

SCHOOL OF PUBLIC HEALTH

*Program in Hospital Administration*



The Hospital—dedicated  
to the service of mankind  
through co-operative effort

**Bulletin**

*of the UNIVERSITY of MINNESOTA*

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- Mrs. Geraldine B. Wedel, Assistant Executive Secretary, Minnesota Nurses Association, St. Paul
- Donald E. Wood, Executive Director, Twin City Regional Hospital Council, St. Paul

# *Program in Hospital Administration*

## GENERAL INFORMATION

The hospital as a social institution plays a vital role in the physical and mental health of the people of our nation. In 1875, there were fewer than 200 hospitals in the United States and only 35,000 hospital beds. Rapid advances in the medical sciences during the 20th century, together with a tremendous rise in the utilization of hospitals, created a demand for greatly expanded and improved facilities. As a result, the number of hospitals has mushroomed to approximately 7,000 and the number of hospital beds to more than 1.5 million. As a group, hospitals today comprise one of our country's largest and most essential service enterprises.

The growing importance of hospitals as a center of community health resources and the innate complexity of their organizational structure have made the management of these institutions a very specialized responsibility. The University of Minnesota was one of the nation's colleges and universities to recognize early the need for professionally educated administrators. In 1946, with the assistance of a 3-year grant from the W. K. Kellogg Foundation, it established the Program in Hospital Administration.

Although this program and other programs, leading to a Master's degree in hospital administration, have graduated a substantial number of individuals into the field, the demand for competent hospital administrators still exceeds the supply and will continue to do so for many years to come. Thus, the opportunities for growth and development in the field are extensive.

The Master's degree program was designed to produce practitioners in hospital administration and to help develop in them a broad philosophy toward the health field, so that its graduates might take their proper places in providing not only sound institutional management but also leadership within their professional organizations and in the community at large.

Throughout the first decade of the Master's program, another set of needs, directly relating to scholarship, began to be recognized. Teachers must be prepared for university hospital administration programs in the United States and elsewhere. Scholars capable of carrying on research in the health field financed by governmental agencies and private foundations must be developed. Some of these needs can be met by scholars trained in such areas as sociology, psychology, and industrial engineering, but each of these persons is trained to see just one part of the complex field of hospital administration. Someone must take the overview, must be in the position to unite these many facets and exert leadership toward common purposes and goals. The doctoral program in hospital administration is designed to help fill these needs.

## Admission Requirements

**Master's Degree Program**—It is realized that the students who apply for admission will present varying backgrounds and the program has been designed with this fact in mind. Applicants may be physicians, registered nurses, business administration graduates, ministers, members of religious orders, graduates of specialized professions within the health and welfare field, or others with special interests and aptitudes for hospital administration. Hospital experience is desirable but not essential.

All applicants must possess a degree equivalent to at least the baccalaureate level from an accredited educational institution. Only full-time students are accepted and

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no credit will be given for previous experience or instruction that would shorten either the academic year or the residency period. Applicants must also show evidence of personal capability, fitness, and motivation for work in the hospital field, and must have taken basic courses in the elements and principles of accounting. Prospective students who have not completed the latter may take these courses during the summer quarter or by correspondence prior to the beginning of the academic year.

Other courses which provide a desirable background but which are not essential for admission include human physiology, general bacteriology, principles of economics, principles of sociology, business law, credits and collection, business policy, cost accounting survey, cost accounting, government regulation of business, labor problems and trade unionism, public administration, recent social legislation, psychology in personnel work, fundamentals of speech, and advanced public speaking. The individual with a broad liberal arts education is considered as well as the person with a more specialized undergraduate degree.

All communications should be addressed to the Director, Program in Hospital Administration, School of Public Health, 1260 Mayo, University of Minnesota, Minneapolis 14. Admission application blanks will be supplied upon request. All applications preferably should be submitted before January 1 of the year in which the applicant intends to enter the program and must include the following items:

1. *Two* completed admission forms.
2. *Two* certified transcripts of the applicant's college record.
3. A letter indicating the applicant's previous work experience as well as his or her reasons for selecting the field of hospital administration.
4. Names of three references, preferably those familiar with the applicant's academic ability and work experience.

Applicants are expected to have an interview either with a member of the faculty or, if too distant, with an alumnus of the Program in Hospital Administration selected by the faculty.

To insure that all students receive the maximum benefit from their academic period, only a limited number of applicants, usually 30-35, are accepted each year for admission to the program. An advisory committee assists the program director in screening applicants. Selections are based on academic ability, personality, motivation, work experience, and references. Applicants are notified of their acceptance or rejection about April 1.

