

Chadwick.

BIOL 585 Advanced Studies in Plant Hormones **2 units**

An in-depth examination of selected problems in plant hormone research in which current investigations are yielding significant results.

Prerequisite: Background in plant physiology or consent of the instructor.

Chadwick.

BIOL 601 Seminar in Biology **1 unit**

Selected topics dealing with recent developments.

BIOL 603 College Biology Teaching **3-4 units**

One class meeting each week for discussion of or lecture on methods of teaching. Student assigned responsibility for one or two laboratory sections or selected lecture sessions of an undergraduate course for one quarter. Fulfills requirement for teaching experience.

Prerequisite: At least one quarter of graduate study and consent of the instructor.

BIOL 605 Special Problems in _____ **1-4 units**

Responsibility for a special project in the field, laboratory, museum, or library. Registration must designate one of the following specific fields: ecology, animal physiology, parasitology, mammalogy, ornithology, entomology, plant physiology, mycology, systematics, biogeography, animal behavior, genetics, history and philosophy of biology, invertebrate zoology, or cytology.

BIOL 611 **Research Techniques in Biology** **1 unit**

Concepts and methods used in biological research, including scientific writing and literature.

BIOL 691 **Research** **arranged**

BIOL 693 **Thesis** **arranged**

Registration for the terminal part of the master's thesis should be under this number.

BIOL 695 **Dissertation** **arranged**

Registration for at least the terminal part of the doctoral dissertation research should be under this number.

BIOM 581, 582, 583 **Biophysical Systems Analysis** **3, 3, 3 units**

Linear systems analysis, continuous and sampled data systems, feedback and servomechanisms, dynamic and steady-state response, stability criteria, technological and biological systems, computer modeling, introduction to nonlinear systems analysis.

Prerequisite: BIOM 501, 502, 503 or the equivalent.

STAT 401 **General Statistics** **3 units**

Fundamental procedures in collecting, summarizing, presenting, analyzing, and interpreting data. Measures of central tendency and variation, probability, binomial distribution, normal distribution, sampling, confidence intervals, hypothesis testing, t-test, chi-square, and correlation and regression. Laboratory for practical application of techniques.

Prerequisite: Algebra.

STAT 521 **Biostatistics I** **4 units**

Fundamental procedures of collecting, tabulating, and presenting data. Measures of central tendency and variation, normal distribution, sampling, t-test, confidence intervals, chi-square, and correlation and regression. Emphasis on statistical inference.

Prerequisite: Algebra.

STAT 522 **Biostatistics II** **4 units**

Analysis of variance (one-way and k-way classification), correlation and regression (simple, partial, and multiple), covariance analysis, and orthogonal contrasts. Includes 1 unit of laboratory on data processing equipment.

Prerequisite: STAT 521.

STAT 523 **Biostatistics III** **4 units**

Experimental designs, including Latin squares, incomplete block designs, nested designs. Special topics in analysis of variance, including general linear hypothesis, multiple comparisons, and missing data. Includes 1 unit of laboratory on the application of computer programs such as the BMD.

Prerequisite: STAT 522.

STAT 568 **Data Analysis** **2-3 units**

Presentation and use of the most common data analysis methods: correlation and regression, contingency table, variance, and covariance. Student provision of data encouraged. Use of data processing equipment and packaged computer programs.

Prerequisite: STAT 401.

ENVH 501 **Environmental Health Sciences** **4 units**

Principles of environmental sanitation. Emphasis on factors affecting health and disease; possible modification of the environment for the promotion of health. Lectures, field trips, demonstrations. Primarily for students in the Doctor of Health Science program.

Prerequisite: Adequate preparation in biological and physical sciences.

ENVH 565 **Introduction to Air Hygiene and Resources** **3 units**

An introduction to the sources and characteristics of air pollutants and their effects on man and his environment. Consideration of methods used in sampling of air pollutants; control.

Prerequisite: ENVH 401 or the equivalent.

ENVH 568 Water and Waterborne Wastes **3 units**

A study of the principles and processes involved in providing safe and adequate water supplies and waste disposal facilities in municipal and rural locations. The effects of polluted waters on rivers, lakes, and the sea.

Prerequisite: ENVH 401 or the equivalent.

ENVH 569 Environmental Health Laboratory **4 units**

A course to provide practical laboratory experience that will serve as an introduction to the techniques used in measurement and evaluation of environmental health problems. Techniques pertinent to air, water and food sanitation, industrial hygiene, and radiological health. Two lectures and two laboratories per week.

Prerequisite: ENVH 401 or the equivalent.

HLSC 536 Behavioral Physiology **3 units**

An approach to human behavior from the point of known neural and endocrine mechanisms and their interaction with the external and internal body environment. Discussion of stress control, environmental enrichment, appetite control, drug behaviors, cybernetics, motivation, memory, learning, psychosomatic mechanisms, personality, and character achievement.

Baldwin.

MICR 531 Microbial Physiology **4 units**

A study of the growth and nutrition of microorganisms; the effect of physical and chemical environment on the bacterial cell and the mechanisms of survival and virulence.

Ho.

MICR 532 Molecular Biology of Microorganisms **4 units**

DNA replication; the genetic coding of information, its transfer from DNA through RNA to protein, and the regulatory mechanisms of expression of genetic functions, with specific emphasis on microorganisms.

Ho.

MICR 551 Bacteriophage Genetics **3 units**

Bacteriophages as a genetic system; lysogeny; transduction; use of bacteriophages in analysis of genetic fine structure.

Bullas.

MICR 552 Microbial Genetics **3 units**

Genetic processes of microorganisms, including molds, protozoa, and bacteria. The contribution that the study of microorganisms has made in modern genetics toward the understanding of the nature of the genetic material and the mechanism of its action.

Bullas.

MICR 553 Microbial Genetics Laboratory **2 units**

Laboratory exercises in bacterial and bacteriophage genetics.

Prerequisite: Microbial genetics or bacteriophage genetics.

Bullas.

MICR 561 Bacterial Virology **3 units**

Introduction to both the virulent and the temperate bacteriophages. The dual nature of viruses as inert particles and as active constituents of functional cells. The physical-chemical approach; the cell-physiological concept.

Nutter.

MICR 562 Animal Virology **4 units**

Fundamental aspects of the animal virus-host cell relationship of selected groups of animal viruses. Principles of cell culture and virus serology.

Nutter.

MICR 563 Cell Culture **3 units**

The practical aspects of the growth of animal cells in culture. Experience with both primary cell cultures and established cell lines.

Nutter.

MICR 571 **Arthropod Vectors of Infectious Agents** **5 units**

Vector potential of insects, ticks, and mites. Importance of ecology and biosystematics to host-parasite relationships.

Ryckman.

MICR 572 **Arthropod Vectors Laboratory** **1-2 units**

Ryckman.

MICR 575 **Field Medical Entomology** **3 units**

The ecology and host relationships of medically important arthropods under field conditions. Emphasis on habitat and host recognition and identification of the parasitic forms.

Ryckman.

MICR 584 **Helminthology** **4 units**

Important aspects of the parasitic helminths of animals, particularly the vertebrates. Special consideration of taxonomy, morphology, life histories, host-parasite relationships, and special techniques in the preparation of specimens for study.

Wagner.

PHSL 531, 532 **Cell and Molecular Biology** **4, 4 units**

Life processes fundamental to animal, plant, and microorganism; a graduate-level introduction. Lecture 3 units, laboratory 1 unit each term.

Prerequisite: Organic chemistry and one of the following: biochemistry, molecular biology, or cell biology; physics desirable.

McCluskey, Hall, Chadwick.

PHSL 535 **Comparative Physiology** **5 units**

A comparison of the major animal groups, from protozoa to mammals. Lecture 4 units, laboratory 1 unit.

Prerequisite: Zoology (preferably invertebrate); physiology (or biochemistry).

McCluskey.

PHSL 536 **Readings in Comparative Physiology** **1 unit**

Critical analysis of selected current or classic papers. Credit variable. May be taken more than once for credit.

Prerequisite or concurrent: A course in physiology.

McCluskey.

PHSL 539 **Readings in Circadian Rhythms** **1-2 units**

Analysis of selected recent papers. Designed to lead to careful interpretation of the literature in other fields and to an improvement of the design of one's own research.

McCluskey.

COMMUNICATIVE DISORDERS

Faculty

BRIAN J. JACQUES, PH.D. University of Michigan 1965
Chairman, Professor of Speech

W. FLETCHER TARR, PH.D. University of Denver 1957
Professor of Speech Pathology
Aphasiology, phonatory disorders

E. EVELYN BRITT, SC.D. Johns Hopkins University 1963
Associate Professor of Speech Pathology and Audiology
Hearing and language disabilities in pediatrics

RONALD W. GREENLAW, PH.D. University of Utah 1970
Associate Professor of Speech Pathology
Fluency disorders, phonatory disorders

KENNETH R. LUTZ, PH.D. University of Pittsburgh 1962
Associate Professor of Speech Pathology and Audiology
Emergent language, oral-facial anomalies

RODNEY R. ROWLEY, PH.D. University of Oklahoma 1966
Associate Professor of Audiology
Medical audiology, psychoacoustics

LOGAN W. BARNARD, PH.D. University of Utah 1971
Assistant Professor of Speech Pathology
Oral-facial anomalies

MELVIN S. COHEN, PH.D. University of Utah 1973
Assistant Professor of Speech Pathology
Phonatory disorders, stuttering, language development

Lecturer

JACK L. HARTLEY, M.A. University of Southern California 1973
Lecturer in speech pathology

The purposes of the graduate programs are to offer preparation for careers in the professional practice of speech pathology and audiology, 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 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 La Sierra and Loma Linda campuses and of affiliated agencies provide opportunity to obtain breadth of experience in a variety of settings. Study in related disciplines at the advanced level is available through the offerings of other departments of the College of Arts and Sciences, the professional schools of the University, and the Graduate School.

Admission

Acceptable undergraduate preparation includes courses in language and language development, in speech sciences, in behavioral sciences, and in introductory speech pathology and audiology. Applicants whose records show subject deficiencies in one or more of these areas may be admitted; but before they are advanced to candidacy for the master's degree they must make up all deficiencies. Subjects required to make up deficiencies are indicated to the applicant (in writing) at the time of acceptance. Subject areas considered the foundation for effective graduate study include:

Development of speech and language
Transcription phonetics
Semantics
Psycholinguistics
Developmental psychology
Psychological testing
Speech and language disorders
Hearing, hearing problems, and basic audiometry

The applicant with an undergraduate major in communicative disorders should plan to take four or more quarters to complete requirements for the master's degree. The applicant with a major in another field, or with subject deficiencies, should expect to take five or more quarters.

Program

Graduate study in communicative disorders leads to the Master of Science degree with a major in speech pathology or in audiology. The program for the degree 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 Pathology or Audiology, or (*b*) to prepare for doctoral study or careers in related fields. The student who is preparing to work in the public schools should consult with his adviser in the selection of elective courses.

Degree requirements

The following are the requirements for the degree Master of Science with a major in speech pathology or audiology:

1. A minimum of 3 quarters in residence as a graduate student.

2. A minimum of 48 quarter units, including: (*a*) 24 units in the area of primary concentration (speech pathology *or* audiology), with a minimum of 20 of these units in content courses and seminars restricted to graduate students; (*b*) content course or seminar restricted to graduate students, 3 units in the area of secondary concentration (speech pathology *or* audiology); (*c*) a course in research methods; (*d*) a course in religion, 3 units; (*e*) additional units in communicative disorders and cognate areas as approved by the guidance committee, with not more than 4 units of clinical practice applicable toward the degree.

3. Selection and completion of an emphasis — clinical (option A) or nonclinical (option B).

4. Selection and completion of a research option — with thesis (option A) or oral report (option B).

5. Satisfactory completion of laboratory assignments prescribed by the guidance committee.

6. Satisfactory completion of written and oral comprehensive examinations.

7. Maintenance of a general grade point average of 3.00. (The student whose grade point average is below 3.00 for two consecutive quarters, or who has more than 9 units of C, is not recommended for candidacy.)

EMPHASIS

Clinical option A
Nonclinical option B

Option A completes all course and clinical requirements for the Certificate of Clinical Competence in a primary area of concentration (speech pathology *or* audiology), including: (*a*) the minimum units specified for fundamental studies, primary area of specialization, secondary area of specialization, and related studies; (*b*) the minimum units for courses at the graduate level; (*c*) the minimum clock hours of supervised clinical practice during the graduate program; (*d*) the minimum total clock hours of supervised clinical practice for both undergraduate and graduate programs.

Option B, for a nonclinical emphasis, completes a minimum of 15 units for a minor as approved by the guidance committee.

RESEARCH

Thesis option A
Oral report option B

Option A calls for completion of research and a thesis (CMDS 692, a maximum of 6 units applicable toward the degree) and an oral examination.

Option B calls for completion of research (CMDS 691, a maximum of 4 units applicable toward the degree) and an oral presentation of the project.

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

UPPER DIVISION COURSES APPLICABLE TO GRADUATE PROGRAM

CMDS 475	Acoustic and Physiologic Phonetics	3 units
CMDS 481	Organic Speech Disorders	4 units
CMDS 482	Neurological and Language Pathology	4 units
CMDS 483	Rhythm and Fluency Disorders of Speech	4 units
CMDS 484	Phonatory Disorders	4 units
CMDS 485	Procedures and Materials in Speech and Language Pathology	3 units
CMDS 486	Diagnostic Methods in Speech and Language Pathology	3 units
CMDS 487	Clinical Practice in Speech Pathology	1-3 units
CMDS 488	Directed Teaching in Speech Pathology	1-4 units
CMDS 491	Audiometry	4 units
CMDS 492	Aural Rehabilitation	4 units
CMDS 497	Clinical Practice in Audiology	1-3 units
CMSP 417	Group Dynamics and Leadership	4 units

CMDS 578 Audition and Psychoacoustics 3 units

Study of the processes of response to the acoustic stimulus: nature of stimulus, manner of its presentation, neurophysiology of audition.

CMDS 586 Advanced Diagnostics in Speech Pathology 3 units

Study of the principles of diagnosis applicable to communication; consideration of factors related to patient management in various allied health professional settings.

CMDS 587 Externship 2-4 units

Practicum in rehabilitation centers, clinics, and/or schools. May be repeated.

CMDS 589 Programs Administration in Speech Pathology and Audiology 4 units

Study of the methods of organizing and administering programs relating to evaluative procedures, records, case selection, case load, staff, budget, and interagency cooperation in schools, clinics, and private practice.

CMDS 592 Advanced Audiological Assessment 4 units

Study of the application of psychoacoustics and instrumentation to the selection and use of hearing tests and hearing aids. Experience in the administration of tests for intensive diagnostic and rehabilitation purposes. Measurement and methodology.

CMDS 593 Hearing Aids 3 units

Study of the electromechanical aspects of hearing aids, including acoustical evaluation of hearing aids. Evaluation of patients so as to establish need for amplification; fitting of hearing aids.

CMDS 599 Directed Study 1-3 units

Independent study on a research project selected in consultation with the adviser. For advanced students.

SEMINARS. Analysis of current literature relating to theory, research, and applications within the area of consideration. Since the specific area of study varies from offering to offering, seminars may be repeated for credit. The course schedule and the student's transcript will indicate the specific area of study: for example, Seminar in Speech Pathologies: Cleft Palate.

CMDS 681 Seminar in Speech Pathologies 3 units

CMDS 682 Seminar in Language Pathologies 3 units

CMDS 683 Seminar in Phonatory Disorders 3 units

CMDS 684 Seminar in Oral-Facial Anomalies 3 units

CMDS 685 Seminar in Audiology 3 units

CMDS 687 Seminar in Habilitative Audiology 3 units

CMDS 691 Research (for thesis) arranged

CMDS 692 Research (for report) arranged

CMDS 693 Thesis arranged

DENTISTRY

Faculty

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

CLIFTON R. BROOKS, SR., M.D. University of Wisconsin 1946; M.P.H. University of California at Los Angeles 1970
Professor of Oral Surgery
Oral surgery

RONALD E. BUELL, D.M.D. University of Oregon 1932
Professor of Oral Medicine
Endodontics

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

EDWIN M. COLLINS, D.D.S. University of Nebraska 1949; M.S. University of Southern California 1964 *
Professor of Oral Medicine
Periodontics

FRANCIS V. HOWELL, D.D.S. University of the Pacific 1950; M.S. University of Oregon 1956
Professor of Oral Medicine
Oral pathology

NIELS B. JORGENSEN, D.D.S. University of California at Berkeley 1923
Emeritus Professor of Oral Surgery
Oral surgery

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

EDWARD B. NUTTING, D.D.S. University of Southern California 1940
Professor of Oral Medicine
Endodontics

RICHARD C. OLIVER, D.D.S. University of Minnesota 1953; M.S. Loma Linda University 1962
Professor of Oral Medicine
Periodontics

IRVING RAPPAPORT, D.M.D. University of Louisville 1947; M.D. University of Illinois 1953
Professor of Oral Surgery
Oral surgery

HAROLD E. SCHNEPPER, D.M.D. University of Oregon 1946; M.S. University of Washington 1952
Professor of Restorative Dentistry
Restorative dentistry

RALPH R. STEINMAN, D.D.S. Emory University 1938; M.S. University of Michigan 1953
Professor of Oral Medicine
Oral medicine

DONALD F. ADAMS, D.D.S. University of Southern California 1957; M.S. Loma Linda University 1967
Associate Professor of Oral Medicine
Periodontics

STEVE N. ASAHINO, D.D.S. Loyola University 1958; M.S. 1960
Associate Professor of Orthodontics
Orthodontics

ALDEN B. CHASE, D.D.S. Loma Linda University 1960; M.S. 1963
Associate Professor of Orthodontics
Orthodontics

JOHN P. DEVINCENZO, D.D.S. Loma Linda University 1964; M.S. 1966
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 Surgery
Oral surgery

KARL K. NISHIMURA, D.D.S. Loyola University 1960; M.S. University of Illinois 1962
Associate Professor of Orthodontics
Orthodontics

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

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

RICHARD E. SCHMIDT, D.D.S. Northwestern University 1962
Associate Professor of Oral Medicine
Endodontics

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

JOHN L. TOMLINSON, M.A. University of Oregon 1961; PH.D. University of Washington 1967
Associate Professor of Orthodontics
Materials engineering

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

DANIEL R. YOUNG, D.M.D. University of Oregon 1954
Associate Professor of Oral Surgery
Oral surgery

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

R. LESLIE ARNETT, JR., D.D.S. University of Southern California 1959; M.S. Loma Linda University 1968
Assistant Professor of Oral Medicine
Periodontics

LOGAN W. BARNARD, M.A. Brigham Young University 1960; PH.D. University of Utah 1971
Assistant Professor of Orthodontics
Orthodontics

FRANK W. CHAMBERS, D.D.S. Washington University 1951; M.D.S. University of California at San Francisco 1956
Assistant Professor of Oral Surgery
Oral surgery

ELBERT W. CLARK IV, D.D.S. University of California at San Francisco 1958; M.S. Loma Linda University 1970
Assistant Professor of Oral Surgery
Oral surgery

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

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

RALEIGH R. CUMMINGS, D.D.S. Loma Linda University 1966; M.S. 1970
Assistant Professor of Oral Medicine
Endodontics

LAWRENCE D. DAY, D.D.S. University of Illinois 1953; M.S. Loma Linda University 1969
Assistant Professor of Oral Surgery
Oral surgery

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

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

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

J. RICHARD NIVISON, D.D.S. Loma Linda University 1965; M.S. 1969
Assistant Professor of Orthodontics
Orthodontics

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

JAMES STOKOS, D.D.S. University of Nebraska 1957; M.D. Loma Linda University 1967
Assistant Professor of Oral Medicine
Physical diagnosis

From other departments

BERNARD D. BRIGGS, M.D. Loma Linda University 1940
Professor of Anesthesiology
Anesthesiology

WILLARD R. CENTERWALL, M.D. Yale University 1952; M.P.H., M.S. University of Michigan 1967, 1968
Professor of Pediatrics
Human genetics

Lecturers

JOHN W. BRYANT, D.D.S. University of California at San Francisco 1966
Lecturer in Orthodontics
Orthodontics

ARTHUR A. EWERT, D.D.S. University of the Pacific 1959; M.S. Loma Linda University 1970
Lecturer in Orthodontics
Orthodontics

C. DOUGLAS FOWLER, D.D.S. University of California at San Francisco 1966
Lecturer in Orthodontics
Orthodontics

EBER R. GRAHAM, JR., D.D.S. University of Southern California 1961
Lecturer in Oral Surgery
Oral surgery

ROBERT D. KIGER, D.D.S. Loma Linda University 1970; M.S. University of Oregon 1973
Lecturer in Oral Medicine
Periodontics

JAMES L. KLOSS, D.D.S. Ohio State University 1965; Certificate Boston University 1969
Lecturer in Oral Medicine
Endodontics

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

Endodontics Orthodontics Periodontics
Oral Surgery

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 1.

Residence — The required time in residence is 24 months for all programs except oral surgery, which is 36 months. Candidates for a master's degree should plan on an additional quarter.

Grades — The student must achieve a general grade point average of not less than 3.00, with no subject below 2.00. In addition to earning acceptable scholastic marks, he must give evidence of personal and professional fitness for growth in the science and art of his specialty.

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 he must submit his proposed thesis topic, an outline, and a comprehensive bibliography, as approved by his major professor. If his 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. He may be required to defend his thesis orally.

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.

ENDODONTICS

The graduate program in endodontics prepares the student for a career in the practice of endodontics, teaching, or research. The objective is to help him develop skills and proficiency in endodontics and radiographic diagnosis and to contribute to his understanding of the pathologic conditions that occur in and about the teeth.

Residence — A minimum of 24 months in residence is required, beginning with the summer quarter.

Required courses — The following courses are required:

GRDN 501 Principles of Human Behavior
ORMD 521, 522 Physical Diagnosis
ORMD 531 Cell Structure and Function
ORMD 532 Biochemistry and Physiology of Bone
ORMD 601, 602 Seminar in Microbiology and Immunology
ORPA 531 Basic Oral Pathology
ORPA 607 Head and Neck Tumor Seminar
PHRM 531 Topics in Pharmacology for Dentistry
RLGN A course in religion
STAT 401 General Statistics
ENDN 531 Applied Endodontics
ENDN 601 Literature Seminar in Endodontics
ENDN 625 Clinical Practice in Endodontics
ENDN 651 Practice Teaching in Endodontics
ENDN 691 Research
ENDN 693 Thesis

ORAL SURGERY

The graduate program in oral surgery is designed to prepare the student for the practice of the specialty of oral surgery and to provide the foundation for the continued acquisition of knowledge and skills. The student is introduced to problems of research and teaching to develop an increased awareness of the obligation to make contributions to the growth and status of the profession. The content of the program is designed to conform to the standards outlined by the specialty board.