**Doctoral Program**—Since this program is designed to prepare those who wish to pursue scholarly careers as teachers or research workers in the highly complex field of health care, it provides for both intensive and broad education. The program is therefore interdepartmental in character and comes under the administration of the Graduate School, all the requirements of which must be met. Students successfully completing the program will have earned a doctor of philosophy degree. Some will have a major in hospital administration; others who wish to major in a social science may take a minor in hospital administration; and others may wish to major in hospital administration and also to major in a social science.

In any case, a candidate for doctoral work must have demonstrated marked academic ability and show potential for independent study and research. He must have at least a Bachelor's degree, preferably with a major in subject matter related to this curriculum. The attainment of a Master's degree in hospital administration is the first step for those who wish to major in this field at the doctoral level. Graduate work satisfactorily completed prior to entering the program may be submitted for credit. Each student's program will be individually planned to build upon his own background and interests. He will have 2 advisers, 1 from hospital administration and 1 from the social science field in which he takes his major or minor subject. Before taking his pre-

liminary examinations for the doctorate, the student will be required to pass a reading comprehension test in one or more foreign languages and to have met requirements in either a special research technique or a collateral field of knowledge.

Application for the doctoral program may be initiated either by correspondence with the Graduate School office or by writing directly to the Director, Program in Hospital Administration, School of Public Health, 1260 Mayo, University of Minnesota, Minneapolis 14. Admission application blanks will be supplied upon request. Before the admissions process is completed, the following items will be required:

1. Completed application forms, provided by the University.
2. Two certified transcripts of the applicant's college records, both undergraduate and graduate.
3. A letter indicating his previous work experience and his reasons for wishing to enter this program.
4. The names of three references, preferably those familiar with his academic ability and work experience.
5. An acceptable score on the Miller Analogies Test, Graduate Level.

A personal interview with a member of the faculty is considered highly desirable but is not compulsory.

The number of candidates is not limited in the doctoral program, but it is anticipated that classes will be small. The intention is to produce quality in scholarship rather than quantity.

## Expenses

### *Master's Degree Program* (1962-1963)

	Resident of Minnesota		Nonresident of Minnesota	
	Per Quarter	Per Year	Per Quarter	Per Year
Academic Year				
Tuition .....	\$150	\$450	\$310	\$930
Incidental* .....	20	60	20	60
Total .....	\$170	\$510	\$330	\$990
Residency Year				
Tuition (1 quarter only) .....	\$150		\$310	
Course fee (1 quarter only) .....	100		100	
Total .....	\$250**		\$410	
Graduation Fee .....	\$ 10		\$ 10	

### *Doctoral Program* (1962-1963)

	Resident of Minnesota		Nonresident of Minnesota	
	Per Quarter	Per Year	Per Quarter	Per Year
Tuition (for more than 6 credits) .....	\$ 86		\$225	
Incidental* .....	20		20	
Total .....	\$106		\$245	
Thesis Only .....	\$ 43		\$112.50	

\* The quarterly incidental fee entitles students to the privileges of Coffman Memorial Union, the University Health Service, the Speech Clinic, the Student Counseling Bureau, the *Minnesota Daily* (including the official Daily Bulletin), the University Address Book, and University recreational facilities.

\*\* The total fees for the residency year are due at the beginning of fall quarter of that year.

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### ***Living Expenses***

Living expenses will, of course, vary tremendously from person to person. As a general guide for *single students*, the University of Minnesota estimates that the average cost to the student for room and board in University residence halls during the 1962-63 academic year will be about \$285 per quarter. This figure does not include laundry and clothing expenses nor does it account for such items as recreation and travel.

It is virtually impossible to estimate living costs for married students because of the variance in the size of their families, the standard of living which they wish to maintain, and the type and size of the accommodations they desire. Such students will have to estimate these expenses for themselves on the basis of their own personal experience. Rent is a major item of expense for married students. As a general rule, they can expect to pay from \$45 to \$80 per month for housing in University-maintained facilities and a higher amount for private accommodations. The figures quoted are based on the rental rates in effect during the 1962-63 academic year and, except for Thatcher Hall, include heat and all other utilities except the telephone.

For further information concerning housing in University-maintained facilities or in private rooming houses, consult the *Bulletin of General Information* of the University of Minnesota or write to Director of Student Housing, 209 Eddy Hall, University of Minnesota, Minneapolis 14.

### **Student Services and Activities**

**Library**—The University's system of libraries ranks seventh in size among the university research libraries in the United States. Of particular importance to hospital administration students is the Bio-Medical Library located opposite the Mayo Memorial Building where the Program in Hospital Administration is situated.