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

Required courses — The following courses are required:

ANAT 526 Head and Neck Anatomy (Surgical)
ORMD 521, 522 Physical Diagnosis
ORMD 531 Cell Structure and Function
ORMD 532 Biochemistry and Physiology of Bone
ORMD 601, 602 Seminar in Microbiology and Immunology
ORPA 531 Basic Oral Pathology
ORPA 607 Head and Neck Tumor Seminar
PHRM 531 Topics in Pharmacology for Dentistry
RLGN A course in religion
STAT 401 General Statistics
ORSR 521, 522 General Anesthesia
ORSR 531 Oral Surgery I
ORSR 541 Oral Surgery II
ORSR 551 Oral Surgery III
ORSR 625 Clinical Practice in Oral Surgery
ORSR 651 Practice Teaching in Oral Surgery
ORSR 691 Research
ORSR 693 Thesis

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. The content of the program conforms to the standards outlined by the specialty board.

Residence

A minimum of 24 months in residence is required, beginning with the summer quarter.

Required courses

The following courses are required:

ANAT	525	Gross Anatomy of the Head and Neck
GRDN	501	Principles of Human Behavior
GRDN	521	Social Dynamics of Dental Practice
ORMD	531	Cell Structure and Function
ORMD	532	Biochemistry and Physiology of Bone
ORPA	531	Basic Oral Pathology
RLGN		A course in religion
STAT	401	General Statistics
ORDN	521	Introduction to Graduate Orthodontics
ORDN	531	Cephalometrics
ORDN	533	Concepts of Physical Anthropology
ORDN	535	Advanced Cephalometrics
ORDN	541	Growth and Development
ORDN	543	Fundamentals of Occlusion
ORDN	544	Mixed Dentition in Health and Disease
ORDN	547	Human Genetics
ORDN	551	Physiology and Pathology of Speech
ORDN	571	Diagnosis and Treatment Planning
ORDN	591	Current Orthodontics Literature
ORDN	601	Seminar in Orthodontics
ORDN	605	Advanced Seminar in Orthodontics
ORDN	625	Clinical Practice in Orthodontics
ORDN	631	Orthodontics Clinical Conference
ORDN	651	Practice Teaching in Orthodontics
ORDN	691	Research
ORDN	693	Thesis

PERIODONTICS

The graduate program in periodontics is designed to prepare the student for a specialty practice in periodontics and to provide the basis for his continuing growth and development after completion of the program. Additional opportunities are provided for the student with a special interest in research or education to develop his abilities. Emphasis is on the biological basis for clinical practice in terms of knowledge and skills and on the development of attitudes and judgment related to professional and social sensitivity. The program fulfills the requirements of the American Board of Periodontology.

Residence

A minimum of 24 months in residence is required, beginning with the summer quarter.

Required courses

The following courses are required:

ANAT	526	Head and Neck Anatomy (Surgery)
GRDN	501	Principles of Human Behavior
GRDN	521	Social Dynamics of Dental Practice
GRDN	561	Concepts of Occlusion
ORMD	521	Physical Diagnosis
ORMD	531	Cell Structure and Function
ORMD	532	Biochemistry and Physiology of Bone
ORMD	601, 602	Seminar in Microbiology and Immunology
ORPA	531	Basic Oral Pathology
PHRM	531	Topics in Pharmacology for Dentistry
RLGN		A course in religion
STAT	401	General Statistics
PERI	521	Periodontal Therapy
PERI	531	Periodontal Histopathology
PERI	541	Minor Tooth Movement
PERI	561	Occlusion in Periodontics
PERI	601	Seminar in Periodontics
PERI	625	Clinical Practice in Periodontics
PERI	631	Clinical Conference in Periodontics
PERI	641	Hospital Periodontics
PERI	651	Practice Teaching in Periodontics
PERI	691	Research
PERI	693	Thesis

Anatomy

ANAT 525 **Gross Anatomy of the Head and Neck** — 5 units
Walters.

ANAT 526 **Head and Neck Anatomy (Surgical)** — 2 units

Biostatistics

STAT 401 **General Statistics** — 3 units
Fundamental procedures in collecting, summarizing, presenting, analyzing, and interpreting data. Measures of central tendency and variation, probability, binomial distribution, normal distribution, sampling, confidence intervals, hypothesis testing, t-test, chi-square, and correlation and regression. Laboratory for practical application of techniques.
Prerequisite: Algebra.
Yahiku.

Graduate dentistry conjoint courses

GRDN 501 **Principles of Human Behavior** — 2 units
Current theories and principles in psychology related to learning and teaching, personality development and change, and interpersonal process and dynamics.

GRDN 502 **Principles of Instruction and Testing** — 3 units
A survey and practicum in the application of didactic and psychological principles of learning, in the preparation of instructional objectives and materials, and in test construction and evaluation of student performance.

GRDN 521 **Social Dynamics of Dental Practice** — 2 units

GRDN 561 **Concepts of Occlusion** — 2 units

GRDN 581 **Introduction to Research** — 2 units
Orientation in the preparation of the scientific paper; use of the library and other research tools. Lectures by visiting researchers. Student participation in research outlines.
Walters.

Endodontics

ENDN 531 **Applied Endodontics** — 2, 2, 2 units
Principles of endodontics therapy, with emphasis on their application to clinical practice. Relation to other branches of dentistry.
Buell, Nutting.

ENDN 601 **Literature Seminar in Endodontics** — 2, 2, 2 units
A review of the literature. Philosophy of teaching and treatment. Consideration of controversial treatment problems and difficult diagnostic cases.

ENDN 625 **Clinical Practice in Endodontics** — 900-1100 clock hours
Clinical diagnosis and treatment of endodontic cases, with special attention to the more difficult types of cases.

ENDN 651 **Practice Teaching in Endodontics** — 3 units
Closely supervised experience in teaching the undergraduate student of dentistry.

ENDN 691 **Research** — arranged

ENDN 693 **Thesis** — arranged

Oral medicine

ORMD 521, 522 **Physical Diagnosis** **2, 2 units**

Methods of recognizing normal and abnormal physical conditions, studied so as to develop the dentist's general medical knowledge. Attention to blood diseases, systemic diseases, and cardiac disturbances.

Stokos.

ORMD 531 **Cell Structure and Function** **3 units**

A study of how reproducing living cells maintain themselves in a steady state relative to their environment.

ORMD 532 **Biochemistry and Physiology of Bone** **2 units**

Recent concepts and proposed mechanisms for the mineralization and demineralization of bone tissue. Application to periodontal disease, surgical bone healing, and orthodontic tooth movement.

Rathbun.

ORMD 601, 602 **Seminar in Microbiology and Immunology** **2, 2 units**

Current concepts of microbiology and immunology as they relate to dental disease.

Rathbun.

Oral pathology

ORPA 531 **Basic Oral Pathology** **3 units**

Emphasis on oral manifestations of disease. Diagnosis, prognosis, and treatment of various oral neoplasms.

ORPA 607 ~~Head and Neck Tumor Seminar~~ Oral Problem Board **1, 1, 1, 1 units**

Observation of head and neck tumors in various clinical stages; the best treatment for a given cancer problem; a systematized follow-up study.

Oral surgery

ORSR 521, 522 **General Anesthesia** **3, 3 units**

Study and experience in the use of general anesthetic agents on hospital surgery patients. Physiological action of the agents, methods of administration, premedication, armamentarium, complications, and accidents.

ORSR 526, 527 **Anesthesia and Premedication** **2, 2 units**

Instruction in general and local anesthesiology, with emphasis on intravenous sedation and inhalation analgesia.

ORSR 531 **Oral Surgery I** **2, 2, 2, 2 units**

The principles of exodontics and the evaluation and treatment of alveolar disease. Minor oral surgery procedures studied, outlined, and performed under local anesthesia, with emphasis on the theory and application of intravenous premedication. Treatment of emergencies in oral surgery practice. Introduction to hospital procedures, assistance on staff hospital cases, and attendance at specified conferences for the School of Medicine.

Byrd.

ORSR 541 **Oral Surgery II** **2, 2, 2, 2 units**

Major oral surgery procedures. Hospital procedures, treatment of the hospitalized patient, diagnosis and treatment of fractures of the jaws, and introduction to ambulant or outpatient general anesthesia for oral surgery. Rotation to other medical and surgical services in the hospital.

Byrd, Clark.

ORSR 551 **Oral Surgery III** **2, 2, 2, 2 units**

Treatment of complicated fractures of the jaws; surgical correction of developmental or acquired deformities of the jaws; study and application of principles of general anesthesia on the outpatient or ambulant oral surgery patient; and legal aspects of an oral surgery practice.

Byrd, Clark.

ORSR 601 **Seminar in Oral Surgery** **1 unit**

Byrd.

ORSR 625 **Clinical Practice in Oral Surgery** **1800 clock hours**

Experience in diagnosing and treating simple and complicated oral surgery problems.

Byrd, Chambers, Clark.

ORSR 651 **Practice Teaching in Oral Surgery** — **2 units**
Byrd.

ORSR 691 **Research** — **arranged**

ORSR 693 **Thesis** — **arranged**

Orthodontics

ORDN 521 **Introduction to Graduate Orthodontics** — **12 units**
Outline of the principles of appliance design, the application of forces to produce tooth movement, and the tissue response to such forces. Lecture-laboratory.
Pearson, Wise.

ORDN 522 **Materials Science and Mechanics** — **2 units**
Structure and properties of materials used in orthodontics. Analysis of the effects of mechanical and heat treatments. Survey of strength materials and mechanics in force-delivery systems.

ORDN 531 **Cephalometrics** — **2 units**
The principles of radiographic cephalometry and the evolution of the technique to its present maturity. The major systems of analysis: the Downs, Riedel, Steiner, and Tweed analyses. The application of radiographic cephalometry to clinical and anthropometric research. Lecture-laboratory.
Gauntt.

ORDN 533 **Concepts of Physical Anthropology** — **2 units**
Basic and classic concepts of physical anthropology as they relate to orthodontics.

ORDN 535 **Advanced Cephalometrics** — **2 units**
Gauntt.

ORDN 541 **Growth and Development** — **2 units**
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.
Walters.

ORDN 543 **Fundamentals of Occlusion** — **2 units**
The development of the human face and dentition. A concept of dynamic functioning occlusion.
Chase.

ORDN 544 **Mixed Dentition in Health and Disease** — **1 unit**
Concepts presented in anatomy and in ORDN 531 and 543 applied to the clinical problems presented by the patient in the transitional period between primary and permanent dentitions. Diagnosis and treatment planning of orthodontic problems in this critical period of human development.
Chase.

ORDN 547 **Human Genetics** — **2 units**
Centerwall.

ORDN 551 **Physiology and Pathology of Speech** — **2 units**
A seminar course in which the literature pertaining to tongue-thrust swallowing and related problems is considered. Problems and treatment discussed by speech therapists.
Staff.

ORDN 571 **Diagnosis and Treatment Planning** — **2 units**
Fundamental aspects of diagnosis and treatment planning of the conventional and the bizarre malocclusions.
Jacobs.

ORDN 579 **Surgical Orthodontics** **1 unit**

Diagnosis and evaluation of potential patients in surgical orthodontics; treatment planning and coordination of treatment.
Gauntt.

ORDN 591 **Current Orthodontics Literature** **1 unit**

Presentation of current papers in various disciplines of orthodontics.
Walters.

ORDN 601 **Seminar in Orthodontics** **1, 1 units**

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. First-year seminar.
Morgan, Asahino.

ORDN 605 **Advanced Seminar in Orthodontics** **1, 1, 1, 1 units**

Second-year seminar.
Morgan, Asahino.

ORDN 625 **Clinical Practice in Orthodontics** **1400 clock hours**

Diagnosis and treatment of 25 assigned patients; minimum of 4 patients with major dental-facial handicaps.
Staff.

ORDN 631 **Orthodontics Clinical Conference** **1, 1, 1, 1 units**

Preparation and presentation of the diagnosis, case analysis, and treatment plans for patients under care.
Simms.

ORDN 651 **Practice Teaching in Orthodontics** **1 unit**

Walters.

ORDN 691 **Research** **arranged**

ORDN 693 **Thesis** **arranged**

Periodontics

PERI 521 **Periodontal Therapy** **2, 2, 2, 2 units**

Seminars in all aspects of examination, diagnosis, and current therapy.

PERI 531, 532 **Periodontal Histopathology** **2, 2 units**

Seminars and laboratory designed to provide detailed knowledge of the development and cellular structure of the periodontal tissues. Emphasis on histopathology and wound healing.

PERI 541 **Minor Tooth Movement** **2 units**

Biologic and mechanical principles of tooth movement as applied in the treatment of periodontal problems.

PERI 561 **Occlusion in Periodontics** **2 units**

Lectures on the role of occlusion in periodontics; clinical experience in the diagnosis and treatment of occlusal disharmonies.

PERI 601 **Seminar in Periodontics** **2, 2, 2, 2 units**

Study of current periodontics literature and literature reviews on selected topics. Guest speakers.

PERI 625 **Clinical Practice in Periodontics** **900-1100 clock hours**

Experience in the clinical diagnosis and treatment of periodontal disease.

PERI 631 **Clinical Conference in Periodontics** **2, 2, 2, 2 units**

A weekly case management conference designed to assist the student in diagnosis, treatment planning, and the management of patients.

PERI 641 Hospital Periodontics — arranged

PERI 642 Special Topics in Periodontics — arranged

PERI 651 Practice Teaching in Periodontics — 1 unit
Closely supervised experience in teaching the undergraduate dentistry student.

PERI 691 Research — arranged
An investigative program (may be in one of the basic sciences or may have clinical application) carried out by the candidate under the direction of a staff member.

PERI 693 Thesis — arranged

Pharmacology

PHRM 531 Topics in Pharmacology for Dentistry — 2 units
Lectures and discussions dealing with pharmacologic agents used in dentistry; emphasis on the current agents used in dental anesthesia, both local and general.

ENGLISH

Faculty

DELMER I. DAVIS, PH.D. University of Colorado 1968
Chairman. Associate Professor of English
American literature

VICTOR S. GRIFFITHS, PH.D. University of Nebraska 1970
Professor of English
Nineteenth century literature, biblical literature, linguistics

RICHARD B. LEWIS, PH.D. Stanford University 1949
Professor of English
Renaissance literature, world literature

HELEN F. LITTLE, M.A. University of Nebraska 1938
Professor of English
Nineteenth century literature

THOMAS A. LITTLE, PH.D. University of Nebraska 1950
Emeritus Professor of English
Renaissance, Old and Middle English, American literature

LAWRENCE E. MOBLEY, PH.D. Michigan State University 1961
Professor of English
American literature

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

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

Lecturers

DAVID L. EVANS, M.A. Loma Linda University 1972
Lecturer in English
Composition and rhetoric; linguistics

MARILYN C. TEELE, M.ED. Boston University 1961
Lecturer in English
English education

The purposes of the graduate program in English are to increase the student's resources and equipment for teaching, writing, and exploration in the areas of his specialty, to help him perfect research skills, and to expand his interests and information in the literature and culture of western civilization.

The applicant should hold a baccalaureate degree with a major (or the equivalent) in English from an accredited college.

The student's undergraduate records, appropriate entrance examinations, and other test scores, are considered by the guidance committee in planning the overall graduate program and determining whether additional undergraduate work is re-

quired to strengthen the student's preparation. The guidance committee helps the student plan his program in such a way that the combined undergraduate and graduate work will have covered the major areas in English and American literature.

Degree requirements

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

1. A minimum of 3 quarters in residence as a graduate student.

2. Competence in French, German, or Latin (or another language approved by the student's guidance committee).

3. A minimum of 48 units as follows: (*a*) at least 36 units in English with no less than 24 in English courses restricted to graduate students (including at least one two-term seminar of 5 units); (*b*) additional units in English or in cognate areas related to the student's program as approved by his guidance committee; (*c*) 3 units in religion.

4. Thesis.

5. Comprehensive written and oral examinations.

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.

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

UPPER DIVISION COURSES APPLICABLE TO GRADUATE PROGRAM

ENGL 423	American Literature: Romanticism	4 units
ENGL 424	American Literature: Realism	4 units
ENGL 425	American Literature of the Twentieth Century	4 units
ENGL 431	Literature to 1500	4 units
ENGL 432	The Sixteenth Century	4 units
ENGL 433	The Seventeenth Century	4 units
ENGL 434	The Eighteenth Century	4 units
ENGL 435	The Nineteenth Century to 1832	4 units
ENGL 436	The Nineteenth Century after 1832	4 units
ENGL 437	The Twentieth Century	4 units
ENGL 441	Biblical Literature	4 units
ENGL 451	Shakespeare	4 units
ENGL 453	Milton	4 units

Offered alternate years.

ENGL 455 Chaucer — 4 units
Offered alternate years.

ENGL 461 Literary Criticism: The Major Texts — 4 units

ENGL 481 History of the English Language — 4 units

ENGL 491 English Colloquium — 4 units
For those not taking undergraduate work at this University.

ENGL 499 Independent Study in English — 1-4 units

GRADUATE COURSES

ENGL 501 Methods and Materials of Literary Study — 3 units
Required of all candidates.

ENGL 503 Composition and Rhetorical Theory — 4 units

ENGL 505 Seminar for Graduate Teaching Assistants — 1, 1, 1 units
Applicable as a cognate course; not applicable to 36-unit requirement in English.

ENGL 581 Problems in English Language and Linguistics — 4 units

SEMINARS. The content of graduate seminars 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 611 Seminar in a Literary Genre — 4-5 units

ENGL 621 Seminar in a Major Literary Period — 4-5 units

ENGL 631 Seminar in a Major Author — 4-5 units

ENGL 641 Seminar in Religion and Literature — 4-5 units

ENGL 651 Seminar in a Literary Theme — 4-5 units

ENGL 691 Research and Thesis in English — 4-8 units

HISTORY

Faculty

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

WILFRED J. AIREY, PH.D. University of Washington 1945
Professor of History
American history

GODFREY T. ANDERSON, PH.D. University of Chicago 1944
Research Professor of American History
American history: colonial and middle periods

ALONZO L. BAKER, PH.D. University of Southern California 1948
Professor of Political Science
International relations

WILLIAM M. LANDEEN, PH.D. University of Michigan 1939
Emeritus Professor of History
Reformation, Renaissance, Middle Ages

WALTER C. MACKETT, PH.D. University of Southern California 1957
Professor of History
History of the British Empire: India

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

GARY M. ROSS, PH.D. Washington State University 1966
Associate Professor of History
American diplomatic relations, history of ideas

PAUL J. LANDA, PH.D. candidate Vanderbilt University 1973
Assistant Professor of Church History
Church history

RONALD L. NUMBERS, PH.D. University of California at Berkeley 1969
Assistant Professor of History
History of science

The principal purposes of the 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 3 quarters in residence as a graduate student.
2. A minimum of 45 quarter units of graduate credit in history (at least 20 units must be in courses numbered above 500; 9 units may be transferred from an approved college or university; 8 units may be in an approved cognate area). Historiography, research methods, and a minimum of two graduate seminars are required.
3. A grade average of B (3.00).
4. Reading proficiency in a modern or classical foreign language.
5. Thesis. Or three papers originally written for graduate seminars, but revised and rewritten to the satisfaction of the student's guidance committee.
6. Satisfactory comprehensive examination on the candidate's field of study.
7. Credit in a graduate religion course.

The student may pursue a course of study emphasizing American, European, or church history.

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.

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

UPPER DIVISION COURSES APPLICABLE TO GRADUATE PROGRAM

HIST 411	Europe 1815-1914	4 units
HIST 412	Europe 1914-1938	4 units
HIST 413	Europe Since 1938	4 units
HIST 417	The French Revolution	4 units
HIST 418	The Napoleonic Era	4 units
HIST 421	History of Russia (to 1917)	4 units
HIST 422	History of Russia (since 1917)	4 units
HIST 433	Historical Studies in Science and Religion	4 units
HIST 435, 436, 437	History of Ideas	4, 4, 4 units
HIST 441	United States Constitution (to 1861)	4 units
HIST 442	United States Constitution (1861 to 1945)	4 units
HIST 443	United States Constitution (since 1945)	4 units

HIST 445	American Diplomatic Relations (1763 to 1865)	4 units
HIST 446	American Diplomatic Relations (1865 to 1939)	4 units
HIST 447	American Diplomatic Relations (since 1939)	4 units
HIST 451	American Colonial History	4 units
HIST 452	Religion in American Life	4 units
HIST 453	Civil War and Reconstruction	4 units
HIST 458	Western America	4 units
HIST 459	California History and Government	4 units
HIST 475	The Early Christian Church	4 units
HIST 477	The Medieval Church	4 units
HIST 479	The Christian Humanists of the Renaissance	4 units
HIST 481	History of the Papacy	4 units
HIST 482	The Lutheran Reformation	4 units
HIST 484	The Swiss Reformation and Calvinism	4 units
HIST 486	The English Reformation	4 units
HIST 487	Twentieth Century Church History	4 units
HIST 495	Readings in History	1-6 units
HIST 499	Projects and Topics in History	1-6 units

GRADUATE COURSES

HIST 501 Research Methods in History — 4 units

HIST 503 Historiography — 4 units

HIST 505 American Historical Literature — 4 units

HIST 543 The Emergence of the American Constitutional System — 4 units
On demand. Anderson.

HIST 545 United States in the Far East Since 1900 — 4 units
On demand. Hoyt.

HIST 561 Concepts of Diplomacy — 4 units
On demand. Ross.

HIST 631 Seminar in European History — 4 units
On demand. Staff.

HIST 635 Seminar in Church History — 4 units
On demand. Staff.

HIST 645 Seminar: The Coming of the Civil War — 4 units
On demand. Anderson.

HIST 647 Seminar in American History — 4 units
On demand. Staff.

HIST 681 Special Problems in History (directed individual study) — arranged
Any term. Staff.

HIST 691 Research and Thesis in History — 4-6 units
Any term. Staff.

MARRIAGE, FAMILY, and CHILD COUNSELING

FRED H. OSBOURN, PH.D. School of Theology at Claremont 1972
Coordinator. Associate Professor of Religion
Marriage counseling practice

HARRISON S. EVANS, M.D. Loma Linda University 1936
Professor of Psychiatry
Psychiatric problems and counseling

CHARLES W. TEEL, B.D. California Baptist Theological Seminary 1959
Professor of Religion; Director, Chaplain's Office, Medical Center
Pastoral counseling

R. RICHARD BANKS, PH.D. University of Notre Dame 1966
Associate Professor of Psychology; Director, University Counseling
Counseling theory and practice

ANEES A. HADDAD, PH.D. University of Southern California 1971
Associate Professor of Sociology
Family sociology, socialization

EDWARD T. HIMENO, M.D. Loma Linda University 1958
Associate Professor of Psychiatry
Child psychiatry, communication

WILLIAM A. LOVELESS, ED.D University of Maryland 1964
Associate Professor of Religion
Marriage counseling in the church

NORMA G. NORRISS, PH.D. Temple University 1963
Associate Clinical Professor of Psychiatry
Child psychology

PETER G. STRUTZ, PH.D. University of Alberta 1966
Associate Professor of Psychology
Counseling theory and practice

CLIFFORD D. ACHORD, PH.D. University of Northern Colorado 1972
Assistant Professor of Psychology
Group counseling

M. JERRY DAVIS, REL.D. School of Theology at Claremont 1967
Assistant Professor of Religion
Pastoral counseling

KAY H. KUZMA, ED.D. University of California at Los Angeles 1970
Assistant Professor of Maternal and Child Health
Child development

Lecturer

ALBERTA S. MAZAT, M.S.W. University of Denver 1970
Lecturer in Psychology
Interviewing and counseling

Marriage, family, and child counseling is an interdisciplinary program offered by the Faculty of Family and Community Studies through the Graduate School in fulfillment of requirements for the Master of Science degree. It is designed to give the student a broad academic background for understanding the family and its problems and to prepare the graduate to assist families in working through their problems. The master's degree enables the graduate to qualify for internship and subsequent state licensure as a counselor; to teach college or adult education courses in marriage and family life; to direct family life programs for church or secular organizations; or to go directly into marriage, family, and child counseling practice in areas where the state license is not yet required.

Marriage, family, and child counseling has been established in California by law as a profession requiring state licensure. After September 1, 1975, persons who desire to enter the profession must have the proper academic and clinical preparation and pass the licensing examination. Others previously practicing as marriage, family, and child counselors must update their credentials by approved continuing education programs. Other states than California have enacted or plan similar legislation. The master's program at this University meets licensing standards.

In addition to preparing registrants for the master's degree, the program provides coursework and clinical training for those who do some marriage or family counseling as part of their jobs (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.

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 and providing character and academic references, the prospective student should also arrange for a personal interview with one of the program coordinators.

Although no particular undergraduate major is specified as preparation for the marriage, family, and child counseling program, competence in certain areas is required: human growth and development, introduction to personality, interviewing and counseling, psychological testing, abnormal psychology, introductory statistics, and marriage and family. Applicants who lack a significant amount of this preparation may be admitted provisionally while making up the prerequisites. Possible ways of meeting deficiencies are arranged individually.

Because of the sequence of courses, the fall quarter is the most efficient time to enter the program, but entrance at other quarters is possible. Students may enroll on a part-time basis with the consent of the coordinator.

Unclassified status

Persons in the helping professions, particularly pastors desiring to improve their counseling skills without proceeding toward a degree, may arrange to take relevant courses and a limited amount of supervised counseling. Before applying for clinical supervision or for unclassified status, they should discuss their needs with the clinical coordinator.

Degree requirements

Requirements for the Master of Science degree include the following:

1. Residence of at least one academic year.

2. A minimum of 48 quarter units of graduate work distributed as follows: (*a*) Core coursework (as itemized below). (*b*) Religion (marriage, religion, and the family, RELP 461), 4 units. (*c*) Electives (from anthropology, consumer related sciences, education, health administration, psychology, psychiatry, religion, or sociology) chosen in consultation with the adviser.

3. Practicum in marriage, family, and child counseling (minimum of 500 hours), inclusive of field experience (approximately 125 hours, MFAM 521) and clinical internship (approximately 375 hours, MFAM 531).

4. Maintenance of a B average (3.00) in the program and compliance with academic regulations prescribed by the Graduate School.

5. Successful completion of written comprehensive examination (taken before advancement to candidacy) and an oral examination (taken at the end of the program).

Core coursework:

MFAM	511	Family Law and Ethics, 2
MFAM	551	Marriage Counseling Theory and Practice, 4
MFAM	567	Sexual Behavior: Normal and Abnormal, 2
MFAM	573	Symbolic Interpersonal Behavior, 4
MFAM	671	Marriage and Family Life, 2-3
PSCH	561	Counseling Theories and Techniques, 4
PSCH	563	Group Process Theory and Procedures, 4
PSYC	621	Seminar: Social Psychiatry, 2
SOCI	501	Research Methods and Methodology, 2-4
SOCI	611	Seminar: The Family, 4, *or*

Clinical program

The state of California requires 1,500 hours of supervised clinical practice over a minimum of two years for licensure in marriage, family, and child counseling. Of the total, 500 hours are included in the master's program (part as field experience and observation and part as clinical practice). Students planning to obtain the California license after conferral of the degree should arrange for an internship of at least 1,000 hours of supervised counseling. To do this under the direction of the Faculty, the student should apply for admission to the clinical program on an application form available at the coordinator's office. The fee charged for the internship is based on the number of hours per week arranged for the intern to counsel. As the intern acquires competence, he shares in the fee paid by the client.

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. An internship may be started at any time, although the beginning of the quarter is preferred.

Clinical services

The Marriage Counseling Service is directed by the Faculty of Family and Community Studies to provide community service to 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 and San Bernardino areas.

MFAM 511 Family Law and Ethics **2 units**

Study of 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, and ethical relations with other professions.

MFAM 515 Crisis Intervention Theory and Techniques **4 units**

Lectures and discussion; laboratory experience in crisis intervention counseling (in connection with the "hot line" emergency service provided jointly by the MFAM faculty and the University counseling service). Open to graduate students, qualified upper division students, faculty members, and community members of all ages interested in serving persons in trouble.

MFAM 521 Field Experience

Planned observation of marriage, family, and child counseling situations; introduction to clinical practice. Registration continuous until completion of the 125 clock hours required.

MFAM 531 Clinical Internship

Supervised clinical counseling of individuals, couples, families, and children. At least 1 hour of supervision for each 5 hours of counseling the student does. Continuous registration for this portion of the internship until completion of the 375 clock hours required.

MFAM 532 Advanced Clinical Internship

Supervised counseling experience (for persons who have completed the degree requirements for state licensure). At least 1 hour of supervision for each 5 hours of counseling the intern does.

MFAM 551 Marriage Counseling Theory and Practice **4 units**

Methods of crisis, couple, and conjoint family counseling; premarital and marital growth groups; short-term therapeutic intervention.

MFAM 556 Diagnostic Procedures **2 units**

Recognition of psychopathology. Sources of help for clients with psychopathology or other pathological symptoms. Methods of dealing with such clients, including techniques of referral.

MFAM 567 Sexual Behavior: Normal and Abnormal **2 units**

Study of sexuality in contemporary society from the sociopsychological viewpoint. Anatomy and physiology of human sexuality: reproduction, normal and abnormal sexual response, psychosexual development, and human fertility.

MFAM 573 Symbolic Interpersonal Behavior **4 units**

Styles of communication within the family unit (verbal and nonverbal); sources of communication pathology; methods of reestablishment of communication.

MFAM 671 Seminar: Marriage and Family Life **1 unit**

Problems and case studies in family life. Examination of research. Consideration of the relation between marriage counseling and other professions. May be repeated for credit.

MFAM 675 Directed Study: Marriage and Family **2-6 units**

Individual study in areas of special interest concerning the family and its problems. May be repeated for credit.

MFAM 681 Research Problem: Marriage and Family **2-6 units**

Directed research in the student's special field of interest in the family. (IP designation given if the research project requires more than one quarter for completion.)

Prerequisite: SOCI 501; or concurrent registration with the consent of the coordinator.

PSCH 561 **Counseling Theories and Techniques** **4 units**

Interviewing; social case work; parent counseling; case study methods. Directive, nondirective, and other methods.

PSCH 563 **Group Process Theory and Procedure** **4 units**

Group guidance; theories of group-individual interaction; communication processes; development and structure of organized groups.

PSYC 621 **Seminar: Social Psychiatry** **2 units**

Examination of the family and the community as the milieu of the individual and the building block of society, both from the scientific viewpoint and from that of the medical practitioner.

SOCI 501 **Research Methods and Methodology** **2-4 units**

An analysis of current social research methods. Practice in the use of techniques. Consideration of the philosophy of scientific method.

Prerequisite: An introductory course in statistics.

SOCI 611 **Seminar: The Family** **4 units**

Evaluation of current research on the family, especially in the United States. Research project on some aspect of family structure or function.

MATHEMATICAL SCIENCES

Faculty

IVAN R. NEILSEN, PH.D. Stanford University 1952
Director. Professor of Biomathematics
Systems analysis, mathematical modeling

JAMES W. RIGGS, JR., PH.D. Texas A and M University 1958
Professor of Physics
Mathematical physics

JAN W. KUZMA, PH.D. University of Michigan 1963
Professor of Biostatistics
Biomedical and health statistics methods

GEOFFREY T. JONES, PH.D. University of California at Los Angeles 1972
Associate Professor of Mathematics
Algebra, lattice theory, foundations

PAUL Y. YAHIKU, PH.D. University of California at Los Angeles 1967
Associate Professor of Biostatistics
Statistical methodology

GRENITH J. ZIMMERMAN, PH.D. University of Minnesota 1970
Associate Professor of Biostatistics
Probability theory, mathematical statistics

DAVID E. ABBEY, PH.D. University of California at Los Angeles 1972
Assistant Professor of Biostatistics
Survey research sampling methods

HAROLD G. RUTHERFORD, PH.D. University of Oregon 1966
Assistant Professor of Biomathematics
Applied systems analysis, biomathematics

T. JOE WILLEY, PH.D. University of California at Berkeley 1969
Assistant Professor of Physiology
Neurophysiology

C. DUANE ZIMMERMAN, PH.D. University of Minnesota 1969
Assistant Professor of Biomathematics
Numerical analysis

Lecturers

HILMER W. BESEL, M.A. University of Nebraska 1952
Lecturer in Mathematics
Computer programing systems

JERE E. CHRISPENS, M.A. University of California at Los Angeles 1966
Lecturer in Biomathematics
Biomedical computer applications

S. ANDREW YAKUSH, M.A. University of Southern California 1972
Lecturer in Biomathematics
Control theory and biological modeling

Research Associate

DAVID W. WILBUR, PH.D. University of California at Berkeley 1965; M.D. Loma Linda University 1971
Research Associate in Biomathematics
Biophysics, theoretical biology

Degree programs

The Graduate Faculty of Mathematical Sciences offers study programs leading to the Master of Science and the Doctor of Philosophy degrees, with varying proportions of emphasis in mathematics, statistics, computer science, numerical analysis, and relevant physical and life sciences. Master of Science degrees, for example, can be designated:

Mathematical Sciences: Biomathematics
Mathematical Sciences: Biostatistics

Combined programs

The mathematical modeling of living systems is a principal subject of ongoing research by the program faculty, and the student working on a modeling problem may need to do substantial study on the system being modeled. In some cases this study may be advantageously accomplished in connection with work on a professional degree (Doctor of Medicine or Doctor of Dental Surgery). Another possibility is a program leading to a combined professional degree and the Doctor of Philosophy. (See Biomedical Science Programs in the *Programs and Degrees* section of division I of this BULLETIN.)

Prerequisite

The equivalent of a major in one field of science or mathematics is a prerequisite. The student who enters without at least a minor in mathematics may need substantial supplementing of his undergraduate mathematics background (frequently through advanced calculus). Endorsement of the student's knowledge in the life sciences is typically based on his successful performance in a course in physiology taken as part of his graduate program. He may need previous coursework in biology and/or biochemistry to compete successfully in the required physiology course. Each student's program is tailored individually to his requirements in collaboration with an adviser and is subject to approval by the program faculty.

Statistics

The general theory of stochastic processes is fundamental to models that statisticians use in describing a variety of theoretical and empirical phenomena. The availability of the computer permits the use of multivariate statistical models that may aid understanding of the underlying mechanisms or processes of phenomena in many fields of science.

Engineering

Many of the mathematical methods used in simulation and modeling have been developed by engineers for engineering applications. The utility and power of these methods in dealing with living systems is beginning to be appreciated and exploited. An affiliation arrangement provides the student with access to engineering courses (as well as mathematics and other courses) offered by the University of Redlands. The systems engineering courses are of particular relevance. Some advanced undergraduate courses (typically available in the College of Arts and Sciences) may be approved for a given student's program.

Computer science

The inherent complexity of living systems almost certainly demands the use of the computer (digital, analog, or hybrid) for simulation or modeling studies. A substantial portion of the student's effort may be devoted to computer science. The

computer science appropriate to a particular project may include both hardware and software realization of algorithms. Real-time data acquisition may also require engineering as well as programing and mathematical and statistical analysis.

Master's degree

The Master of Science degree requires 36 units of coursework in applied mathematics, of which at least 27 units must be in an area of special emphasis. Competence in at least one programing language, such as Fortran, is required at a level that allows its efficient use as a tool for research. This may substitute for a foreign language in fulfilling the degree requirements, but the beginning language course is not acceptable as part of the 36-unit minimum. A research project and a thesis are required.

Doctor's degree

The Doctor of Philosophy degree is normally based on a master's degree, but equivalent work in applied mathematics or a related area may be approved by the program faculty in certain cases.

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

Biomathematics

BIOM 411, 412 Introduction to Electronic Data Processing **2, 2 units**

An introduction to computers and computer systems for the nontechnical student. Emphasis on defining and examining briefly the various parts of a computer: memory, input/output units, central process, and mass memory. Some simple problems programed in a high-level language; discussion of computer applications. No prerequisite.

BIOM 421 Beginning Fortran Programing **3 units**

An introduction to number systems, computer organization, and symbolic programing. Discussion and use of the basic statements of Fortran: I/O, arithmetic, transfer-of-control, array handling, DO statements. Access to computers that handle either Fortran II or Fortran IV.

Prerequisite: For nonscience majors, consent of the instructor.

BIOM 422 Advanced Fortran Programing **3 units**

Discussion of advanced Fortran topics: Subroutines, I/O, graphics, real-time data acquisition. In-line symbolic coding. Reentrant compilation: Fortran data handling. Program debugging.

Prerequisite: BIOM 421 or consent of the instructor.

BIOM 501, 502, 503 Methods in Analysis **3, 3, 3 units**

A course providing the rudiments of the mathematics needed in applied studies in the biosciences; based on the assumption of a good knowledge of calculus and introducing linear algebra, ordinary and partial differential equations, real and complex analysis, and transform theory.

Prerequisite: Calculus.

BIOM 511, 512, 513 Theory of Programing Modern Digital Computers **3, 3, 3 units**

Number systems. Complement arithmetic. Logical organization of a computer. Basic and advanced machine language programing. Arithmetic operations. Scaling. Introduction to symbolic programing. Logical operations. Bit and character manipulation. Assembly programs. Symbolic assembly programing. Interpretive languages. Simulators. Libraries. Input/output. Fortran and mixed language programing. Boolean algebra and logical circuitry of computers. Logical theory of digital machine arithmetic. Introduction to Algol. List processing. Compilers and their structure. Basic ideas of compiler implementation.

Prerequisite: Calculus.

BIOM 545, 546, 547 Methods in Analysis II **3, 3, 3 units**

Complex analysis, matrix theory, transform theory.
Prerequisite: Advanced calculus.

BIOM 551, 552, 553 Numerical Analysis **3, 3, 3 units**

Finite differences, interpolation, summation of series, numerical integration, Euler-MacLaurin formula and asymptotic expansions. Numerical solutions of systems of algebraic and transcendental equations. Newton's and Graeffe's methods. Approximation of functions and least squares. Approximate solution of ordinary and partial differential equations, Moulton's, Runge's, and relaxation and iteration methods. Calculation of eigenvalues of matrices and differential problems. Rayleigh-Reitz method. Integral equations. Programing of computers.
Prerequisite: BIOM 501, 502, 503 or the equivalent.

BIOM 571, 572, 573 Quantitative Physiology **3, 3, 3 units**

A mechanistic treatment of physiological phenomena based primarily on mathematical modeling.
Prerequisite: Calculus and a general course in physiology.

BIOM 581, 582, 583 Biophysical Systems Analysis **3, 3, 3 units**

Linear systems analysis, continuous and sampled data systems, feedback and servomechanisms, dynamic and steady-state response, stability criteria, technological and biological systems, computer modeling, introduction to nonlinear systems analysis.
Prerequisite: BIOM 501, 502, 503 or the equivalent.

BIOM 587, 588, 589 Topics in Real and Functional Analysis **3, 3, 3 units**

Measures and integration, fundamental convergence theorems, Radon-Nikodym theorem, Fubini's theorem, topologies and topological spaces, function spaces, linear and Banach spaces, Lp spaces, representation of linear functionals.
Prerequisite: Advanced calculus.

Mathematics

MATH 325, 326 Algebraic Structures **4, 4 units**

Groups, quotient groups; rings, unique factorization domain, fields, elements of Galois theory.
Prerequisite: MATH 229 or consent of the instructor.
Staff.

MATH 331 Differential Equations **4 units**

Linear equations of the first order, linear equations with constant coefficients, linear equations with variable coefficients, series solutions, Laplace transforms, existence and uniqueness theorems, some applications.
Prerequisite: MATH 231 or consent of the instructor.

MATH 335 Complex Variables **4 units**

Complex numbers, analytic functions, linear transformation, integration, series, contour integration, conformal mapping, and application.
Prerequisite: MATH 132 or consent of the instructor.

MATH 371 Advanced Computer Programing **4 units**

Techniques for computer solution of mathematical problems; assembler language.
Prerequisite: MATH 271 or consent of the instructor.

MATH 372, 373 Computer and Programing Theory **4, 4 units**

Mathematical description of the logical organization of a digital computer and its components; number systems, Boolean algebra, information representation within and without the computer, compiler theory and practice, metalinguistics, operating systems theory, time-sharing theory.
Prerequisite: MATH 271 or consent of the instructor.

MATH 375 Programing Language Theory **4 units**

Syntax and semantics, graph theory, table construction and use, memory allocation, push-down techniques, and machine-code generators, error detection and diagnostics.
Prerequisite: MATH 372 or consent of the instructor.

MATH 431, 432 Analysis — 4, 4 units

Topology of the real line, metric spaces, uniform continuity, properties of the derivative, theory of Riemann integral, Lebesgue measure and integral, convergence theorems.

Prerequisite: MATH 231 or consent of the instructor.

MATH 471, 472 Numerical Analysis — 4, 4 units

Interpolation and approximation, numerical differentiation and integration, solution of nonlinear equations, error analysis, numerical solutions of differential equations, and systems of equations.

Prerequisite: MATH 231, 271 or consent of the instructor.

MATH 499 Projects and Topics in Mathematics — 1-3 units

Limited to department majors or minors with upper division standing. May be repeated for credit with consent of the instructor.

Mathematical science

MTHS 625 Directed Study — arranged

Open to the advanced student by arrangement.

MTHS 627 Seminar — 1 unit

Presentation and discussion of area of interest; individual research and report.

MTHS 691 Research and Thesis in (Biomathematics, Biostatistics) — arranged

Original investigation conducted under the supervision of a staff member.

MTHS 695 Research and Dissertation in Mathematical Science — arranged

Biostatistics

STAT 401 General Statistics — 3 units

Fundamental procedures in collecting, summarizing, presenting, analyzing, and interpreting data. Measures of central tendency and variation, probability, binomial distribution, normal distribution, sampling, confidence intervals, hypothesis testing, t-test, chi-square, and correlation and regression. Laboratory for practical application of techniques.

Prerequisite: Algebra.

STAT 521 Biostatistics I — 4 units

Fundamental procedures of collecting, tabulating, and presenting data. Measures of central tendency and variation, normal distribution, sampling, t-test, confidence intervals, chi-square, and correlation and regression. Emphasis on statistical inference.

Prerequisite: Algebra.

STAT 522 Biostatistics II — 4 units

Analysis of variance (one-way and k-way classifications), correlation and regression (simple, partial, and multiple), covariance analysis, and orthogonal contrasts. Includes 1 unit of laboratory on data-processing equipment.

Prerequisite: STAT 521.

STAT 523 Biostatistics III — 4 units

Experimental designs, including Latin squares, incomplete block designs, nested designs. Special topics in analysis of variance, including general linear hypothesis, multiple comparisons, and missing data. Includes 1 unit of laboratory on the application of computer programs such as the BMD.

Prerequisite: STAT 522

STAT 531 Demographic Methods — 1 unit

Life tables, standardized rates, adjustment methods, adjustment for census and vital statistics errors, health statistics, and population projections.

STAT 535 Introduction to Nonparametric Statistics — 2 units

Sign test, rank-sum test, runs, rank correlation methods, order statistics, Kolmogorov-Smirnow goodness-of-fit tests, k-sample tests, and advanced topics in analysis of contingency tables.

Prerequisite: STAT 521.

STAT 558 Statistical Analysis **2 units**

Use of packaged computer programs such as BMD for performing multivariate and univariate statistical analysis. A minimal amount of theory underlying these analyses.

Prerequisite: STAT 521, 522.

STAT 561 Health Survey Methods **2 units**

Principles and procedures of surveys applicable to public health problems. Survey designs, questionnaire construction, interviewing techniques, sampling techniques, nonresponse problems; data collection, coding, data processing, evaluation, presentation of results. Practical experience by doing a survey project.

Prerequisite: An introductory course in statistics.

STAT 562 Sample Survey Techniques **2 units**

Major sampling techniques: stratification, cluster sampling, multistage sampling, double sampling, systematic sampling; general survey methodology problems. Practical experience gained by designing an actual sample survey. Restricted to students taking biostatistics and epidemiology majors.

Prerequisite: An introductory course in statistics.

STAT 591 Probability **3 units**

An introduction to mathematical theory of probability, with application to statistical problems. Probability, independence, random variables, functions of random variables, moment-generating functions, special distributions.

STAT 592 Mathematical Statistics I **3 units**

Introduction to classic large-sample and modern small-sample methods. Nature of statistical methods, theoretical frequency distributions, sampling theory, introduction to decision theory.

STAT 593 Mathematical Statistics II **3 units**

Correlation and regression, testing goodness-of-fit, principles of estimation hypothesis testing, small-sample distributions, sequential analysis.

STAT 595 Introduction to Stochastic Processes **3 units**

Random variables and stochastic processes, conditional expectation, probability-generating functions, limit theorems. Normal processes, Poisson processes, Markov chains, stochastic models for birth and death processes.

Prerequisite: STAT 591, 592.

STAT 601 Seminar in Biostatistics **1 unit**

Presentation and discussion of area of interest; individual research and report.

STAT 611 Statistical Consulting **1-2 units**

Opportunity for advanced students to participate in statistical consultation with senior staff members. Statement-of-the-problem design of the experiment, definition of response variables, appropriate analysis of data, statistical inferences, and interpretation of the data.