In addition to the above facilities, the Program in Hospital Administration has two complete libraries of its own. The volumes, journals, and other materials in these libraries are specifically concerned with hospitals, management, and related areas such as medicine and public health.

**University Health Service**—The maintenance of student health is a major concern of the University. The Health Service, located adjacent to the University Hospitals, provides complete medical care facilities and health counseling for all students.

**Food Services**—Most of the University dormitories operate dining rooms for their residents. In addition, Coffman Memorial Union has a large cafeteria, two grills, and a soda fountain. The Union also maintains "commuter" lunchrooms for students who desire to bring their own lunches.

**Cultural, Social, and Recreational Opportunities**—Numerous cultural, social, and recreational opportunities are available to students on the University Campus and in the surrounding area.

For additional information regarding student services or cultural, social, and recreational opportunities, consult the University of Minnesota *Bulletin of General Information*.

### **Financial Aids**

**Student Loans**—Numerous loan funds are available to hospital administration students who need financial assistance. These funds vary somewhat in their rates of interest, the amount of money that can be borrowed, and in the requirements students must meet.



## *General Information*

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The Bureau of Student Loans and Scholarships, located at 201 Eddy Hall on the Minneapolis Campus, administers the majority of the loan funds. Additional information about these funds can be secured from this bureau or from the Director of the Program in Hospital Administration.

**Special Stipends**—Stipends for doctoral students have been granted to the University for a limited time period by the W. K. Kellogg Foundation. Inquiries should be addressed to the director of the Program in Hospital Administration.

**Student Employment**—The Program in Hospital Administration at the University of Minnesota does not object to the outside employment of its students during the academic year provided such employment does not interfere with the satisfactory completion of their studies and their other responsibilities to the program. However, the heavy schedule does not permit much time for such employment.

The Student Employment Bureau, located in room 153 TSF (Temporary South of Folwell Hall), maintains a file of available full-time and part-time jobs on the University campus and in the Twin Cities. Students who desire the assistance of the bureau in obtaining employment must apply **in person** before they will be considered for any of the available positions.

The responsibilities of hospital administration students during the residency year are such that outside employment on either a full-time or a part-time basis is not permitted.

## PROGRAMS OF STUDY

### Master's Degree Program

The Program in Hospital Administration at the University of Minnesota is organized under the School of Public Health, a unit of the College of Medical Sciences. It also draws upon other University departments and upon the facilities of the hospitals and related institutions in the area. The academic curriculum consists of a central core of subjects pertaining directly to hospital administration, plus supplementary instruction in related fields.

The course of study is entirely on the graduate level and covers a period of 21 months. It consists of an academic year of 3 quarters in full-time attendance at the University and an administrative residency of 1 calendar year under a faculty-appointed clinical preceptor in an approved hospital. Upon satisfactory completion of the program, students are awarded the degree of master of hospital administration.

Geographically, the University of Minnesota is well situated with respect to the education of hospital administrators. With more than 30 hospitals of varying sizes and types of ownership and control in Minneapolis and St. Paul, the opportunities for observation and effective field work are excellent. The support of these and other hospitals throughout the state is a vital and integral part of the program. The cooperation of the local, state, and regional hospital associations is of similar value.

#### *Objectives*

The objective of the Master's Program in Hospital Administration at the University of Minnesota is to prepare men and women to achieve, after the requisite years of practical experience in responsible supervisory and managerial positions, the chief executive status of administrator or director of a hospital. The program aims to improve the capability of future hospital administrators for effective participation in the making of decisions that will raise the level of operation of their individual hospitals and benefit the individual patient as well as the health service as a whole. Recognition is given the fact that the successful hospital administrator must have personal qualities meriting the respect of others, sympathetic understanding of human values and motivations, and an acute awareness of the impact of the hospital's policies on the community, the associated health activities, and society. With these goals in mind, the curriculum emphasizes breadth of learning in contrast to advanced technical development.

#### *Academic Year*

The academic year begins with the fall quarter. Each of the 3 quarters is designed to provide a mixture of courses pertaining directly to hospital administration and courses in related areas. Students are graded in each course and must maintain a grade point average of 2.5 (based on A = 4, B = 3, C = 2, and D = 1).

Class lectures and seminars are supplemented throughout the year by field trips to hospitals and related institutions in the Twin Cities and the state. Practical administrative experience is provided during the winter quarter when students are assigned to various hospitals in Minneapolis and St. Paul to work on an existing management problem.