STAT 621 Directed Study **1-2 units**

Open to the advanced student by arrangement.

STAT 691 Research **arranged**

STAT 693 Thesis in Biostatistics **arranged**

MEDICAL TECHNOLOGY

Faculty

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

WILLIAM P. THOMPSON, M.D. University of Michigan 1954
Coordinator. Associate Professor of Pathology
Laboratory medicine, management

BRIAN S. BULL, M.D. Loma Linda University 1961
Professor of Pathology
Laboratory medicine, hematology

EDWARD D. WAGNER, PH.D. University of Southern California 1953
Professor of Microbiology
Parasitology

R. BRUCE WILCOX, PH.D. University of Utah 1962
Professor of Biochemistry
Metabolism of steroid hormones, biochemistry of the endocrine system

CHARLES E. WINTER, PH.D. University of Maryland 1947
Professor of Microbiology
Immunology, medical bacteriology

BENJAMIN H. LAU, PH.D. University of Kentucky 1966
Associate Professor of Microbiology
Immunology, medical bacteriology, mycology

HARVEY A. ELDER, M.D. Loma Linda University 1957
Assistant Professor of Medicine
Infectious diseases, hospital environment

RONALD H. HILLOCK, PH.D. University of Alabama 1972
Assistant Professor of Medical Technology
Clinical chemistry

ROBERT E. MONCRIEFF, M.D. Loma Linda University 1967
Assistant Professor of Pathology
Immunohematology

The department offers a graduate program leading to the Master of Science degree. The sequence of study prepares the student to be a technical specialist, with emphasis in one area of laboratory science, and intends to qualify him for leadership positions in education, administration, and advanced technology.

Facilities

The service, research, and education facilities of the University Medical Center, the Departments of Biochemistry and Microbiology of the School of Medicine, and the Department of Medical Technology of the School of Allied Health Professions provide the graduate student with opportunities for research and development.

Admission

A baccalaureate degree in medical technology or in a related laboratory science acceptable to the department is required for admission. The student must either be eligible for certification or be already certified by the Registry of Medical Technologists of the American Society of Clinical Pathologists, or an equivalent certifying or licensing agency acceptable to the department.

Applicants whose undergraduate work was taken more than five years before they begin graduate studies may be asked to demonstrate proficiency by passing a qualifying examination. Subject deficiencies may be made up by (*a*) independent study and reexamination or (*b*) appropriate courses and reexamination.

Advancement to candidacy

Admission to the Graduate School or to full graduate standing does not constitute admission to candidacy for the degree. Admission to candidacy is initiated by a written petition from the student to the Dean, on recommendation of the department chairman. Subject deficiencies in undergraduate studies must be completed and requirements for regular graduate standing met before the student requests advancement to degree candidacy.

At the time the student petitions for candidacy, he must submit his proposed project title, as approved by his major professor. If his 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 Executive Committee. A student must qualify for advancement to candidacy not later than the beginning of the term in which he expects to complete degree requirements.

Thesis

The student is required to select and conduct a research project of appropriate scope and to present the results in a thesis written in a standard format acceptable to the Graduate School. In addition, the subject should be prepared in journal manuscript form suitable for publication. An oral defense of the thesis is required.

Examinations

After submitting the thesis and completing other requirements, the candidate takes a comprehensive written and oral examination dealing with the area of special emphasis chosen. The student may be excused from the oral examination with the consent of the department chairman and the approval of the examining committee.

Licensure and certification

Students may elect to gain sufficient clinical experience in the University Medical Center laboratory in order to qualify for licensure by the California State Department of Public Health (as clinical chemists or as clinical microbiologists) or for certification by the Registry of Medical Technologists (as hematology specialists or bloodbank specialists).

Degree requirements

The following are the requirements for the Master of Science degree:

1. A minimum of 24 quarter units in the chosen area of specialization.
2. A minimum of 8 quarter units in related courses (including laboratory management, general statistics, and allied health practicum) recommended by the major professor.
3. Religion, 3 quarter units.
4. Research and thesis, 8 quarter units.

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.

SUBJECT REQUIREMENTS FOR AREAS OF EMPHASIS

Clinical chemistry	BCHM	511, 512	General Biochemistry	6, 5
	BCHM	522	Metabolism and Regulation	4
	BCHM	523	Molecular Biology	4
	BCHM	531	Techniques of Biochemistry	4
	MTCH	501	Laboratory Management	2
	MTCH	601	Medical Technology Seminar	2
	MTCH	661	Allied Health Practicum	3
	MTCH	691	Research and Thesis	8
	STAT	401	General Statistics	3
	RLGN		Religion	3
			Electives	4
				48

Clinical microbiology	MICR	521, 522	Medical Microbiology	5, 5
	MICR	542	Applied Clinical Microbiology	4
	MICR	544	Advanced Immunology	4
	MICR	581	Diagnostic Medical Parasitology	2
	MICR	591	Medical Mycology	4
	MICR	601	Seminar in Microbiology	1
	MTCH	501	Laboratory Management	2
	MTCH	661	Allied Health Practicum	2
	MTCH	691	Research and Thesis	8
	STAT	401	General Statistics	3
	RLGN		Religion	3
			Electives	5
				48

Immunohematology	MICR	523	Immunology	2
	MICR	544	Advanced Immunology	4
	MTCH	501	Laboratory Management	2
	MTCH	521	Advanced Immunohematology	5
	MTCH	531, 532	Interpretative Clinical Hematology	3, 2
	MTCH	535	Coagulation Problems	4
	MTCH	551	Medical Genetics	3
	MTCH	601	Medical Technology Seminar	2
	MTCH	661	Allied Health Practicum	3
	MTCH	691	Research and Thesis	8
	STAT	401	General Statistics	3
	RLGN		Religion	3
			Electives	4
				48

Hematology	MTCH	501	Laboratory Management	2
	MTCH	521	Advanced Immunohematology	5
	MTCH	531, 532	Interpretative Clinical Hematology	3, 2
	MTCH	535	Coagulation Problems	4
	MTCH	537	Advanced Hematology Instrumentation	2
	MTCH	541, 542	Advanced Morphologic Hematology	3, 3
	MTCH	601	Medical Technology Seminar	2
	MTCH	631	Literature of Hematology	2
	MTCH	661	Allied Health Practicum	3
	MTCH	691	Research and Thesis	8
	STAT	401	General Statistics	3
	RLGN		Religion	3
			Electives	3
				48

COURSES

MTCH 419 General Laboratory Techniques SN **1 unit**
Routine blood and urine testing; microscopic identification of selected infectious agents; other techniques used in ambulatory care settings where laboratory facilities are not available. Theory and practice for specific techniques useful to the nurse-midwife or the pediatrics nurse associate. (Not open to students in the medical technology curriculum.)

MTCH 501 Laboratory Management **2 units**
Management methods applicable to clinical laboratories.

MTCH 521 Advanced Immunohematology **5 units**
Advanced techniques of bloodbanking. Abnormal antibody studies.

MTCH 531, 532 Interpretative Clinical Hematology **3, 2 units**
Aspects of hematology in relation to patient care.

MTCH 535 Coagulation Problems **4 units**
Aspects of bleeding disorders and associated diagnostic laboratory procedures.

MTCH 537 Advanced Hematology Instrumentation **2 units**
Study of instruments used in hematology laboratories. Instrument design.

MTCH 541, 542 Advanced Morphologic Hematology **3, 3 units**
Bone marrow studies and interpretation. Peripheral blood film interpretation in relation to disease.

MTCH 551 Medical Genetics **3 units**

MTCH 601 Medical Technology Seminar **2 units**
Current topics in medical technology and laboratory medicine. Student presentations.

MTCH 631 Literature of Hematology **2 units**
Current literature. Bibliographic research.

MTCH 635 Hematology Seminar **2 units**
Current topics in hematology.

MTCH 661 Allied Health Practicum **3 units**
Techniques in education. Practice teaching.

MTCH 691 Research and Thesis **8 units**
Investigation of appropriate scope conducted under the direction of the major adviser.

Biochemistry	BCHM 511, 512 General Biochemistry A prerequisite to all other courses in biochemistry.	6, 4 units
	BCHM 521 Advanced Biochemistry Physical biochemistry.	4 units
	BCHM 522 Advanced Biochemistry Metabolism and regulation.	4 units
	BCHM 523 Advanced Biochemistry Molecular biology.	4 units
	BCHM 531 Techniques of Biochemistry	4 units
Biostatistics	STAT 401 General Statistics	3 units
Microbiology	MICR 521, 522 Medical Microbiology	5, 5 units
	MICR 523 Immunology, Virology, Bacteriology, Parasitology	arranged
	MICR 542 Applied Clinical Microbiology	4 units
	MICR 544 Advanced Immunology	4 units
	MICR 581 Advanced Medical Parasitology	3 units
	MICR 591 Medical Mycology	4 units
	MICR 601 Seminar in Microbiology	1 unit

MICROBIOLOGY

Faculty

CHARLES E. WINTER, PH.D. University of Maryland 1947
Chairman. Professor of Microbiology
Immunology, medical bacteriology

ROBERT L. NUTTER, PH.D. Iowa State University 1957
Professor of Microbiology
Molecular biophysics, virology

RAYMOND E. RYCKMAN, PH.D. University of California at Berkeley 1960
Professor of Microbiology
Medical entomology, parasitology, biosystematics

EDWARD D. WAGNER, PH.D. University of Southern California 1953
Professor of Microbiology
Parasitology

LEONARD R. BULLAS, PH.D. Montana State University 1963
Associate Professor of Microbiology
Microbial genetics, bacteriology

BENJAMIN H. LAU, PH.D. University of Kentucky 1966
Associate Professor of Microbiology
Immunology, medical bacteriology, mycology

YUK LIN HO, PH.D. Harvard University 1962
Assistant Professor of Microbiology
Molecular biology

Medical microbiology encompasses the broad scope of human host-parasite relationships. This is understood to include a knowledge of bacteria, fungi, spirochetes, rickettsiae, viruses, protozoa and metazoa, arthropod vectors, and the immunologic, physiologic, and biochemical principles which concern each division of the field.

The main objective of the graduate program in microbiology is to prepare teachers, research workers, and administrators in education, research, and health programs either in this country or in other parts of the world.

The minimum science prerequisite for admission to the graduate program is:

One year of general biology
One year of general chemistry
One complete course in organic chemistry
One complete course in general physics

Waiver of any one of these requirements is only on departmental consent before admission to the graduate program.

Master of Science

Advanced study leading to the Master of Science degree is offered for the student having a bachelor's degree, including the minimum course requirements specified for admission to the Graduate School; for the student who has the equivalent of a bachelor's degree and has completed the first year of the professional curriculum in medicine or in dentistry; and for the graduate from medicine or dentistry.

During the time of study, the student acquires a clear understanding of the fundamental principles of microbiology and a familiarity with their application in the laboratory. In addition, provision is made for concentration in a special field of microbiology and the corresponding mastery of its techniques.

Although reading knowledge of a language other than English is not required for the master's degree, it is strongly recommended if there is any desire or intention to proceed to the Doctor of Philosophy degree

Of the 48 quarter units required for the Master of Science degree, the student must complete at least 20 units of graduate coursework in microbiology. A minimum of 9 units of graduate coursework in another area (usually biochemistry, biology, physiology, pharmacology, or biophysics) constitutes a minor. The student must present an acceptable thesis based on at least 9 units of research in microbiology.

Doctor of Philosophy

A student who is completing a master's degree and who wishes to proceed to the Doctor of Philosophy degree applies in writing to the Department of Microbiology.

The student plans his program of courses under the direction of his guidance committee. Usually he completes the coursework (including courses in the major field, the minor field, and, in some cases, in related areas) within the first two years beyond the master's degree. A reading knowledge of two modern languages, other than English, is required. The departmental advisory committee, in approving the selection, gives preference to the languages in which significant publications in the area of concentration are found or a synthetic language pertinent to the area. The examination for the second foreign language should be taken sometime during the second year of the doctoral program.

After passing the written comprehensive examination, the language examinations, and the oral comprehensive examination, the student applies for candidacy for the doctoral degree. During the candidacy period, he spends most of his time in research. On completion of the research and writing, the student defends his dissertion at an oral examination administered by his committee. By graduation time, the student must have completed satisfactorily a minimum of 8 quarter units of graduate biochemistry. It is recommended that a course in differential and integral calculus be included in the undergraduate preparation.

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.

MICR 481 Diagnostic Medical Parasitology **3 units**

Didactic and laboratory study emphasizing morphology and laboratory recognition of medically important protozoan and metazoan parasites of man. Collateral work on life cycles and diagnostic methods and procedures.

Wagner.

MICR 511, 512 Medical Microbiology **5, 5 units**

Fundamental techniques and concepts of microbiology; principles involved in the mechanism of resistance to infection, including those concerned with hypersensitiveness; a systematic study of pathogenic bacteria, spirochetes, actinomycetes, fungi, rickettsiae, viruses, protozoa, and helminths; practical methods of destruction of microorganisms and laboratory control of chemotherapy; important aspects of medical entomology.

MICR 523 Immunology, Virology, Bacteriology, Parasitology **arranged**

A portion of MICR 521, 522; survey of the bacterial-viral diseases of man and the host response.

By consent of the department chairman only.

MICR 531 Microbial Physiology **4 units**

A study of the growth and nutrition of microorganisms; the effect of physical and chemical environment on the bacterial cell and the mechanisms of survival and virulence.

Ho.

MICR 532 Molecular Biology of Microorganisms **4 units**

DNA replication; the genetic coding of information, its transfer from DNA through RNA to protein, and the regulatory mechanisms of expression of genetic functions, with specific emphasis on microorganisms.

Ho.

MICR 541 Advanced Basic Bacteriology **4 units**

A course to bridge the gap between the elementary level and research status of the basic bacteriology in the fields of occurrence, taxonomy, cytology, staining, and physical properties.

Winter.

MICR 542 Applied Clinical Microbiology **4 units**

A course designed for microbiologists and for medical and allied health personnel having a special interest in diagnostic clinical microbiology and infectious diseases. Conferences and special projects assigned.

Lau, Winter.

MICR 544 Advanced Immunology **4 units**

Fundamental biological and chemical aspects of immunity, hypersensitivity, and serology, with particular consideration of the following: mechanisms of native immunity, mechanisms of acquired immunity, mechanisms of hypersensitivity, and serology and antigenic systems.

Winter.

MICR 551 Bacteriophage Genetics **3 units**

Bacteriophages as a genetic system; lysogeny; transduction; use of bacteriophages in analysis of genetic fine structure.

Bullas.

MICR 552 Microbial Genetics **3 units**

Genetic processes of microorganisms, including molds, protozoa, and bacteria. The contribution that the study of microorganisms has made in modern genetics toward the understanding of the nature of the genetic material and the mechanism of its action.

Bullas.

MICR 553 Microbial Genetics Laboratory **2 units**

Laboratory exercises in bacterial and bacteriophage genetics.

Prerequisite: Microbial genetics or bacteriophage genetics.

Bullas.

MICR 561 Bacterial Virology **3 units**

Introduction to both the virulent and the temperate bacteriophages. The dual nature of viruses as inert particles and as active constituents of functional cells. The physical-chemical approach; the cell-physiological concept.

Nutter.

MICR 562 Animal Virology **4 units**

Fundamental aspects of the animal virus-host cell relationship of selected groups of animal viruses. Principles of the study of cell culture and virus serology.

Nutter.

MICR 563 Cell Culture **3 units**

The practical aspects of the growth of animal cells in culture. Experience with both primary cell cultures and established cell lines.

Nutter.

MICR 571 Arthropod Vectors of Infectious Agents **4 units**

Vector potential of insects, ticks, and mites. Importance of ecology and biosystematics to host-parasite relationships.

Ryckman.

MICR 572 Arthropod Vectors Laboratory **1-2 units**

Ryckman.

MICR 575 Field Medical Entomology **3 units**

The ecology and host relationships of medically important arthropods under field conditions. Emphasis on habitat and host recognition and identification of the parasitic forms.

Ryckman.

MICR 581 Advanced Medical Parasitology **3 units**

Clinical aspects of parasitic diseases, with emphasis on routes of infection, symptomatology, treatment, and diagnosis. Laboratory work: recognition, routine diagnostic procedures, and special techniques in current use. A special project required.

Wagner.

MICR 584 Helminthology **4 units**

Important aspects of the parasitic helminths of animals, particularly the vertebrates. Special consideration of taxonomy, morphology, life histories, host-parasite relationships, and special techniques in the preparation of specimens for study.

Wagner.

MICR 591 Medical Mycology **4 units**

A systematic study of those fungi that cause disease in men and animals, with special emphasis on the clinical and diagnostic features of fungus infections and the epidemiology and public health significance of the fungi.

Lau.

MICR 601 Seminar in Microbiology **1 unit**

Required for a major in microbiology.

MICR 621 Special Problems in Microbiology **2-4 units**

Assignments in literature reviews and/or laboratory exercises.

MICR 691 Research **arranged**

MICR 693 Thesis **arranged**

MICR 695 Research and Dissertation **arranged**

MIDDLE EASTERN STUDIES

Faculty

ANEES A. HADDAD, PH.D. University of Southern California 1971
Coordinator. Associate Professor of Sociology
Arabic, the family, race relations

JOHN W. ELICK, PH.D. University of California at Los Angeles 1969
Professor of Anthropology
Cultural anthropology

A. GRAHAM MAXWELL, PH.D. University of Chicago Divinity School 1959
Professor of New Testament
New Testament backgrounds

JACK W. PROVONSHA, M.D. Loma Linda University 1953; PH.D. Claremont Graduate School 1967
Professor of Philosophy of Religion and Christian Ethics
Comparative ethics, comparative religions

KENNETH L. VINE, PH.D. University of Michigan 1965
Professor of Biblical Studies
Archeology, biblical backgrounds

Cooperating Faculty in the Middle East

ALE-CHR. BJERKAN, PH.D. University of Maryland 1970
Professor of Administrative Education, Middle East College

ROBERT C. DARNELL, PH.D. University of Michigan 1970
Professor of Islamics, Middle East College

BALDUR B. PFEIFFER, DR.PHIL. Johannes Gutenberg Universitat 1970
Assistant Professor of History, Middle East College

Lecturers

BEN D. ARSHAT, M.A. Andrews University 1970
History

JABBOUR S. SEMAAN, M.S. Loma Linda University 1962; M.P.H. 1969
Arabic

The Middle Eastern studies program — an interdisciplinary program sponsored by the graduate faculties of the Department of Sociology and Anthropology, the Department of History and Political Science, and the Division of Religion — leads to a Master of Arts degree. It is designed for students in any of these fields and for others (such as ministers, teachers, or missionaries) whose work naturally stimulates interest in the Moslem world.

The program offers opportunities for firsthand study of an area of great importance politically, religiously, culturally, and historically. The Middle East has long been of interest to the Seventh-day Adventist church because of its biblical emphasis and its eschatological concern. Furthermore, continuous crises have made the Middle East a focal point of interest to the whole world. The graduate pro-

gram in Middle Eastern studies is intended to further understanding among peoples of the Middle East and of the United States.

Admission

To work toward the degree with a major in Middle Eastern studies, the student should hold a bachelor's degree or its equivalent from an accredited college or university, with a major in either the social sciences or the humanities. For a degree in sociology, anthropology, religion, or history, with emphasis in Middle Eastern studies, the student should consult this BULLETIN for the admission and course requirements of these departments. In either case, the student's program of study is arranged in consultation with his adviser, consideration being given to the range and quality of undergraduate preparation.

Admission to regular standing in the program assumes a baccalaureate degree with a major in one of the fields indicated in the foregoing paragraph. An applicant with a major other than one of these is ordinarily expected to strengthen his background in one or more of the areas mentioned. This may be done concurrently with the graduate program.

Degree requirements

The following are requirements for the Master of Arts degree:

1. A minimum of 5 quarters as a graduate student, to include at least 2 quarters at the Loma Linda campus and at least 2 quarters in the Middle East.

2. A minimum of 58 quarter units as follows: (*a*) 28 units of Middle Eastern core courses taken in the first two quarters at the University campus; (*b*) 20 additional units of courses in an area of emphasis: anthropology, history, religion, sociology. The specific requirements for these areas of emphasis are:

Anthropology: ANTH 405, 412, 445, 601, 602.
History: HIST 503; the rest chosen in consultation with the chairman of the Department of History.
Religion.
Sociology: SOCI 461, 525, 601, 602, 641.

3. A thesis in the area of specialization, on a subject directly connected with the Middle East (10 units).

4. Comprehensive written and oral examinations.

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.

MEST 351, 352 **Introductory Arabic** **8 units**

Consecutive courses introducing the student to the spoken Arabic language, with an elementary introduction to the written language.

MEST 421 **Peoples of the Middle East** **4 units**

A descriptive and analytical survey of the major societies and culture types of the Eastern Mediterranean and North Africa.

OR: May be taken as ANTH 421 for anthropology credit.

MEST 443 **Religions of the Middle East and the Western World** **4 units**

A survey of the history, beliefs, and practices of the religions of the Middle East and their present extensions in the Western world, with special attention to Islam.

OR: May be taken as RELH 443 for religion credit.

MEST 501 **Social Research Methods and Methodology** **4 units**

An analysis of current social research methods. Practice in the use of techniques. Consideration of the philosophy of scientific method.

Prerequisite: An introductory course in statistics or consent of the instructor.

OR: May be taken as SOCI 501 for sociology credit.

MEST 607 **Seminar: Middle Eastern Cultural History** **4 units**

A survey of the cultural history of the development of civilization in the East.

OR: May be taken as ANTH 607 or SOCI 607 for anthropology or sociology credit.

MEST 617 **Seminar: The Middle East in the Twentieth Century** **4 units**

Contemporary Middle East. A comparison of political systems. Problems of the area in general.

OR: May be taken as ANTH 617 or SOCI 617 for anthropology or sociology credit.

MEST 675 **Directed Reading** **arranged**

MEST 691 **Research and Thesis** **10 units**

AREA OF EMPHASIS

For courses available in the area of emphasis, see the listings under History, Religion, Sociology, and Anthropology.

NURSING

Faculty

L. FRANCES PRIDE, PH.D. University of Maryland 1967
Associate Dean. Director, Graduate Program in Nursing
Professor of Nursing
Research design, curriculum research

MARILYN J. CHRISTIAN, ED.D. University of Southern California 1974
Dean. Professor of Nursing
Administration, higher education

L. LUCILE LEWIS, M.S. Loma Linda University 1958
Professor of Nursing
Medical and surgical nursing

DOROTHY M. MARTIN, PH.D. University of California at Los Angeles 1970
Professor of Nursing
Maintenance physiology, clinical research

RUTH M. WHITE, DR. P.H. University of California at Los Angeles 1973
Professor of Nursing
Community health, nurse midwifery

JEANETTE R. EARNHARDT, M.S. Loma Linda University 1963
Associate Professor of Nursing
Medical and surgical nursing

PATRICIA C. FOSTER, M.S.N. Vanderbilt University 1963
Associate Professor of Nursing
Medical and surgical nursing

GERTRUDE L. HAUSSLER, M.S. Loma Linda University 1960
Associate Professor of Nursing
Clinical service administration

HELEN EMORI KING, PH.D. Boston University 1973 *
Associate Professor of Nursing
Cellular physiology, clinical problems

MARILYN C. KUEFFNER, D.N.S. University of California at San Francisco 1973
Associate Professor of Nursing
Mother and child nursing

INA Y. LONGWAY, M.S. Loma Linda University 1963
Associate Professor of Nursing
Mother and child care, curriculum

BETTY T. LONNSTROM, M.S. University of California at Los Angeles 1957
Associate Professor of Nursing
Mother and child nursing

M. ANABELLE MILLS, M.S. University of Colorado 1956
Associate Professor of Nursing
Medical and surgical nursing

RUTH M. MUNROE, M.A. Columbia University 1952
Associate Professor of Nursing
Associate degree program, student learning

VALRIE I. RUDGE, M.S. Loma Linda University 1959
Associate Professor of Nursing
Baccalaureate degree program, student learning

HERMINIGILDA L. WONG, M.A. University of the Philippines 1969
Associate Professor of Nursing
Medical and surgical nursing

CLARICE W. WOODWARD, M.S. University of California at Los Angeles 1964
Associate Professor of Nursing
Mother and child nursing

RACHEL M. LEE, M.N. University of California at Los Angeles 1970
Assistant Professor of Nursing
Mental health consultation

CHARLEENE W. RIFFEL, M.S. Loma Linda University 1964
Assistant Professor of Nursing
Oncology

ESTHER B. SELLERS, PH.D. candidate University of Michigan 1973
Assistant Professor of Nursing
Psychiatric and mental health nursing

Philosophy

The graduate program in nursing is intended to prepare students for leadership positions in the United States and other countries. The program is based on the philosophy that the components of nursing leadership are (*a*) clinical competence; (*b*) the ability to apply knowledge drawn from the natural sciences, the behavioral sciences, and nursing theory; (*c*) the insight derived from principles and concepts common to the nursing care of all people.

Objectives

The nurse who meets the requirements for the master's degree is expected to be able to:

1. Apply the School's conceptual model in nursing practice to facilitate movement toward wholeness.
2. Demonstrate expertise in a selected clinical nursing field.
3. Utilize principles from the natural and behavioral sciences to support nursing decisions in the delivery of health services for people of different cultures and in different environments.
4. Identify nursing research problems; state and test hypotheses.
5. Demonstrate Christian leadership, using principles of administration, education, or consultation in a chosen functional field.
6. Evaluate the current state of the art, discuss issues pertinent to nursing, and offer constructive approaches for the advancement of the profession.
7. Think analytically, objectively, and judiciously.
8. Formulate a personal philosophy of nursing.

Clinical facilities

The facilities of the University Medical Center and of community hospitals and agencies provide the student with actual situations in which to observe and practice in the field of special interest.

ADMISSION TO THE GRADUATE PROGRAM

Admission

The student who desires admission to the program for the Master of Science degree should have completed the following:

A baccalaureate degree program in nursing (or its equivalent) in a college or university accredited by the National League for Nursing.

A minimum of 24 quarter units in clinical nursing on the upper division level. (The student who lacks upper division nursing should apply a year before expected enrollment in order to be assured of space in the particular clinical courses needed.)

A course in general statistics (3 quarter units).

The student who wishes to prepare for leadership positions in community health nursing must have experience in this field. A special internship program is arranged for those who have not had this experience. The student who plans to prepare for leadership in medical and surgical nursing should have completed an advanced upper division course in physiology.

Tests

The applicant should submit scores on the Graduate Record Examination.

Certificate of attendance

An applicant from a country outside the United States may not be able to present credits fulfilling the requirements for admission. With the consent of the Dean of the Graduate School and the Director of the Graduate Program, such a student may enroll for certain courses and receive a certificate of attendance for satisfactory completion.

ACADEMIC PRACTICES

Program requirements

The program is four quarters in length. Although latitude is given for individual variation, the entire course of study is a unified program planned with the consultation and approval of the student's major adviser. Part-time study is possible. Full-time study is planned to begin with the autumn quarter.

FIELDS: Clinical, functional

The major in nursing includes courses in the selected clinical field, in the selected functional area of nursing leadership, and in nursing research. The following areas of clinical nursing are offered:

Medical and surgical nursing
Mother and child nursing
Community health nursing
Psychiatric and mental health nursing

The following areas of functional nursing leadership are offered:

Teaching in nursing
Administration in nursing
Clinical practice in nursing

To take a program that combines two areas of clinical nursing requires a longer program and additional time, and the student may be required to take an additional course in the natural and the social sciences, depending on the combination of fields selected.

Grades

A minimum grade point average of 3.00 must be maintained in all clinical nursing courses and in all work taken for the degree. No foreign language is required.

RESEARCH: Thesis, nonthesis

The student has the option of completing a thesis or a nonthesis program for the master's degree. The choice of program is based on evaluation of which program better prepares the individual student for a leadership role in nursing. The decision is made in consultation with the student's major adviser.

The student who elects the thesis option completes a minimum of 48 quarter units. Of this total, the nursing major is 31 quarter units, inclusive of 6 units in research and thesis. The student conducts a systematic research study related to nursing and reports the findings in a publishable paper or thesis. A faculty committee of three guides the student in the research and writing project.

The student who elects the nonthesis option completes a minimum of 52 quarter units. Of this total, the nursing major is 31 quarter units, inclusive of 6 units in research and thesis. The additional units of coursework are planned to augment preparation for career goals. The student completes a research project approved by a faculty committee of three.

Examination

A comprehensive written and oral examination is given at the end of the first academic year of full-time study.

Required courses

The following subjects are required of all students:

NRSG 543 *or* 544 Nursing Leadership
NRSG 545 *or* 546 *or* 547 Practicum in Nursing Leadership
NRSG ___ Clinical Nursing (3-quarter sequence)
NRSG 691 Nursing Research Seminar
SOCI 501 Social Research Methods and Methodology

In addition to the foregoing courses, 4 units in the behavioral sciences and 4 units in the natural sciences cognate to the clinical field are required; 3 units in religion are required also.

Information

For explanation of units of credit, class preparation expected, laboratory assignment, and the level indicated by the course number, see the first page of division II of 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

General

EDCI 515 Curriculum Development in Higher Education — **3 units**

Principles of curriculum development: selection, organization, and evaluation of learning experiences; nature, place, and interrelationship of general and specialized education in college.

Meier, Staff.

EPDM 543 Epidemiology and Control of Infectious Diseases — **4 units**

A review of the principal infectious diseases of public health importance in tropical and temperate climates; present status of these diseases; techniques available for their study and control. Diseases caused by microbial agents, including fungi, bacteria, spirochetes, rickettsiae, and viruses. Lectures and laboratory.

Prerequisite: EPDM 402 or the equivalent.

Kissinger.

EPDM 563 Epidemiology of Chronic Diseases — **3 units**

Critical review of the epidemiology of selected chronic diseases such as cardiovascular diseases, chronic respiratory disease, diabetes, cancer, arthritis, and mental disease, with emphasis on the relationship to experimental and clinical research. Application to prevention of disease; components of chronic disease control programs.

Prerequisite: EPDM 402.

Phillips.

HLSC 436 Behavioral Physiology — **3-4 units**

An approach to human behavior from the point of known neural and endocrine mechanisms and their interaction with the external and internal body environment. Stress control, environmental enrichment, appetite control, drug behaviors, cybernetics, motivation, memory, learning, psychosomatic mechanisms, personality, and character achievement.

Baldwin.

PHSL 571 Clinical Cardiopulmonary Physiology — **4 units**

A study in depth of normal and abnormal physiology of the cardiopulmonary system. Modern electronic instrumentation used to study function in man or experimental animals in laboratory sessions. Lecture and seminar sessions planned to increase understanding of cardiac and pulmonary physiology as a basis for nursing management and for promotion of health programs.

Prerequisite: PHSL 401 or the equivalent.

Martin.

PSCH 563 Group Process Theory and Procedures — **3-4 units**

Group guidance; theories of group-individual interaction; communication processes; development and structure of organized groups.

Prerequisite: PSCH 411, 417.

Strutz.

SOCI 501 Social Research Methods and Methodology — **2-4 units**

An analysis of current social research methods. Practice in the use of techniques. Consideration of the philosophy of scientific method.

Prerequisite: An introductory course in statistics.

B. Stirling.

Graduate nursing

NRSG 505 International Aspects of Nursing — **3 units**

Special problems in nursing care, in teaching concepts of health, and in establishing nursing services and educational programs in various cultures. Mission health programs considered. Problem-solving techniques to help indigenous people meet their needs.

White.

NRSG 509 Guided Study in _____ — **2-6 units**

Opportunity for study in a particular area of nursing or nursing education under the direction of an instructor.

Prerequisite: Consent of the staff.

NRSG 511 School Nursing Services and Procedures **4-8 units**

Principles for planning and implementing effective health services and health counseling (including vision and hearing conservation) in elementary grades through college. Supervised field experience up to 180 clock hours. Registration for minimum of 4 units open to the nurse with two years of full-time experience (under nursing supervision) in school nursing or in a health department in which half of the experience was in a school setting. Theory and laboratory.

Prerequisite: State public health nursing certificate, HLED 593, consent of the instructor.

White.

NRSG 543, 544 Nursing Leadership **4, 3 units**

Study, evaluation, and application of principles of learning, administration, management, and motivation for the imaginative implementation of nursing leadership in the delivery of health services by the teacher, manager, or consultant.

Christian, Munroe.

NRSG 545 Practicum in Nursing Leadership: Teaching **4 units**

A course to help the student develop ability to teach nursing in the clinical area of choice. Knowledge and skills related to educational methodology and the specialty area, with emphasis on the nurse-teacher as facilitator of learning. Practice in teaching students in the clinical and classroom settings, with guidance by experienced faculty members.

Prerequisite or concurrent: NRSG 543 or 544 and three quarters of clinical nursing.

NRSG 546 Practicum in Nursing Leadership: Administration **4 units**

Observation and practice in selected levels of administration of nursing service and/or nursing education.

Prerequisite: NRSG 543 or 544 and three quarters of clinical nursing.

NRSG 547 Practicum in Nursing Leadership: Clinical Practice **4 units**

Principles of leadership applied to nursing practice. Development of clinical expertise and observation. Practice in primary health care, teaching, and consultative roles of the clinical specialist.

Prerequisite: NRSG 543 or 544 and three quarters of clinical nursing.

NRSG 551, 552, 553 Medical and Surgical Nursing **6, 5, 4 units**

Nursing care problems of adult medical and surgical patients explored for their contribution to nursing theory. Concepts from other disciplines investigated for their application to nursing. Individualized laboratory experience designed to develop an innovative, investigative approach to nursing practice.

Lewis.

NRSG 561, 562, 563 Mother and Child Nursing **6, 5, 4 units**

Identification of nursing care problems of families in health and illness during childbearing and childrearing. Solutions sought through analysis and application of concepts, theories, and research findings. Laboratory experience designed to develop an innovative, investigative approach to nursing practice.

Prerequisite or concurrent: PHSL 401.

Kueffner.

NRSG 571, 572, 573 Psychiatric and Mental Health Nursing **6, 5, 4 units**

Sequential depth-analysis of psychiatric nursing, with emphasis on clinical nursing theory and practice. Cognitive self-growth, productivity, expertise; current interdiscipline issue-objectives.

Concurrent: PSCH 563, HLSC 436.

Sellers.

NRSG 581, 582, 583 Community Health Nursing **6, 5, 4 units**

Analysis of theory from public health sciences, behavioral sciences, education, and nursing for application to community nursing practice; criteria used for evaluation of health programs. Family therapy, community organization, and health assessment skills developed through field practice. Nursing hypotheses tested in family and community.

Prerequisite or concurrent: EPDM 543 or 563, 564.

White.

NRSG 554 **Systematic Patient Assessment** 3-6 units

Introduction to expanded role in nursing. Theory and practice of physical examination of the adult; introduction to newborn and pediatrics assessment. Organized reporting and recording used in the problem-oriented medical record system. Participation in diagnostic evaluation and management of minor illnesses or maintenance of diagnosed chronic diseases. Emphasis on collaboration with the physician and on accountability for nursing actions.

Prerequisite: Consent of the instructor.

Wong.

NRSG 564 **Survey of Human Development** 2-4 units

Major theories and research dealing with normal physical, intellectual, emotional, and social development throughout the life cycle. Implications for nursing care.

Kueffner.

NRSG 565 **The Child and Illness** 4 units

Nursing care of the critically ill, chronically ill, terminally ill, and handicapped children and their families. Theories and research relating to the effect of illness and hospitalization on the child.

Kueffner.

NRSG 574 **Psychosomatic Nursing** 2-4 units

The essential role that change and adaptation play in the development and course of illness; implications for nursing practice. Exploration of the nature of adaptive responses to change in man, the consequences of such responses, and the nurse's role in modifying reaction patterns.

Foster.

NRSG 575 **Planned Change** 2-4 units

Utilization of theories and concepts pertinent to the process of interpersonal change in various settings and levels. Experiencing application of the collaborative and cooperative problem-solving processes in small-group and large-group situations.

Sellers.

NRSG 576 **Growth of Self** 2-4 units

Application of abstract theories and concepts for intrapersonal and interpersonal growth. Experiential techniques to promote development of trust, self-realization, interdependence, and honestly sensitive communication.

Sellers.

NRSG 584 **Community Health Nursing Internship** 6 units

Provision for nine to twelve months of part-time experience as a staff nurse in a health agency in the southern California area. Open to graduate students who have not had the public health agency work experience. Part-time study of 6-8 units possible during the period of internship.

White.

NRSG 691 **Nursing Research Seminar** 1-3 units

Consideration of specific problems in nursing research; interpretation and application. Formulation of an individual research plan to study a nursing problem.

Prerequisite or concurrent: SOCI 501.

Martin.

NRSG 693 **Research and Thesis in Medical and Surgical Nursing** 6 units

NRSG 694 **Research and Thesis in Mother and Child Nursing** 6 units

NRSG 695 **Research and Thesis in Psychiatric Nursing** 6 units

NRSG 696 **Research and Thesis in Community Health Nursing** 6 units

CERTIFICATE PROGRAMS

The pediatrics nurse associate program and the nurse midwife program prepare the nurse to provide primary and ongoing health care to individuals. Although qualified to assume total care of normal patients, the nurse practitioner remains in close interchange with the physician. These programs are offered in cooperation with the Department of Pediatrics and the Department of Gynecology and Obstetrics of the School of Medicine. (Development of nurse-conducted delivery portion of the nurse midwife program is subject to California state legal clearance.)

Degree credit

Selected credits may be applied toward a master's degree for those students accepted by the Graduate School. Students in the University baccalaureate nursing program may elect to begin preparation for these expanded roles in the senior year.

Clinical facilities

In addition to the clinical facilities open to all postbaccalaureate students in nursing, the facilities of the Los Angeles County/University of Southern California Medical Center are available for use by students preparing for nurse midwifery. Experience in the intrapartal component of the program is at the University of Utah College of Nursing, Indian Health Service, Maternal and Child Health Project, Shiprock Service Unit, Shiprock, New Mexico.

Admission

These programs are open to graduates of National League for Nursing accredited baccalaureate nursing programs that included preparation in public health nursing. Current California nursing licensure, or the equivalent, is required. Preference is given to applicants with nursing experience in obstetrics, pediatrics, or community health during the past three years. Above-average grades are required.

Tests

Scores on the California Psychological Inventory (CPI) and the Graduate Record Examination (GRE) are required.

Program length

The pediatrics nurse associate program is two quarters in length, and the nurse-midwifery program is three quarters in length.

Nurse-midwifery

NRSG 471 Nurse-Midwifery I — **6-10 units**

Maternal and infant health supervision. Normal antepartal management, complete family planning services, cancer screening. Introduction to physical and developmental assessment of infants. Practice in patient counseling and in working closely with the physician.

Ohashi.

NRSG 521 Nurse-Midwifery II — **10 units**

Advanced maternal and infant health supervision. Development of skills begun in Nurse-Midwifery I. Recognition and management of common problems and minor complications in the reproductive cycle. Parent education skills practiced in groups. Experience in hospital and community. History of nurse-midwifery.

Prerequisite: NRSG 471.

Ohashi.

NRSG 522 Nurse-Midwifery III — **12 units**

Intrapartal and postpartal management of mother and neonate. Management of normal labor, delivery, and early postpartum period in a hospital nurse-midwifery service. Experience in use of analgesia, anesthesia, and other selected modes of treatment. Recognition of complications and use of emergency measures. Collaboration with the physician in giving support to the childbearing family.

Prerequisite: NRSG 521.

Ohashi.

NRSG 523 Nurse-Midwifery Science — **2 units**

Relevant content of reproductive, endocrine, and neonatal physiology. Fluid and electrolyte balance. Some aspects of embryology and genetics. Behavioral science principles related to mother-child relationships and family life.

Prerequisite: PHSL 401 or the equivalent.

Martin.

Pediatrics

NRSG 476 Pediatrics Nurse Associate I — **6 units**

Child health supervision. Preparation for the nurse clinician functioning in the ambulatory care setting. Physical and developmental assessment skills, parental counseling, and preventive health teaching in newborn nursery, pediatrics units, well-baby clinics in the community.

Reeves.

NRSG 526 Pediatrics Nurse Associate II — **10 units**

Management and care of minor illness and problems. Preparation for the nurse clinician to: (*a*) recognize degrees of illness; (*b*) manage common problems and minor illness in consultation with a physician; and (*c*) seek appropriate medical care for major illness of children and adolescents. Clinical practice in child health conferences, pediatrics outpatient service, and private office settings.

Prerequisite: NRSG 476.

Reeves.

NRSG 528 Pediatrics Nurse Associate Science — **2 units**

Relevant content of pediatrics physiology. Fluid and electrolyte balance; some aspects of embryology, genetics, and biochemistry related to nutrition. Development during fetal life. Physiological and psychosocial development through adolescence.

Prerequisite: PHSL 401 or the equivalent.

Martin.

Cognate

MTCH 419 General Laboratory Techniques SN — **1 unit**

Routine blood and urine testing; microscopic identification of selected infectious agents; other techniques used in ambulatory care settings where laboratory facilities are not available. Theory and practice for specific techniques useful to the nurse-midwife or the pediatrics nurse associate. (Not open to students in the medical technology curriculum.)

NUTRITION

Faculty

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

MERVYN G. HARDINGE, M.D. Loma Linda University 1942; DR.P.H. Harvard University 1952; PH.D. Stanford University 1956
Professor of Preventive Care
Public health nutrition

KATHLEEN K. ZOLBER, PH.D. University of Wisconsin 1968
Professor of Food Administration
Food systems administration

ALBERT SANCHEZ, DR.P.H. University of California at Los Angeles 1968
Associate Professor of Nutrition
Biochemistry of nutrition

JOHN A. SCHARFFENBERG, M.D. Loma Linda University 1948; M.P.H. Harvard University 1956
Associate Professor of Applied Nutrition
Human nutrition

ALLEN STROTHER, PH.D. Texas A and M University 1963
Associate Professor of Pharmacology
Drug metabolism, nutrition

IRMA B. VYHMEISTER, PH.D. University of California at Los Angeles 1974
Associate Professor of Nutrition
Public health and clinical nutrition

JAMES W. BLANKENSHIP, PH.D. University of Wyoming 1969
Assistant Professor of Nutrition
Lipids, biochemistry, and nutrition

MARILYN L. JOHNSON, M.S. Loma Linda University 1970
Assistant Professor of Nutrition
Therapeutic nutrition

Programs

The Department of Nutrition offers three programs:

1. A coordinated undergraduate program in dietetics, leading to the Bachelor of Science degree, is offered through the School of Allied Health Professions. The specifics of this program appear in the BULLETIN of that School.

2. A professional program for the Master of Public Health degree is offered through the School of Health and is outlined in the BULLETIN of that School.

3. A program for the Master of Science degree (with majors in three areas available) is offered through the Graduate School, as outlined below.

4. A combined program enabling the student to qualify for the Master of Science and the Master of Public Health degrees concurrently has the advantages of

providing the graduate with (*a*) preparation to be a health-oriented teacher or researcher, or a public health nutritionist; (*b*) two degrees earned at a saving of time and cost. The specifics of this program are outlined in the following pages.

Objectives

The offerings of the department are directed toward objectives that —

1. Provide the student with an understanding of nutritional concepts for guidance in his efforts to improve the nutritional status of the individual and the community.
2. Prepare the student to evaluate the diets of individuals and populations and provide sound bases for making recommendations or initiating programs for nutritional improvements.
3. Instruct in the principles of diet therapy and encourage cooperation with the physician and other members of the medical team.
4. Stimulate scientific curiosity and provide opportunities and facilities for research that will contribute to the fundamental knowledge of nutrition, both basic and applied.
5. Initiate habits of continuing self-education that will enhance professional growth.
6. Assist in fulfilling the objectives of the School and the University.

MASTER OF SCIENCE DEGREE

The Department of Nutrition offers three programs through the Graduate School. Majors may be elected from these areas as follows:

Food administration

A student who has a baccalaureate degree with a major in foods and nutrition, or in business management with supporting courses in nutrition, may apply for graduate work in food administration. Preparation of mature students for positions of responsibility and leadership in food systems management, teaching, research, and allied fields is the primary objective of this graduate program.

Nutrition

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, or public health. A minor in biochemistry is desirable with a nutrition major.

Dietetics

The program in dietetics is planned for the registered dietitian interested in preparing for a career in teaching, clinical supervision, or research.

Thesis

The student is required to present a thesis on an approved subject. The title should be filed with the Graduate Council and approved before the student is eligible for admission to candidacy for the degree. At least 8 units of research and thesis are required. A student engaged in research and thesis work must register for such work in order to obtain residence credit toward the degree. He may be permitted to do part of the work on the thesis while on leave of absence if he has already completed the coursework. To secure this privilege the student petitions the Dean, submits an approved outline of the proposed study, and presents evidence that adequate facilities are available to him for study.

A minimum of 21 quarter units of coursework is required for the major or subject of principal emphasis. Courses leading to a major may be chosen from the following lists.