In the spring quarter, students are encouraged to attend the convention of the Upper Midwest Regional Hospital Conference which is held each year in either Minneapolis or St. Paul. The convention gives them an opportunity to meet and associate with a large number of administrators and other hospital personnel from a

wide area. In addition, the convention's exhibit hall permits them to see many of the new developments in hospital equipment and supplies. Students also attend the annual week-long in-service Institute for Hospital Administrators which is sponsored jointly by the Program in Hospital Administration, the American College of Hospital Administrators, and the Minnesota Hospital Association, and held at the Center for Continuation Study on the University of Minnesota campus in February.

### *Residency Year*

The Program in Hospital Administration guides and assists students in obtaining administrative residencies in approved hospitals. The administrators of these institutions hold University faculty appointments as clinical preceptors on a continuing basis and residents are placed with them each year.

The resident's schedule during this second year will vary with the individual hospital. Under the pattern most commonly employed, the resident rotates through the different hospital departments for the first 3 to 6 months. Such a rotation gives the resident an opportunity to observe and participate in the work of the various departments. It allows him to gain an insight into the role these departments play in the total hospital program, their organization, standards of performance, methods of control, and major problems of operation.

Following the rotation period, the resident normally functions as a member of the administrative staff. Under the close supervision of the preceptor, he is given assignments which carry some independent responsibility and is assigned to work on specific management problems.

Twelve credit hours are granted for satisfactory completion of the residency period, including the submission of an acceptable thesis.

**Residency Thesis**—During the residency period, each student is required to prepare and submit a thesis. This thesis is a research project for the purpose of gaining an appreciation and understanding of research design and methodology. The subject matter is selected by the resident but must be approved by both the preceptor and a member of the academic faculty.

**Faculty Visits**—Normally, a faculty member visits each resident and preceptor during the year. Such visits enable the faculty to determine the resident's progress, to evaluate the various residency programs, and to assist in co-ordinating the academic and residency years.

**Student Evaluation Reports**—Periodically during the year, the residents are formally evaluated by their preceptors on the skills they should be developing in the residency period and on their personal characteristics. The preceptors submit these evaluations to the program after discussing them with the residents.

**Residents' Institutes**—In June of their residency year, students return to the University campus for a week of lectures, seminars, and discussions on hospital operation and administration. This provides an academic ending to the students' formal training in hospital administration. In addition, it gives the students an opportunity to review and evaluate their residency experience and, by sharing this experience with others, to gain an insight into varying types of hospital operation and methods of administration and control.

**Preceptors' Meetings**—A successful administrative residency depends, in large measure, upon the role assumed by the clinical preceptor and his relationship to the student. The clinical preceptors and the academic faculty meet annually at the University in joint session to evaluate the residency period, to develop a mutual under-

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standing of the objectives and content of the program, and to achieve co-ordination between the academic and residency years.

**Residency Stipends**—The stipends received by students during the residency period vary considerably from one hospital to another. Stipends help to defray living and other expenses during that period. In addition, full or partial maintenance is granted administrative residents at some hospitals.

### ***Research Program***

There is a growing emphasis on research in the hospital field. Students in the Program in Hospital Administration have an opportunity to develop skills in this area during the academic and residency years. A full-time research staff was added to the faculty in 1955, and currently research is being carried out at both the faculty and student levels. Research projects are principally supported by grants from governmental and foundation sources.

### ***Student Awards***

Five awards are given each year. The *James A. Hamilton Award* is given to the member of the graduating class who shows the "greatest promise of achievement" in the field of hospital administration. The *Sabra M. Hamilton Award* is presented to the graduating student who writes the "best research or management report." The *Class of 1954 Award* is given to the student who submits the "best hospital clerkship paper" during the academic year. The *American Surgical Trade Association Awards* are presented for outstanding scholarship in the academic period—1 for the highest scholastic average in the administration courses and 1 for the highest scholastic average in the public health courses.

### ***Summary of Master's Degree Program***

(Credits shown in parentheses)

#### ***First Year—Fall Quarter***

- PubH 100A—Elements of Public Health (3)
  - PubH 160—Principles of Administration in Hospitals (6)
  - PubH 161—History and Development of Hospitals (3)
  - PubH 162—Principles of Organization and Management of Hospitals (3)
  - PubH 168—Orientation to Medical Sciences (3)
- Total fall quarter credits (18)

#### ***First Year—Winter Quarter***

- PubH 100B—Elements of Public Health, Group Work (1)
  - PubH 106—Public Health Administration (3)
  - PubH 108—Introduction to Biostatistics and Statistical Decision (2)
  - PubH 163—Principles of Organization and Management of Hospitals (6)
  - PubH 166—Hospital Clerkship (5)
  - Spch 106A—Public Speaking and Conference Leadership (3)
- Total winter quarter credits (20)