Food administration

For a major in food administration, all of the following courses are required:

BIOM 421 Beginning Fortran Planning
HADM 401 Principles of Administration
PSCH 471 Industrial Psychology
STAT 401 General Statistics
NUTR 571 Administrative Dietetics
NUTR 573 Operations Analysis in Food Systems Management
NUTR 601, 602 Seminar in Nutrition
NUTR 691 Research
NUTR 693 Thesis

Nutrition

For a major in nutrition, the following courses are required:

STAT 401 General Statistics
BCHM 511, 512 General Biochemistry
NUTR 501, 502 Advanced Nutrition
NUTR 503 Proteins
NUTR 505 Lipids
NUTR 541 Medical Dietetics (required for dietitians)
NUTR 542, 543 Therapeutic Nutrition (required for dietitians)
NUTR 591 Research Techniques
NUTR 601, 602, 603 Seminar in Nutrition
NUTR 691 Research
NUTR 693 Thesis

Dietetics

For a major in dietetics, the following courses are required:

STAT 401 General Statistics
NUTR 501, 502 Advanced Nutrition
NUTR 503 Proteins
NUTR 505 Lipids
NUTR 541 Medical Dietetics
NUTR 542 Therapeutic Nutrition
NUTR 571 Administrative Dietetics
NUTR 573 Operations Analysis in Food Systems Management
NUTR 591 Research Techniques (or equivalent)
NUTR 601, 602 Seminar in Nutrition (minimum of 2 units)
NUTR 691 Research
NUTR 693 Thesis
NUTR Other courses listed under *nutrition* and *food administration* may be selected

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.

NUTR 401 **Basic Nutrition** **2 units**

The fundamentals of nutrition; carbohydrates, proteins, fats, vitamins, minerals, and their roles in human metabolism.

Register, Staff.

NUTR 421 **Public Health Nutrition** **3 units**

Applications of nutrition to meet community needs. Principles of menu planning; consideration of food customs and available resources. Educational principles and methods, materials, and resource personnel utilized in community teaching of nutrition.

Prerequisite: NUTR 401 or the equivalent.

Register, Staff.

NUTR 427 **Special Topics in Nutrition** **1 unit**

Church-related nutrition topics.

Scharffenberg.

NUTR 471 **Current Trends in Food Systems** **2 units**

Demonstrations, field trips, lectures, and discussions showing high-quality food preparation and service and new ideas in menu planning and recipes

Zolber.

NUTR 501, 502 **Advanced Nutrition** **2, 2 units**

Advanced study of normal nutrition, from the infant to the aged. Physiological and chemical bases for nutrient needs.

Prerequisite: Biochemistry.

Vyhmeister.

NUTR 503 **Proteins** **4 units**

Basic protein metabolism as it relates to health and disease in man.

Prerequisite: BCHM 511; or consent of the instructor.

Sanchez.

NUTR 504 **Nutrition and Biochemistry of Vitamins** **3 units**

Nutrition, chemistry, and functions of vitamins.

Prerequisite: BCHM 511; or consent of the instructor.

Strother.

NUTR 505 **Lipids** **3 units**

Metabolism and nutrition of lipids as related to health and disease.

Prerequisite: BCHM 511; or consent of the instructor.

Blankenship.

NUTR 521 **Community Nutrition** **3 units**

An applied community nutrition course designed to teach methods and concepts used in community nutrition programs. Weight control and coronary risk programs and cooking schools used to illustrate approaches to nutrition education within a community. One lecture and two laboratories each week.

Prerequisite: NUTR 421.

Vyhmeister.

NUTR 526 **Nutrition Evaluation and Surveys** **3 units**

Methods of obtaining dietary information; principles of nutrition surveys; assessment of nutritional status in public health programs and clinical research. Laboratory in evaluating diets and surveys.

Prerequisite: NUTR 401 or the equivalent.

Scharffenberg, Register.

NUTR 541 **Medical Dietetics** **2 units**

Principles and practices in the functional and sociological aspects of responsibilities of the medical dietitian related to individual patient needs.

Vyhmeister.

NUTR 542, 543 **Therapeutic Nutrition** **2, 1 units**

Basic biochemical and physiological conditions that necessitate dietary modification as a part of therapeutic management of the patient.

Prerequisite: NUTR 541 or consent of the instructor.

Vyhmeister.

NUTR 571 **Administrative Dietetics** **2 units**

Application of current management concepts to the administration of a dietary service for effective utilization of resources.

Zolber.

NUTR 573 **Operations Analysis in Food Systems Management** **2 units**

Identification and evaluation of quantitative methods of management science to optimize decisions about policies and procedures for control of resources.

Prerequisite: NUTR 571.

Zolber.

NUTR 591 **Research Techniques** **3 units**

A survey of the general laboratory techniques used in the analytical work required in nutritional and biochemical research.

Blankenship.

NUTR 601, 602, 603 **Seminar in Nutrition** **1, 1, 1 units**

Presentation and discussion in the area of interest; individual report dealing with recent developments.

Prerequisite: Consent of the instructor.

NUTR 621 **Directed Study** **arranged**

Open by arrangement to the advanced student.

NUTR 641 **Field Project in Public Health Nutrition** **6 units**

Assignment to a school, hospital, official or voluntary agency, or other approved organization for three months of field experience. Selected with reference to the student's need, preparation, and interest. Supervised by the staff and the organization involved.

NUTR 661 **Special Project** **arranged**

Extensive study and written report on a selected problem.

NUTR 691 **Research** **arranged**

NUTR 693 **Thesis** **arranged**

PHARMACOLOGY

Faculty

IAN M. FRASER, PH.D. Cambridge University 1952
Chairman. Professor of Pharmacology
Drug metabolism, chemotherapy

DONALD I. PETERSON, M.D. Loma Linda University 1947
Associate Professor of Pharmacology
Neuropharmacology

ALLEN STROTHER, PH.D. Texas A and M University 1963
Associate Professor of Pharmacology
Drug metabolism, nutrition

BERNARD E. TILTON, M.D. Loma Linda University 1948; PH.D. University of California at Los Angeles 1960
Associate Professor of Pharmacology
Autonomic pharmacology, clinical pharmacology

C. RAYMOND CRESS, PH.D. Oregon State University 1970
Assistant Professor of Pharmacology
Toxicology

MARVIN A. PETERS, PH.D. University of Iowa 1969
Assistant Professor of Pharmacology
Drug metabolism, biochemical pharmacology

Lecturer

MERVYN G. HARDINGE, M.D. Loma Linda University 1942; DR.P.H. Harvard University 1952; PH.D. Stanford University 1956
Lecturer in Pharmacology
Neuropharmacology, cancer chemotherapy

Programs

Qualified students may be admitted to programs leading to the Master of Science degree, the Doctor of Philosophy degree, or concurrent programs for the D.D.S./M.S. degrees, the M.D./M.S. degrees, the D.D.S./PH.D. degrees, or the M.D./PH.D. degrees. The student 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 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 requirements 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.

Master of Science

The Department of Pharmacology offers two study plans by which the student may satisfy the requirements for the Master of Science degree. A minimum of 48 quarter units is required for the degree. Of this total, 30 units must be in pharmacology. The student may select 18 units of cognate courses in consultation with his departmental adviser. Cognate courses usually include biochemistry and physiology, unless the student has had acceptable work previously in one or both areas, in which case other courses may be selected.

Plan A: A maximum of 12 units of the 30 units of pharmacology may be in research leading to the preparation and successful oral defense of a formal thesis.

Plan B: A maximum of 12 units of the 30 units of pharmacology may be in research; but instead of preparing a formal thesis, the student may elect to present the results of the research to his committee in the form of a publishable scientific paper and take an oral examination broadly related to his field of research.

If the student is planning to continue toward the Doctor of Philosophy degree in pharmacology at this University, he may elect to bypass the master's degree and go directly into the PH.D. program after completing the coursework and research requirements for the M.S. degree. If he desires to continue in such a program, he must make a written request to the department and the Graduate School before the last quarter of study toward the master's degree.

Although a foreign language is not a requirement for the master's degree, students who plan to proceed to a Doctor of Philosophy degree are strongly encouraged to demonstrate, during the course of the master's program, reading ability in at least one of the languages required for the PH.D.

Doctor of Philosophy

A student may be admitted to a program of study toward the Doctor of Philosophy degree with a major in pharmacology after completing the Master of Science degree or its equivalent. A minimum of 72 quarter units beyond the master's degree is required. Of this total, 48 units must be in the major field of study, 28 units of which must be formal coursework. The remainder may be composed of 20 units of research and 24 units of selected cognate courses.

The candidate must take comprehensive written and oral examinations over his major field of study and prepare an acceptable dissertation based on his research program, as stated in section I of this 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.

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.

Pharmacology

PHRM 511, 512 General and Systematic Pharmacology **6, 3 units**

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 531 Topics in Pharmacology for Dentistry **2 units**

Lectures and discussions dealing with pharmacologic agents used in dentistry; emphasis on the current agents used in dental anesthesia, both local and general.
Fraser, Staff.

PHRM 533 Clinical Pharmacology **3 units**

Lectures, discussions, ward rounds, and/or laboratory exercises dealing with therapeutic problems related to common medicinal agents.
Tilton, Staff.

PHRM 541 Topics in Advanced Pharmacology **3 units**

Lectures and discussions dealing with current advanced concepts in pharmacology, such as structure-action relationships, mechanism of action, and metabolism and detoxification of therapeutic agents.
Fraser, Staff.

PHRM 542 Laboratory in Advanced Pharmacology **1-2 units**

Experimental studies illustrating the didactic material presented in PHRM 541.
Fraser, Staff.

PHRM 543 Special Topics in _____ **1-3 units**

Responsibility for a special literature or laboratory project. Registration must designate one of the following specific fields: autonomic pharmacology, biochemical pharmacology, cardiovascular pharmacology, chemotherapy, clinical pharmacology, comparative pharmacology, drug abuse, drug interactions, drug metabolism, endocrine pharmacology, neuropharmacology, pharmacogenetics, psychopharmacology, renal pharmacology, toxicology.
Fraser, Staff.

PHRM 551 Neuropharmacology **4 units**

Systematic discussion of drugs that affect primarily the nervous system, with major emphasis on mechanism of action.
Tilton, Staff.

PHRM 552 Laboratory in Neuropharmacology **1 unit**

Experimental studies illustrating the didactic material presented in PHRM 551.
Tilton, Staff.

PHRM 561 Cardiovascular and Renal Pharmacology **3 units**

Systematic discussion of drugs that affect primarily the cardiovascular and renal systems, with major emphasis on mechanism of action.
Tilton, Staff.

PHRM 562 Laboratory in Cardiovascular and Renal Pharmacology **1 unit**

Experimental studies illustrating the didactic material presented in PHRM 561.
Tilton, Staff.

PHRM 571 Chemotherapy **3 units**

Systematic discussion of drugs that are used primarily in the treatment of infections, with major emphasis on mechanism of action.
Fraser, Staff.

PHRM 572 Laboratory in Chemotherapy **1 unit**

Experimental studies illustrating the didactic material presented in PHRM 571.
Fraser, Staff.

PHRM 581 **Drug Metabolism and Biochemical Pharmacology** 3 units

Detailed discussion of the fate of drugs in the body, together with related aspects of biochemical actions of drugs.

Strother, Staff.

PHRM 582 **Laboratory in Drug Metabolism and Biochemical Pharmacology** 1 unit

Experimental studies illustrating the didactic material presented in PHRM 581.

Strother, Peters.

PHRM 591 **Toxicology** 3 units

Discussion of deleterious effects of drugs and common poisons and measures that can be taken to combat poisoning.

Cress, Staff.

PHRM 601 **Seminar in Pharmacology** 1 unit

Reports and discussions of recent research in pharmacology.

PHRM 681 **Special Problems in Pharmacology** 2-6 units

Assignments in literature reviews and/or laboratory exercises.

PHRM 691 **Research** arranged

PHRM 693 **Thesis** arranged

PHRM 695 **Dissertation** arranged

Biology

BIOL 611 **Research Techniques in Biology** 1 unit

Discussion and demonstration of procedures used in biological research, including scientific writing and literaure.

PHYSIOLOGY

Faculty

KENNETH A. ARENDT, PH.D. Boston University 1955
Cochairman. Professor of Physiology
Cardiovascular physiology, microcirculation

WELDON B. JOLLEY, PH.D. University of Southern California 1959
Professor of Physiology and of Surgery
Cancer and transplant immunology, hemodynamics

JOHN LEONORA, PH.D. University of Wisconsin 1957
Professor of Physiology
Endocrinology

LAWRENCE D. LONGO, M.D. Loma Linda University 1954
Professor of Gynecology/Obstetrics and of Physiology
Placental exchange, fetal physiology

IVAN R. NEILSEN, PH.D. Stanford University 1952
Professor of Biomathematics
Radiation biophysics, mathematical modeling

GORDON G. POWER, M.D. University of Pennsylvania 1961
Associate Professor of Gynecology/Obstetrics and of Physiology
Placental exchange, fetal physiology

RAYMOND G. HALL, JR. PH.D. Loma Linda University 1968
Assistant Professor of Physiology
Cell physiology

ELWOOD S. MCCLUSKEY, PH.D. Stanford University 1959
Assistant Professor of Physiology
Comparative physiology

DONALD D. RAFUSE, PH.D. Washington State University 1973
Assistant Professor of Physiology
Neural aspects of behavior

ROBERT W. TEEL, PH.D. Loma Linda University 1972
Assistant Professor of Physiology
Growth control mechanisms in tumor cells

T. JOE WILLEY, PH.D. University of California at Berkeley 1969
Assistant Professor of Physiology
Neurophysiology

WAYNE E. ZAUGG, PH.D. University of Washington 1965
Assistant Professor of Biophysics
Physical chemistry

Prerequisite

Coursework leading to the Master of Science and the Doctor of Philosophy degrees is offered in physiology. The equivalent of a major in one field of science or mathematics and a minor in another is a prerequisite. Undergraduate courses should include zoology, physical chemistry, and an advanced general physics course

for which calculus is a requirement. The equivalent of at least an undergraduate minor in physics is recommended.

Degree requirements

A minimum of 30 units of coursework in physiology including 511, 512, is required for the master's degree. Course 531, 532 is required for the doctorate. Since several programs are offered, it is expected that each student's program will be suited to his requirements and will be subject to the consent of the program faculty.

Although a foreign language is not a requirement for the master's degree, students who plan to proceed to a Doctor of Philosophy degree are strongly encouraged to demonstrate, during the course of the master's program, reading ability in at least one of the languages required for the PH.D.

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

PHSL 401 Physiology — **4 units**

PHSL 511, 512 Physiology — **6, 6 units**
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.

PHSL 521, 522 Lectures in Physiology — **5, 5 units**
Lectures from PHSL 511, 512.

PHSL 523 Readings in Physiology and Biophysics — **arranged**
Assigned reading and conferences on special problems in physiology.

PHSL 531, 532 Cell and Molecular Biology — **4, 4 units**
Life processes fundamental to animal, plant, and microorganism; a graduate-level introduction. Lecture 3 units and laboratory 1 unit each term.
Prerequisite: Organic chemistry and one of the following: biochemistry, molecular biology, or cell biology. Physics desirable.
McCluskey, Hall, Chadwick.

PHSL 535 Comparative Physiology — **5 units**
A comparison of the major animal groups, from protozoa to mammals. Lecture 4 units; laboratory 1 unit.
Prerequisite: Zoology (preferably invertebrate); physiology (or biochemistry).
McCluskey.

PHSL 536 Readings in Comparative Physiology — **1 unit**
Critical analysis of selected current or classic papers. Content variable. May be taken more than once for credit.
Prerequisite: A course in physiology.
McCluskey.

PHSL 539 Readings in Circadian Rhythms — **1-2 units**
Analysis of selected recent papers. Designed to lead to careful interpretation of the literature in other fields and to an improvement of the design of one's own research.
McCluskey.

PHSL 551 Properties of the Nervous System — **3 units**
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.
Prerequisite: Consent of the instructor.
Willey.

PHSL 561 Regulation in Normal and Cancer Cells (lecture) **2 units**
The regulatory mechanisms of both normal and cancer cells; emphasis on control of DNA synthesis and cell division.
Hall

PHSL 562 Regulation in Normal and Cancer Cells (laboratory) **2 units**
Introduction to techniques in cell culture, autoradiography, and cell cycle analysis.
Concurrent with or subsequent to PHSL 561.
Hall.

PHSL 571 Clinical Cardiopulmonary Physiology SN **4 units**
A study in depth of normal and abnormal physiology of the cardiopulmonary system. Modern electronic instrumentation used to study function in man or experimental animals in laboratory sessions. Planned to equip the nurse to handle sophisticated problems of the acutely ill patient, with special attention to problems of cardiac and pulmonary problems.
Prerequisite: PHSL 401 or the equivalent.

Courses 581-588 are advanced lecture and conference courses exploring the latest concepts of the respective area. Prerequisite or concurrent: PHSL 511 or the equivalent.

PHSL 581 Circulatory Physiology **2 units**
Arendt.

PHSL 582 Respiratory Physiology **2 units**
Power, Longo.

PHSL 583 Gastrointestinal Physiology **2 units**
Baldwin.

PHSL 584 Readings in Neurophysiology **2 units**
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.
Willey.

PHSL 585 Endocrinology **2 units**
Leonora.

PHSL 587 Physiology of Reproduction **2 units**
Leonora.

PHSL 588 Fetal and Neonatal Physiology **3 units**
A study of the normal and abnormal physiology of the developing fetus and neonata. Emphasis on problems of placental exchange, placental and fetal circulation, blood gases, and papers and current investigative work.
Longo, Power.

PHSL 601 Seminar in Physiology **1 unit**
Literature and research reports on selected topics. Required of all graduate students. Credit optional.

PHSL 621 Special Problems in Physiology **arranged**

PHSL 691 Research **arranged**

PHSL 693 Thesis **arranged**

PHSL 695 Dissertation **arranged**

PSYCHIATRY

Faculty

HARRISON S. EVANS, M.D. Loma Linda University 1936
Chairman. Professor of Psychiatry
Administration, general psychiatry

BENJAMIN KOVITZ, M.D. University of Wisconsin 1938
Clinical Professor of Psychiatry
General psychiatry

BETTY J. STIRLING, PH.D. University of California at Berkeley 1963
Professor of Psychiatry
Sociology, research methods

CLARENCE E. CARNAHAN, JR., M.D. Loma Linda University 1954
Associate Professor of Psychiatry
General psychiatry

RAY B. EVANS, PH.D. University of Southern California 1958
Associate Professor of Psychiatry
Adult psychology

RICHARD G. GRIFFIN, M.D. University of California at San Francisco 1957
Associate Professor of Psychiatry
General psychiatry

RICHARD L. HENDERSON, M.D. Albany Medical College 1961
Associate Clinical Professor of Psychiatry
Supervisor of group therapy

EDWARD T. HIMENO, M.D. Loma Linda University 1958
Associate Professor of Psychiatry
Child psychiatry

NORMA B. NORRISS, PH.D. Temple University 1963
Associate Clinical Professor of Psychiatry
Child psychology

BERNARD E. TILTON, M.D., PH.D. Loma Linda University 1948, University of California at Los Angeles 1960
Associate Professor of Pharmacology

WALTER E. TUBBS, PH.D. Drew University 1969
Associate Clinical Professor of Psychiatry
Neuropsychology

WILLIAM H. BRUNIE, M.D. Loma Linda University 1955
Assistant Clinical Professor of Psychiatry
General psychiatry

JOHN C. STOCKDALE, M.D. Loma Linda University 1958
Assistant Professor of Psychiatry
General psychiatry

T. JOE WILLEY, PH.D. University of California at Berkeley 1969
Assistant Professor of Physiology
Neurological basis of behavior

The purposes of the Master of Science program in psychiatry are (*a*) to give opportunity to residents in psychiatry to earn academic recognition for their coursework and research and (*b*) to enable those who may engage in teaching or government work to give evidence of both academic and clinical achievement. The master's program coordinates and fosters research in the Department of Psychiatry.

Admission

Admission to the master's program is limited to those accepted for the residency program of the department. Qualifications include having a Doctor of Medicine degree, acceptable undergraduate preparation, and a grade average acceptable to the Graduate School (an overall 3.00 grade point average). Although admission to the master's degree program is limited to resident physicians in psychiatry, other graduate students may take certain seminars with the consent of the instructor.

Degree requirements

The master's program runs concurrently with the psychiatry residency program. Arrangements may be made for the resident who desires to take the third year at other than the University Medical Center. Degree requirements are:

1. Residence of three years.
2. Completion of a minimum of 51 graduate units, to include: (*a*) at least 38 units of coursework and seminars in psychiatry; (*b*) a 3-unit graduate course in religion chosen in consultation with the adviser; (*c*) a thesis or publishable paper (usually stemming from a research project begun in PSYC 501, or part of a department research project), 10 units.
3. A minimum grade average of B (3.00), with no subject below C (2.00) on all work for the master's degree (this average to be maintained in formal courses and in research computed separately). A student submitting transfer credits must earn a B average on all work taken at this University.
4. Written and/or oral comprehensive examinations at the end of the second year, before advancement to candidacy.

COURSES

PSYC 501 Research Methods **2 units**
Analysis of current research methods, particularly in applied science areas. Practice in the use of techniques. Consideration of the philosophy of scientific method.

PSYC 601 Psychopathology **2, 2, 2, 2 units**
Various psychiatric syndromes considered from the standpoint of their clinical manifestation, etiology, psychodynamic formulation, and treatment.

PSYC 605 Clinical Approach to the Patient **2, 2, 2, 2 units**
Concepts and techniques the clinician uses in his approach to the patient interviewing techniques, psychological tests, the principles underlying the doctor-patient relationship, the use of the doctor-patient relationship in therapy, transference, countertransference and psychoanalytic concepts, and behavioral concepts in patient care.

PSYC 611 Psychophysiology and Neurophysiology **2 units**
Psychophysiological and neurophysiological dimensions of behavior; the role of neuroanatomical structure and neurophysiological processes in behavior.

PSYC 615 Psychopharmacology **2 units**
The role of chemical transmitters in behavior, to provide a basis for the scientific use of psychotropic drugs in clinical practice.

PSYC 621 **Social Psychiatry** **2 units**

Examination of the family and the community as the milieu of the individual and the building block of society, both from the scientific viewpoint and from that of the medical practitioner.

PSYC 625, 626 **Theories of Personality and Personality Development** **2, 2 units**

Theories about the development of human behavior and personality: learning theory, psychoanalytic theory (Freud and Erikson), and Piaget's cognitive theory.

PSYC 631 **Group Processes and Group Therapy** **2 units**

Current concepts regarding group dynamics and their use in group psychotherapy.

PSYC 671 **Literature Seminar** **8 units**

Current literature in psychiatry; 1 unit per quarter; 2 years required.

PSYC 691 **Thesis or Project** **10 units**

RELIGION

Faculty

A. GRAHAM MAXWELL, PH.D. University of Chicago Divinity School 1959
Chairman. Professor of New Testament
New Testament

WILBER ALEXANDER, PH.D. Michigan State University 1962
Professor of Theology and Clinical Ministry
Clinical ministry

EDWARD HEPPENSTALL, PH.D. University of Southern California 1950
Professor of Theology and Christian Philosophy
Theology and Christian philosophy

PAUL C. HEUBACH, M.A. Andrews University 1944
Emeritus Professor of Applied Theology
Applied theology

JACK W. PROVONSHA, M.D. Loma Linda University 1953; PH.D. Claremont Graduate School 1967
Professor of Philosophy of Religion and Christian Ethics
Christian ethics

CHARLES W. TEEL, B.D. California Baptist Theological Seminary 1959
Professor of Pastoral Care
Clinical pastoral education

WILLIAM A. LOVELESS, ED.D. University of Maryland 1964
Associate Professor of Religion
Urban ministry

FRANK A. MORAN, B.D. Andrews University 1965
Emeritus Associate Professor of Evangelism
Evangelism

FRED H. OSBOURN, PH.D. School of Theology at Claremont 1972
Associate Professor of Applied Theology
Applied theology

DALTON D. BALDWIN, M.TH. Princeton Theological Seminary 1963
Assistant Professor of Christian Theology
Theology

M. JERRY DAVIS, REL.D. School of Theology at Claremont 1967
Assistant Professor of Pastoral Care
Clinical pastoral education

Lecturer

VERN D. CARNER, B.A.REL. Union College 1970
Lecturer in Church History
Religion in America

Combined programs

Programs of study in religion leading to the Master of Arts degree are available to students whose primary registration is in the Schools of Health, Medicine, and Dentistry. A Master of Arts degree in religion earned at this University is accepted by the Schools of Health, Medicine, Dentistry as meeting the basic religion requirements of the respective schools.

A primary purpose of the combined program is to provide the qualified professional student with an opportunity to explore the relationship of religion to the healing arts and to equip himself to lead his patients to total health. This aim is based upon the recognition that man is a whole being and in sickness requires total care and treatment.

MASTER OF ARTS

Admission

The applicant should meet the entrance requirements of the Graduate School. The student with an undergraduate major in religion, or equivalent preparation, may be adequately prepared for graduate study in religion. The background of each student seeking graduate status is reviewed by the Division of Religion and the graduate Admissions Committee. Opportunity is provided for removing deficiencies by taking appropriate courses at the University or by special examination.

Requirements

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

1. A minimum of 3 quarters in residence as a graduate student.
2. A minimum of 48 quarter units of graduate credit (9 units of which may be transferred from an approved college or university).
3. A minimum grade average of B (3.00).
4. Reading proficiency in a foreign language (generally Greek, Latin, French, or German).
5. Completion of a program of courses selected from the four areas of biblical, theological, historical, and professional studies or concentrated in one or two of these areas as approved by the appointed adviser and guidance committee.
6. Research project or thesis (6-9 of the required 48 units).
7. Satisfactory written and oral examination on the candidate's subject courses and thesis.

Clinical pastoral education program

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 a 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 92354.

At present, two-thirds of the students annually enrolled on the Loma Linda campus are beyond the baccalaureate level. Consequently, the majority of the

course offerings in religion are designed for the student on this postbaccalaureate level of maturity and educational experience. Certain of these courses numbered 401 to 499 may be elected by the graduate student in consultation with his adviser. Courses numbered 401 to 499 taken for graduate credit include additional research and tutorial instruction.

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

Biblical Studies

RELB 401, 402, 403 New Testament Greek — **3, 3, 3 units**
An introduction to the language of the New Testament designed to provide a basic working knowledge of New Testament Greek and facility in the use of grammar and lexicon. Readings from the Gospel of John and other selected passages.
On demand. Maxwell.

RELB 411 Introduction to the New Testament — **3 units**
An introduction to the text, canon, translation, and interpretation of the New Testament.
On demand. Maxwell.

RELB 422 Christ and Christian Living — **3 units**
A biblical and experiential investigation of Christian living as it relates to the life and ministry of Christ.
Alexander.

RELB 425 The Healing Ministry of Jesus — **3 units**
The healing aspects of Christ's ministry, his use of miracles, and the implications of his methodology for medical workers in meeting the cultural problems and spiritual needs today.

RELB 441 Biblical Philosophy — **3 units**
The history and meaning of God's communication with men; designed to assist the student in the development of an integrated philosophy of religion and life based on revelation.
Baldwin.

RELB 445, 446, 447 Biblical Theology — **3, 3, 3 units**
A book-by-book study of the Bible with a view to discovering God's revelation of himself and his redemptive plan under the particular circumstances recorded by each biblical writer.
Maxwell.

RELB 451 Inspiration and Revelation — **3 units**
Various views of revelation and inspiration in the light of contemporary issues affecting the problem of scriptural authority, Christian faith, and saving knowledge.
On demand. Baldwin.

RELB 461 Daniel — **3 units**

RELB 463 Revelation — **3 units**

RELB 465, 466, 467 New Testament Exegesis — **3 units**
On demand. Maxwell.

RELB 501 The History of New Testament Translation — **3 units**
On demand. Maxwell.

RELB 565, 566, 567 New Testament Exegesis — **3, 3, 3 units**
Prerequisite: Working knowledge of Greek.
Maxwell.

RELB 601 **Seminar: Problems in Biblical Studies** 3 units
Maxwell.

RELB 605 **Seminar: Problems in New Testament Translation** 3 units
Prerequisite: Working knowledge of Greek.
Maxwell.

RELB 675 **Directed Study** 3-9 units

RELB 691 **Research and Thesis in Religion** 6-9 units

Theological Studies

RELT 408 **Christian Perspective** 3 units
An examination of major Christian teachings in the light of the issues raised by contemporary Christian thought.

RELT 411, 412, 413 **Philosophy of Religion** 3, 3, 3 units
RELIGIOUS EPISTEMOLOGY: An exploration of the means by which we know religious truth. What is truth? How do we know the truth about God? How does God reveal himself?
RELIGIOUS METAPHYSICS: An exploration of the nature of ultimate reality; the meaning of the concept of God as Creator; the relation of God to nature and the implications for the study of science and religion.
THE PROBLEM OF EVIL: An in-depth exploration of the problem of sin and suffering, and its immediate and ultimate solution — at-one-ment. Consideration of the contributions depth psychology has made to this ancient Christian dilemma.
Prerequisite: RELT 411 is prerequisite to 412 and 413.
Provonsha.

RELT 416 **God and Human Suffering** 3 units
The Christian philosophy of sin, suffering, redemption, and healing.
Heubach.

RELT 421 **The Doctrine of God** 3 units
God's actions in creation, revelation, and redemption; their implications for Christian faith.
Baldwin.

RELT 422 **The Doctrine of Man** 3 units
The nature of man, with emphasis on freedom, faith, and salvation; implications for authentic human existence.
Baldwin.

RELT 423 **The Doctrine of the Kingdom** 3 units
The church as a human social institution and its relation to the kingdom of heaven. Designed to provide a basis for the solution of problems confronting the church in such areas as religious liberty, church and state relations, ecumenism, and the role of humanitarian service (such as medical missions and public health) in hastening the second coming of Christ.
Baldwin.

RELT 431 **Faith, Righteousness, and Salvation** 3 units
The meaning and scope of the central biblical doctrine of righteousness and salvation by faith in Jesus Christ.
Maxwell.

RELT 435 **Reconciliation and Forgiveness** 3 units
The meaning and communication of reconciliation and forgiveness as God's answers to the issues and problems in the controversy between good and evil.
Alexander.

RELT 437 **Holy Spirit and Human Spirit** 4 units
The relationships between the Holy Spirit and the human spirit in Christian living and ministry.
Alexander.

RELT 441 **The Doctrine of Christ** 3 units

The person and nature of Jesus Christ.

On demand. Heppenstall.

RELT 443 **The Doctrine of the Atonement** 3 units

The atoning work of Jesus Christ both at the cross and in the heavenly sanctuary.

On demand. Heppenstall.

RELT 451, 452 **Christian Ethics** 3, 3 units

First quarter: An examination of the moral life from the perspective of the Christian norm for behavior, including a survey of various methods, ancient and modern, by which men have answered the questions of right and wrong, and setting forth a method based on the biblical love ethic for dealing with contemporary moral problems.

Second quarter: Application of the methods outlined in RELT 451 to specific moral problems, especially those posed by modern medical technology, such as abortion, prolongation of life, organ transplantation, genetic engineering. Issues raised by changing sex values, racial tensions, and mind-altering drugs and manipulative techniques also considered as demonstrations of the adequacy of the Christian norm for contemporary life.

Prerequisite: RELT 451 is prerequisite to 452.

Provonsha.

RELT 481 **Seminar: The Dynamics of Prayer** 3 units

Osbourn.

RELT 601 **Seminar: Philosophy of Religion and Science** 3 units

The methodology of the empirical and theoretical sciences, with special attention to the explanatory power of a hypothesis and programs for its confirmation or disconfirmation; the structure of scientific systems compared with the structure of systems of religious knowledge.

Provonsha.

RELT 605 **Seminar: Contemporary Theology** 3 units

A major figure in contemporary theology selected by each student for study and presentation to the class.

Baldwin.

RELT 611 **Seminar: Problems in Christian Theology** 3 units

RELT 615 **Seminar: Problems in Philosophy of Religion** 3 units

RELT 621 **Seminar: Problems in Christian Ethics** 3 units

Provonsha.

RELT 675 **Directed Study** 3-9 units

RELT 691 **Research and Thesis in Religion** 6-9 units

Historical Studies

RELH 401, 402, 403 **The History of Christianity** 3, 3, 3 units

Significant issues and events in the history of the Christian church, from the apostolic period through the Reformation; issues and problems illustrative of current religious happenings.

On demand. Carner.

RELH 411, 412, 413 **Religion in America** 3, 3, 3 units

COLONIAL CHURCHES (1650-1800): Anglican (Episcopal), Baptist, Congregational, Lutheran, Presbyterian, Quaker, and Roman Catholic.

EARLY NONCOLONIAL CHURCHES: Methodist, Disciples of Christ (Christian), Reformed, Jewish, Mormon, Christian Science, Jehovah's Witnesses, Unitarian-Universalist.

MORE RECENT CHURCHES: Churches, cults, and ethnic religions such as Worldwide Church of God, Pentecostal and Church of God, Salvation Army.

Carner.

RELH 421 **Roman Catholicism** 3 units

Teachings and practices of the contemporary Roman Catholic church approached through an analysis of issues that have arisen in the struggle for renewal during and after Vatican II.

Baldwin.

RELH 431 **Studies in Seventh-day Adventist History** 3 units

On demand. Carner.

RELH 432 **Pioneers of the Seventh-day Adventist Church** 3 units

On demand. Carner.

RELH 435, 436, 437 **History of Seventh-day Adventist Medical Evangelism** 3, 3, 3 units

NINETEENTH CENTURY: The origin and development of Seventh-day Adventist involvement in health education and the healing arts; the role of John Harvey Kellogg and the Battle Creek Sanitarium.

TWENTIETH CENTURY: The history of Loma Linda University; the significance of the healing arts in the worldwide expansion of the Seventh-day Adventist church.

CONTEMPORARY TIMES: Medical evangelism as it is currently practiced by Seventh-day Adventists. The roles of physicians, nurses, dentists, therapists, technologists, chaplains, and other participants; guest lecturers from some of these professions.

Moran.

RELH 441, 442, 443 **World Religions** 3, 3, 3 units

INTRODUCTION: The meaning of religion and the role it has played in man's attempt to deal with the universe around him. Religion as it appears both in primitive cultures and in some of the more notable ancient civilizations: Egypt, Greece, and Rome. The challenge facing the Christian as he encounters the faith and beliefs of non-Christian peoples.

RELIGIONS OF THE EAST: History, beliefs, and practices of the major religions of Southern Asia and the Far East: Hinduism, Buddhism, Confucianism, and Shinto; certain minor faiths derived from them.

RELIGIONS OF THE MIDDLE EAST AND THE WESTERN WORLD: History, beliefs, and practices of the religions of the Middle East and their present extensions into the Western world. Special attention given to Judaism and Islam.

May be taken as MEST 443 for Middle Eastern Studies credit.

Provonsha.

RELH 601 **Seminar: Problems in the History of Seventh-day Adventist Theology** 3 units

RELH 605 **Seminar: Nineteenth Century Adventist Background** 3 units

Carner.

RELH 675 **Directed Study** 3-9 units

RELH 691 **Research and Thesis in Religion** 6-9 units

Professional Studies

RELP 401, 402, 403 **Personal Evangelism** 3, 3, 3 units

The principles and methods of presenting the gospel to individuals and small groups; participation in Bible studies. Must be taken in sequence.

Moran.

RELP 416 **Religion and the Healing Professions** 3 units

A basic orientation in the relationship of religion and the healing arts; the implications of the nature of man for the healing professions; the concept of religious vocation, or "calling," as it conditions the professional person's self-image and purpose as he serves the practical needs of the community.

Provonsha.

RELP 418, 419, 420 **Religion and Mental Health** 3, 3, 3 units

INTRODUCTION: Interpretation of Scripture on the basis of understanding human experience and the nature of man.

MAN'S PREDICAMENT AND POTENTIAL: Key biblical doctrines related to each such subjects as sin, guilt, grace, faith, conversion; from the viewpoint of the dynamics of human experience. Prerequisite: RELP 418.

SEMINAR. Prerequisite: RELP 418.

Osbourn.

RELP 421 Crisis Counseling **3 units**

Counseling placed in the clinical setting. Student interviewing of patients, written verbatim accounts, viewing of films, and participation in group discussions. Especially for the medical or allied health student. An aid to the student in talking with the patient about current emotional needs.

Teel, Davis.

RELP 431 Ellen G. White and the Ministry of Healing **3 units**

A reading course in Ellen G. White's *Ministry of Healing* and related sources dealing with the healing ministry of Christianity.

Baldwin.

RELP 441, 442 Christian Leadership **3, 3 units**

INTRODUCTION: Organizational structure of the Seventh-day Adventist church; privilege and duties of local church office; opportunities and responsibilities of the professional person.

PRACTICUM: The arts of church leadership and Christian teaching; for the professional person. Prerequisite: RELP 441.

Loveless, Osbourn.

RELP 448 Missionary Orientation and Preparation **3 units**

Purpose and motivation of the Seventh-day Adventist mission program; orientation in ethnic, cultural, political, health, and religious problems encountered by the missionary of today.

Provonsha, Staff.

RELP 451, 452, 453 Spiritual Counseling **3, 3, 3 units**

INTRODUCTION: The philosophy and theology of counseling dynamics.

BASIC TYPES: An exploration of the various approaches to counseling.

MAJOR COUNSELING OPPORTUNITIES: Involvement in reality-practice sessions; opportunity to practice the skills of counseling in specific need situations. Prerequisite: RELP 451 or 452.

Heubach, Osbourn.

RELP 461 Marriage, Religion, and the Family **3 units**

Contemporary family theory in the light of the Bible and the writings of Ellen G. White; the family as the basic unit of the church and as the primary environment for personal and spiritual growth.

Teel, Osbourn.

RELP 471 Death, Grief, and the Healing Ministry **2-3 units**

Facing death; helping others to face death or to adjust to the loss of a loved one.

Teel, Davis.

RELP 473 Clinical Ministry **3 units**

Communication principles and approaches; affecting Christian ministry in the clinical setting.

On demand. Alexander.

RELP 481 Seminar: Marriage Enrichment **3 units**

Family interaction; the development of communication skills for marriage partners. Limited to married couples.

Osbourn.

RELP 521 Clinical Pastoral Education **8-12 units**

A twelve-week course for church pastors and seminary students. Supervised experience with patients, lectures by hospital staff, seminars, conferences, hospital rounds with physicians. Five eight-hour days per week. Limited to six students per quarter. Accepted for credit by the Association for Clinical Pastoral Education, Inc.

Teel, Davis.

Courses 523-538 offered in conjunction with the clinical pastoral education emphasis.

RELP 523-526 Group Process Practicum I-IV **each 3 units**

Supervised participation in group process with the clinical pastoral education peer group; intrapersonal development and interpersonal functioning.

Teel, Davis.

RELP 531 Counseling, Theory, and Practice **3 units**

Evaluation of individual counseling, with emphasis on the application of theory; utilization of written verbatim accounts, recorded sessions, role plays, and psychodrama.

Teel, Davis.

RELP 533 Ministry, Psychiatry, Psychology, and Social Work Colloquium **3 units**

Introduction to support sources and referral services; emphasis on understanding the role of the various disciplines and their utilization by the parish minister.

Teel, Davis.

RELP 535 Introduction to Psychological, Social, and Religious Development **3 units**

A course focusing on the roots of emotional being as illustrated in the therapeutic process. Offered in cooperation with the Department of Psychiatry.

Teel, Davis.

RELP 536 Mental Health Media **1 unit**

Study of personality through the use of films and other media presentations, with discussion and research assignments.

Teel, Davis.

RELP 537 The Church and Family Life **2 units**

The helping person as a contributor to the family process. Assessing the components of compatibility in premarital counseling; creating the climate for family growth; analyzing the dynamics of interaction within the family.

Loveless.

RELP 538 Growth Groups in the Church **1 unit**

Theory and process of group interaction for application in the program of a church fellowship. Offered in cooperation with the staff of the University Church.

Loveless, Teel.

RELP 601 Seminar: Problems in Counseling **3 units**

Heubach, Osbourn, Teel.

RELP 675 Directed Study **4-9 units**

Staff.

RELP 691 Research and Thesis in Religion **6-9 units**

Staff.

SOCIOLOGY and ANTHROPOLOGY

Faculty

JOHN W. ELICK, PH.D. University of California at Los Angeles 1969
Chairman. Professor of Anthropology
Cultural anthropology, South America

BETTY R. STIRLING, PH.D. University of California at Berkeley 1963
Professor of Sociology
Family, population, collective behavior, medical sociology

JAMES H. STIRLING, PH.D. University of California at Los Angeles 1968
Professor of Anthropology
Cultural anthropology, archeology, Middle America

KENNETH L. VINE, PH.D. University of Michigan 1965
Professor of Biblical Studies
Archeology, Middle East

ANEES A. HADDAD, PH.D. University of Southern California 1971
Associate Professor of Sociology
Family, socialization, Middle East

CHARLES W. TEEL, JR., PH.D. Boston University 1972
Assistant Professor of Sociology and Religion
Sociology of religion, ethnic relations, the community

Lecturer

MOLLEURUS COUPERUS, M.D. Loma Linda University 1934
Lecturer in Physical Anthropology
Physical anthropology

The aim of the Department of Sociology and Anthropology is to broaden the student's understanding of the organization and function of society and to develop a perspective from comparison of different cultures. The factors that operate to promote cultural stability and change, the effects of contact between peoples of differing cultures, and the social movements of the modern world scene are best understood against a background of theory and practice. This understanding is an essential part of a liberal education.

The departmental programs are designed for persons who intend to engage in teaching, research, medical arts, mission service, or administration, either in the United States or abroad. The department thus has two objectives: (1) to further the education of those who intend to make some aspect of sociology or anthropology their lifework and (2) to broaden, by cognate offerings, the professional and liberal arts education given in various schools in the University.

The student may emphasize Middle Eastern studies in working toward the master's degree in sociology or anthropology. (See also the MIDDLE EASTERN STUDIES section of this BULLETIN.)

Although a thorough grounding in social theory is vital to grasping basic concepts, field training in the observation and application of these principles is considered an important aspect of the student's preparation.

Master of Arts degree

The student specializes in either sociology or anthropology in preparing for the master's examination, but takes 8 units of coursework in the field not chosen for specialization. The program of studies is arranged in consultation with his adviser, consideration being given to the amount and quality of undergraduate preparation. The prospective student whose undergraduate major is in other than the social sciences is required to take supplementary coursework in preparation for the comprehensive examination.

Professional students

The professional school registrant who desires to enroll in graduate level sociology or anthropology courses must have taken an introductory course in one of these two fields or in social psychology.

Degree requirements

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

1. A minimum of 3 quarters in residence as a graduate student.
2. A minimum of 45 quarter units of graduate credit in sociology, anthropology, and related fields, of which at least 24 units are in graduate-level courses and seminars (numbered 500 and above) in the field of specialization.
3. Religion, 3 quarter units.
4. A minimum grade average of B (3.00).
5. Social theory: (*a*) seminars in theory; (*b*) core literature as specified by the department; (*c*) critiques and/or abstracts as assigned.
6. Research competence: (*a*) introductory statistics (prerequisite to research methods, preferably taken before entering the graduate program); (*b*) graduate level research methods course; (*c*) foreign language, and/or computer language, and/or advanced statistics.
7. Thesis, 10 quarter units.
8. Satisfactory written comprehensive examination in the candidate's field of specialization.

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.

SOCIOLOGY COURSES

UPPER DIVISION COURSES APPLICABLE TO GRADUATE PROGRAM

SOCI 311	**Social Issues**	**4 units**
SOCI 315	**Urban Sociology**	**4 units**
SOCI 361	**The Family**	**4 units**
SOCI 365	**Foundations of Social Thought**	**4 units**
SOCI 461	**Sociology of Religion**	**4 units**

GRADUATE COURSES

SOCI 501 Social Research Methods and Methodology **2-4 units**

An analysis of current social research methods. Practice in the use of techniques. Consideration of the philosophy of scientific method.

May be taken as MEST 501 for Middle Eastern Studies credit.

Prerequisite: An introductory course in statistics.

SOCI 525 Population **2-4 units**

An introduction to demography; analysis of the development and current status of population problems; consideration of current population control programs and their progress.

SOCI 601, 602 Seminar: Social Theory **4, 4 units**

A seminar required of both sociology and anthropology master's degree candidates. Credit for either SOCI 601, 602 or ANTH 601, 602; not both.

SOCI 607 Seminar: Middle Eastern Cultural History **4 units**

A survey of the cultural history of the development of civilization in the East.

May be taken as MEST 607 for Middle Eastern Studies credit.

SOCI 611 Seminar: The Family **4 units**

Evaluation of current research on the family, especially in the United States. Research project on some aspect of family structure or function.

SOCI 615 Seminar: Population **4 units**

Consideration of specific areas of demographic research; analysis of census data, particularly of the United States.

SOCI 617 Seminar: The Middle East in the Twentieth Century **4 units**

Contemporary Middle East. A comparison of political systems. Problems of the area in general.

May be taken as MEST 617 for Middle Eastern Studies credit.

SOCI 625 Seminar: Ethnic Relations **4 units**

Group and individual research into current or historical aspects of minority and dominant group relations.

SOCI 631 Seminar: The Community **4 units**

Study into current research on the community, especially problems of the urban and suburban community.

SOCI 635 Seminar: Collective Behavior **4 units**

An analysis of various manifestations of collective behavior or of major social movements and their effects on society.

SOCI 641 Seminar: Social Psychology **4 units**

Consideration of specific areas of social psychology; evaluation of current research in the field.

SOCI 651 Seminar: Medical Sociology **4 units**

Study of medicine as a social institution. Research into various aspects of the medical community and its relation to the rest of society.

SOCI 675 Directed Reading **arranged**

SOCI 691 Research and Thesis **10 units**

ANTHROPOLOGY COURSES

UPPER DIVISION COURSES APPLICABLE TO GRADUATE PROGRAM

ANTH 301	Biological Anthropology	4 units
ANTH 311	Archeology	4 units
ANTH 312	Language and Culture	4 units
ANTH 405	Cultural Geography	4 units
ANTH 406	Man and Land in Mesoamerica	2 units
ANTH 412	Native Peoples of North America	4 units
ANTH 414	Peoples of Latin America	4 units
ANTH 415	Indian Cultures in Mesoamerica	4 units
ANTH 419	Peoples of Africa	4 units
ANTH 421	Peoples of the Middle East	4 units
ANTH 423	Peoples of Asia	4 units
ANTH 433	Comparative Religion	4 units
ANTH 435	Folklore	4 units
ANTH 445	Sociocultural Change	4 units
ANTH 447	Applied Anthropology	4 units
ANTH 449	Anthropology and Health	4 units

GRADUATE COURSES

ANTH 601, 602 Seminar: Social Theory **4, 4 units**

A seminar required of both sociology and anthropology master's degree candidates. Credit for either ANTH 601, 602 or SOCI 601, 602; not both.

ANTH 607 Seminar: Middle Eastern Cultural History **4 units**

A survey of the cultural history of the development of civilization in the East.
May be taken as MEST 607 for Middle Eastern Studies credit.

ANTH 611 Seminar: Cultural Anthropology **4 units**

Intensive work on particular problems in some aspect of cultural anthropology.

ANTH 617 Seminar: The Middle East in the Twentieth Century **4 units**

Contemporary Middle East. A comparison of political systems. Problems of the area in general.
May be taken as MEST 617 for Middle Eastern Studies credit.

ANTH 621 Seminar: Prehistory **4 units**

Consideration of specific problems in archeological research, interpretation, and historical reconstruction.

ANTH 625 Seminar: Sociocultural Change 4 units

Evaluation of various theories of culture change; individual research in specific culture-change problems.

ANTH 631 Seminar: Physical Anthropology 4 units

Group research in current problems in the study of fossil man, human genetics and evolution, race, etc.

ANTH 633 Seminar: Comparative Religion 4 units

Reading and discussion of current anthropological writing on the role of religion in maintaining the cultural system; research in particular religious systems, mythology, and world view.

ANTH 635 Seminar: Anthropological Linguistics 4 units

The role played by language in perception and cognition; ethnographic research in linguistic domains as indicators of culturally determined cognitive ranges and emphases; structural analysis of a selected language.

ANTH 665 Fieldwork in Ethnography arranged

Individual program of field research in social anthropology, under the supervision of a faculty member acquainted with the society or community chosen for study.

ANTH 667 Fieldwork in Archeology arranged

Field research in archeology, under the supervision of a faculty member, usually in connection with a project sponsored by the department.

ANTH 675 Directed Reading arranged

ANTH 691 Research and Thesis 10 units

III

University Administration
The Graduate School
Alumni Federation
Instructional Resources

THE TRUSTEES

Officers	Chairman	NEAL C. WILSON
	Vice Chairman	CREE SANDEFUR
	Secretary	KENT W. DICKINSON

UNIVERSITY ADMINISTRATION

OFFICERS OF THE UNIVERSITY

President		V. NORSKOV OLSEN, PH.D., DR.THEOL.
Vice President	Academic Affairs	NORMAN J. WOODS, PH.D.
Vice President	Financial Affairs	GEORGE G. O'BRIEN, PH.D.
Vice President	Student Affairs	TRACY R. TEELE, M.ED.
Vice President	Public Relations	———————
Vice President	Foundation Affairs	ROBERT J. RADCLIFFE, C.G.A.
Vice President	Development	DAVID J. BIEBER, ED.D.

THE GRADUATE SCHOOL

J. PAUL STAUFFER, PH.D, Dean

Administrative Committee	J. Paul Stauffer, *Chairman*	George G. O'Brien V. Norskov Olsen	Academic VP
Executive Committee	J. Paul Stauffer, *Chairman* Leonard R. Brand Delmer I. Davis	John W. Elick Frederick G. Hoyt Elmer E. Kelln A. Graham Maxwell	L. Frances Pride R. Bruce Wilcox Kathleen K. Zolber

THE FACULTY AND LECTURERS

In the alphabetical list of teachers, the code letters indicate the section(s) in which the teacher's name is found.

ANAT	Anatomy	MTHS	Mathematical Sciences
BCHM	Biochemistry	MICR	Microbiology
BIOL	Biology	NRSG	Nursing
CMDS	Communicative Disorders	NUTR	Nutrition
DENT	Dentistry	PHRM	Pharmacology
ENGL	English	PHSL	Physiology
HIST	History	PSYC	Psychiatry
MEST	Middle Eastern Studies	RLGN	Religion
MFAM	Marriage, Family, Child	SOCI	Sociology/Anthropology
MTCH	Medical Technology		

Abbey, David E.	MTHS	Asahino, Steve N.	DENT
Achord, Clifford D.	MFAM	Baker, Alonzo L.	HIST
Adams, Donald F.	DENT	Baldwin, Dalton D.	RLGN
Airey, Wilfred J.	HIST	Banks, R. Richard	MFAM
Alexander, Wilber	RLGN	Barnard, Logan W.	DENT, CMDS
Anderson, Godfrey T.	HIST	Beltz, Richard E.	BCHM
Anholm, J. Milford	DENT	Besel, Hilmer W.	MTHS
Arendt, Kenneth A.	BIOL, PHSL	Bjerkan, Ale-Chr.	MEST
Arnett, R. Leslie, Jr.	DENT	Blankenship, James W.	NUTR
Arshat, Ben D.	MEST	Brand, Leonard R.	BIOL

Briggs, Bernard D.	DENT
Britt, E. Evelyn	CMDS
Brooks, Clifton R., Sr.	DENT
Brunie, William H.	PSYC
Bryant, John W.	DENT
Buell, Ronald E.	DENT
Bull, Brian S.	MTCH
Bullas, Leonard R.	BIOL, MICR
Byrd, Bernard C.	DENT
Carnahan, Clarence E., Jr.	PSYC
Carner, Vern D.	RLGN
Case, Norman M.	ANAT, BIOL
Centerwall, Willard R.	DENT
Chadwick, Arthur V.	BIOL
Chambers, Frank W.	DENT
Chase, Alden B.	DENT
Chrispens, Jere E.	MTHS
Christian, Marilyn J.	NRSG
Clark, Elbert W., IV	DENT
Clausen, Conrad D.	BIOL
Cohen, Melvin S.	CMDS
Collins, Edwin M.	DENT
Couperus, Molleurus	SOCI/ANTH
Crane, Earl R.	DENT
Cress, C. Raymond	PHRM
Crigger, Max	DENT
Cummings, Raleigh R.	DENT
Dalgleish, Arthur E.	ANAT, BIOL
Darnell, Robert C.	MEST
Davis, Delmer I.	ENGL
Davis, M. Jerry	MFAM, RLGN
Day, Lawrence D.	DENT
DeVincenzo, John P.	DENT
Dunn, Robert P.	ENGL
Earnhardt, Jeanette R.	NRSG
Elder, Harvey A.	MTCH
Elick, John W.	MEST, SOCI/ANTH
Engen, Paul C.	ANAT
Evans, David L.	ENGL
Evans, Harrison S.	MFAM, PSYC
Evans, Ray B.	PSYC
Evard, Rene	BCHM
Ewert, Arthur A.	DENT
Foster, Patricia C.	NRSG
Fowler, C. Douglas	DENT
Fraser, Ian M.	BIOL, PHRM
Gamboa, George C.	DENT
Gauntt, Lloyd E.	DENT
Graham, Eber R.	DENT
Greenlaw, Ronald W.	CMDS
Griffin, Richard G.	PSYC
Griffiths, Victor S.	ENGL
Gusseck, David J.	BCHM
Haddad, Anees A.	MEST, SOCI, MFAM
Hall, Raymond G.	PHSL
Hardinge, Mervyn G.	NUTR, PHRM
Harrison, Charles W.	ANAT
Hartley, Jack L.	CMDS
Haussler, Gertrude L.	NRSG
Heinrich, Virgil V.	DENT
Henderson, Richard L.	PSYC
Henken, Herbert W.	ANAT
Heppenstall, Edward	RLGN
Herrmann, E. Clifford	BCHM
Heubach, Paul C.	RLGN
Hillock, Ronald H.	MTCH
Himeno, Edward T.	PSYC, MFAM
Ho, Yuk Lin	BIOL, MICR
Howell, Francis V.	DENT
Hoyt, Frederick G.	HIST
Hubbard, Richard W.	MTCH, BCHM
Hunt, Guy M.	ANAT
Jacques, Brian J.	CMDS
Johnson, Marilyn L.	NUTR
Jolley, Weldon B.	PHSL
Jones, Geoffrey T.	MTHS
Jorgensen, Niels B.	DENT
Kelln, Elmer E.	DENT
Kiger, Robert D.	DENT
King, Helen E.	NRSG
Klooster, Judson	DENT
Kloss, James L.	DENT
Kovitz, Benjamin	PSYC
Kueffner, Marilyn C.	NRSG
Kuzma, Jan W.	MTHS, BIOL
Kuzma, Kay H.	MFAM
Landa, Paul J.	HIST
Landeen, William M.	HIST
Lathrop, Earl W.	BIOL
Lau, Benjamin H.	MICR, MTCH
Lee, Rachel M.	NRSG
Leonora, John	PHSL
Lessard, George M.	BCHM
Lewis, L. Lucile	NRSG
Lewis, Richard B.	ENGL
Little, Helen F.	ENGL
Little, Thomas A.	ENGL
Longo, Lawrence D.	PHSL
Longway, Ina Y.	NRSG
Lonnstrom, Betty T.	NRSG
Loveless, William A.	RLGN, MFAM
Lutz, Kenneth R.	CMDS
Mackett, Walter C.	HIST
Martin, Dorothy M.	NRSG
Maxwell, A. Graham	MEST, RLGN
Mazat, Alberta S.	MFAM

McCluskey, Elwood S.	BIOL, PHSL
McMillan, Paul J.	ANAT
Mills, M. Anabelle	NRSG
Mitchell, Norman L.	BIOL
Mobley, Lawrence E.	ENGL
Moncrieff, Robert E.	MTCH
Moran, Frank A.	RLGN
Morgan, Arthur J.	DENT
Mortensen, Raymond A.	BCHM
Munroe, Ruth M.	NRSG
Neilsen, Ivan R.	MTHS, PHSL
Neufeld, Berney R.	BIOL
Nishimura, Karl K.	DENT
Nivison, J. Richard	DENT
Norriss, Norma G.	PSYC, MFAM
Numbers, Ronald L.	HIST
Nutter, Robert L.	BIOL, MICR
Nutting, Edward B.	DENT
Oliver, Richard C.	DENT
Olsen, Lee E.	DENT
Olsen, V. Norskov	HIST
Osbourn, Fred H.	MFAM, RLGN
Peterson, Donald I.	PHRM
Peters, Marvin A.	PHRM
Pfeiffer, Baldur B.	MEST
Power, Gordon G.	PHSL
Pride, L. Frances	NRSG
Provonsha, Jack W.	MEST, RLGN
Rafuse, Donald D.	PHSL
Rappaport, Irving	DENT
Rathbun, W. Eugene	DENT
Register, U. D.	BCHM, NUTR
Riffel, Charleene W.	NRSG
Riggs, James W.	MTHS
Roberts, Walter H. B.	ANAT
Ross, Gary M.	HIST
Roth, Ariel A.	BIOL
Rowley, Rodney R.	CMDS
Rudge, Valrie I.	NRSG
Rutherford, Harold G.	MTHS
Ryckman, Raymond E.	BIOL, MICR
Sanchez, Albert	NUTR
Scharffenberg, John A.	NUTR
Schmidt, Merrill E.	DENT
Schmidt, Richard E.	DENT
Schnepper, Harold E.	DENT
Schultz, Robert L.	ANAT, BIOL
Sellers, Esther B.	NRSG
Semaan, Jabbour S.	MEST
Shryock, Harold	ANAT
Simms, Richard A.	DENT
Slattery, Charles W.	BCHM
Smith, Howard C.	ANAT
Stauffer, J. Paul	ENGL
Steinman, Ralph R.	DENT
Stirling, Betty J.	SOCI, PSYC
Stirling, James H.	SOCI/ANTH
Stockdale, John C.	PSYC
Stokos, James	DENT
Strother, Allen	NUTR, PHRM
Strutz, Peter G.	MFAM
Tarr, W. Fletcher	CMDS
Taylor, Wm. Holmes	ANAT
Teel, Charles W.	RLGN, MFAM
Teel, Charles W., Jr.	SOCI/ANTH
Teel, Robert W.	PHSL
Teele, Marilyn C.	ENGL
Testerman, John K.	BIOL
Thompson, William P.	MTCH
Tilton, Bernard E.	PHRM, PSYC
Tomlinson, John L.	DENT
Tubbs, Walter W.	PSYC
Vine, Kenneth L.	MEST, SOCI/ANTH
Vyhmeister, Irma B.	NUTR
Wagner, Edward D.	MICR, BIOL, MTCH
Walters, Roland D.	ANAT, DENT
White, Ruth M.	NRSG
Widmer, Elmer A.	BIOL
Wilbur, David W.	MTHS
Wilcox, R. Bruce	BCHM, MTCH
Willey, T. Joe	PSYC, MTHS, PHSL
Winter, Charles E.	MICR, BIOL, MTCH
Wong, Herminigilda L.	NRSG
Woodward, Clarice W.	NRSG
Yahiku, Paul Y.	MTHS
Yakush, S. Andrew	MTHS
Young, Daniel R.	DENT
Zaugg, Wayne E.	PHSL
Zimmerman, C. Duane	MTHS
Zimmerman, Grenith J.	MTHS
Zolber, Kathleen K.	NUTR

SUMMARY OF DEGREES CONFERRED

	M.S.	M.A.	PH.D.	TOTAL
1951	4	—	—	4
1952	1	—	—	1
1953	2	—	—	2
1954	—	—	—	—
1955	2	—	—	2
1956	16	—	—	16
1957	11	—	—	11
1958	22	—	1	23
1959	18	—	—	18
1960	19	—	1	20
1961	24	—	1	25
1962	35	—	1	36
1963	43	—	—	43
1964	46	2	—	48
1965	47	1	—	48
1966	41	3	—	44
1967	23	5	2	30
1968	38	10	2	50
1969	40	6	3	49
1970	35	7	2	44
1971	47	8	—	55
1972	43	7	5	55
1973	38	10	4	52
	595	59	22	676

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 Alumni 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.

INSTRUCTIONAL RESOURCES

LIBRARIES

The University has main libraries on the La Sierra and the Loma Linda campuses and in addition has access to libraries in the region. The joint holdings of the University are:

	LA SIERRA	LOMA LINDA	TOTAL
Books and bound periodicals	130,540	163,660	294,200
Current periodical subscriptions	1,000	2,500	3,500

Students and faculty members have full borrowing privileges at both libraries. Immediate information and lending arrangement can be accomplished by telephone. Mail service and personal delivery can be utilized also.

La Sierra campus

The Library of the La Sierra campus has a general liberal arts collection, with concentrations in history, religion, English, and education. The Heritage Room collection is of nineteenth-century Seventh-day Adventist books and pamphlets. In addition to the microfiche Library of American Civilization already purchased, augmentation of microform holdings is in process. The Media Services department of the Library is the control center for audiovisual services for the campus; also the Curriculum Laboratory, cosponsored with the School of Education, is located in the Library.

Loma Linda campus

The Library acquisitions at Loma Linda are in medicine, dentistry, allied health professions, graduate programs, and a liberal arts undergraduate collection in support of certain graduate and professional programs. About half the resources are in medical and related fields, among them some rare materials in the history of medicine. The Human Relations Area Files on microfiche make available at this Library primary source materials on most of the known cultures of the world. Since 1957 designated the official west coast depository for Seventh-day Adventist literature regularly provided by church publishing houses in North America, the Library maintains such publications in the Heritage Room 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.

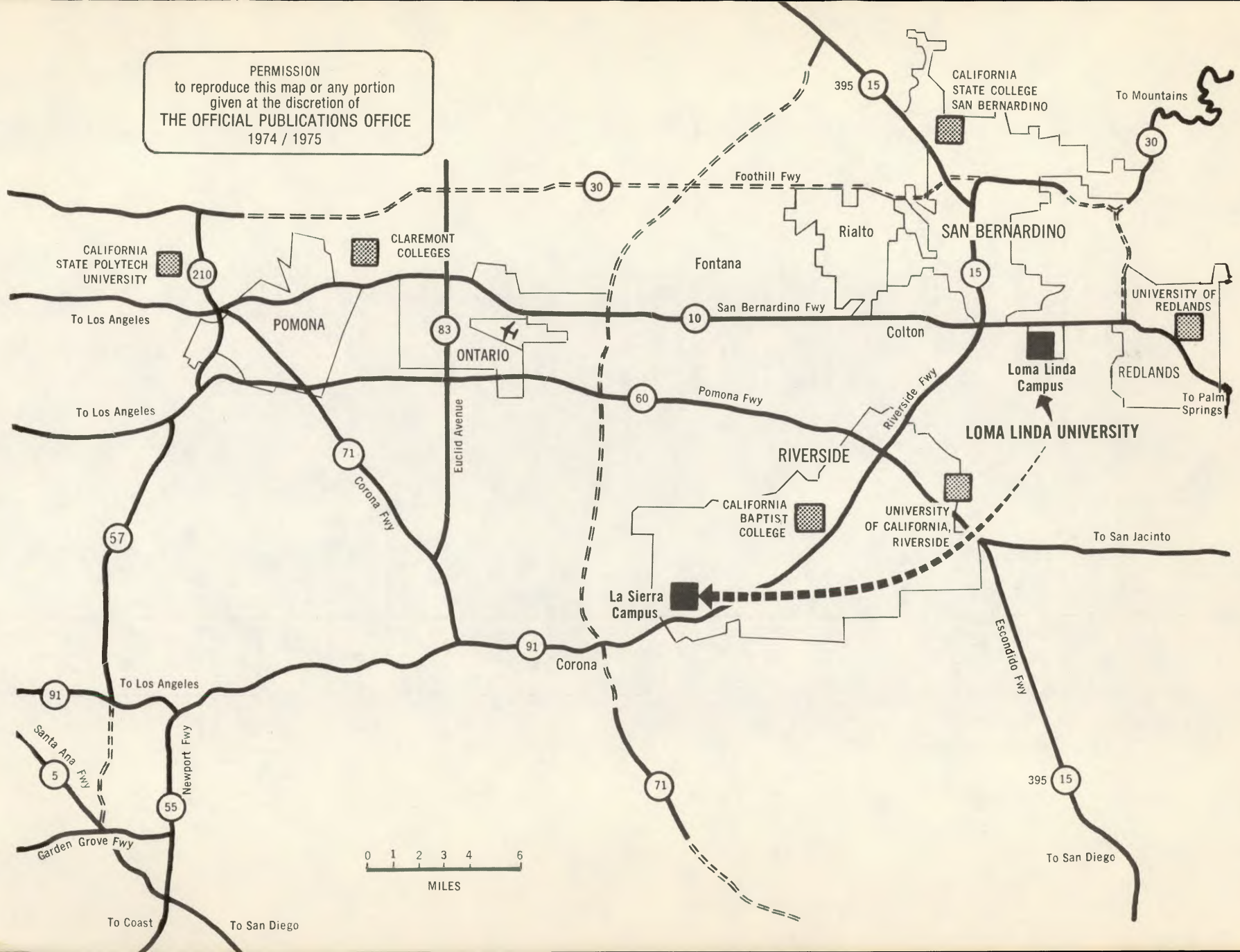
Interlibrary loan

Materials not available in either Library or in the immediate community are obtainable through the Interlibrary Loan service. At Loma Linda the teletypewriter (TWX) can be used for interlibrary communication. Teachers and graduate students can also be provided computer-printed bibliographies on medical-related subjects through the Medline services in which the Library participates.

COMPUTER SYSTEM

The Scientific Computation Facility, a computer complex located in the Medical Center, serves the students and faculty of the University in instructional and research functions. Available facilities span the range from small-scale to large-scale systems. Particular emphasis has been given to providing real-time data acquisition and graphical output capabilities. Programing aids are available to expedite the man-machine dialogue and to assist in applying the computer to the solution of problems in a variety of disciplines. An extensive program library serves many routine needs; but researchers are encouraged to write their own specialized programs for their own particular needs. Programing instruction and assistance are provided for this purpose.

PERMISSION
to reproduce this map or any portion
given at the discretion of
THE OFFICIAL PUBLICATIONS OFFICE
1974 / 1975



INDEX

FOR INFORMATION

Both campuses	General University interests	The President
	Admission	Admissions Office each school
	Student welfare, housing, visas	Student Affairs Office
	Student finance	Student Aid and Finance Office
	Records	Registrar's Office
La Sierra Campus	MAIL: Riverside California 92505	TELEPHONE (area 714): Riverside
	College of Arts and Sciences	Dean 785-2210
	School of Education	Dean 785-2266
	Summer/Extension	Dean 785-2214
Loma Linda Campus	MAIL: Loma Linda California 92354	TELEPHONE (area 714): 796-7311 Redlands 824-0800 San Bernardino 824-0800 Riverside
	School of Allied Health Professions ANESTHESIA DIETETICS MEDICAL RECORD ADMINISTRATION MEDICAL TECHNOLOGY OCCUPATIONAL THERAPY PHYSICAL THERAPY PUBLIC HEALTH SCIENCE RADIOLOGICAL TECHNOLOGY RESPIRATORY THERAPY	Dean
	School of Dentistry DENTISTRY DENTAL HYGIENE DENTAL ASSISTING	Dean
	School of Health	Dean
	School of Medicine	Dean
	School of Nursing	Dean
	Division of Religion	Director
	The Graduate School	Dean