#### ***First Year—Spring Quarter***

- PubH 100C—Elements of Public Health, Group Work (1)
  - PubH 107A—Maternal and Child Health (1)
  - PubH 109—Institutional Sanitation (3)
  - PubH 125A—Public Health Education (1)
  - PubH 141—Social and Economic Aspects of Medical Care (3)
  - PubH 164—Principles of Organization and Management of Hospitals (6)
  - PubH 167—Management Problems in Hospital Administration (6)
  - PubH 170A—Public Health Nursing (1)
  - PubH 210—Public Health Seminar (3 quarters) (1)
- Total spring quarter credits (23)  
Total credits for first year (61)

#### ***Second Year (Residency)***

- PubH 169—Administrative Residency (12)
- Total credits for second year (12)  
Grand total (73)

## **Doctoral Program**

### *Objectives*

This program is designed to prepare those who wish to pursue scholarly careers as teachers or research workers in hospital administration. It is believed that the program best suited to meet the needs of such scholars must be a flexible one which allows maximum freedom for each individual to build upon his specialized background and interests. It is interdepartmental in character, each student having 2 advisers, 1 from hospital administration where most students will take their major work, and 1 from a relevant department such as business administration, political science, or sociology. It is possible for students majoring in one of the social sciences to minor in hospital administration. It is also possible to carry two majors. The program is under the administration of the Graduate School and students successfully completing it are entitled to the degree of doctor of philosophy.

Regardless of his individual selection of courses, the objectives of this program remain essentially the same. Each student is given opportunity to:

1. Extend his knowledge and understanding of the hospital as a social institution; of its relation to society, the nation, and the health field; and of the basic forces which affect hospital service.
2. Acquire additional knowledge of administration in the related fields of public health, business, and political life.
3. Acquire competency in a second field of knowledge, usually a social science, which may deepen and enrich his understanding of the hospital and its social milieu.
4. Acquire knowledge in research theory and methods, as well as in the philosophy of teaching, according to his particular interest.
5. Acquire competency in one or more foreign languages.

### *Requirements for Hospital Administration Majors*

*Language*—Either (a) 2 foreign languages, or (b) 1 foreign language and the option of either a special research technique or a collateral field of knowledge. The special research technique could be biostatistics, mathematics, or another method of measurement. The collateral field could be a second social science, education, industrial engineering, or a sequence in the philosophy of science.

*Course Work*—Each student's program of study will be arranged individually with the assistance of his advisers, from lists of required and elective courses in each of the following areas. It is estimated that course work will require 2 years, following the Master's degree program. Work on the thesis and on research or teaching experience will further extend the time period.

#### *Area I: Administration—Management*

This will include courses in hospital administration, business administration and public administration. There will be a series of integrating seminars given to help relate major and minor studies.

#### *Area II: Public Health*

Work will be distributed among four areas: public health administration, sanitation, epidemiology, and biostatistics.

#### *Area III: Social Science*

Each student will take a minor in one of the social sciences, or a second major if such is his choice. Among acceptable departments for the graduate minor are anthropology, economics, political science, psychology, sociology.

## *Program in Hospital Administration*

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### *Thesis*

The doctoral dissertation shall deal with a significant problem concerning health care services as they relate to the role and function of the hospital in society.

### *Teaching and Research Experience*

Interested students will be given opportunity to participate in the on-going research program conducted by the faculty, according to their individual capacities and inclinations. Similarly, those preparing to teach will be given opportunity to develop teaching skills.

## DESCRIPTION OF COURSES

(A sharp sign [#] means "consent of instructor")

- PubH 100A. Elements of Public Health.** Susceptibility and resistance to disease; occurrence and prevention of communicable, degenerative, and industrial diseases; school health work; vital statistics. (3 cr) Anderson, Thomson, Schuman
- PubH 100B. Elements of Public Health II.** Group work in evaluation and solution of representative community health problems. (1 cr) Staff
- PubH 100C. Elements of Public Health.** Group work continued. (1 cr) Staff
- PubH 106. Public Health Administration.** Structure, basic functions, and activities of public health agencies. (3 cr; prereq 100A) Anderson, Hamilton
- Spch 106. Public Speaking and Conference Leadership.** The management of basic communication problems in administration. Discussion and exercises in communication problems, informational speaking, persuasive speaking, conference forms, and conference leadership. (3 cr) Smith
- PubH 107A. Maternal and Child Health.** Community programs for major maternal and child health problems. (1 cr)
- PubH 108. Introduction to Biostatistics and Statistical Decision.** Sources of vital statistics; calculation of rates; graphical exposition. Differentiation and association; test of significance; estimation; design of experiments; decision making. (2 cr) Bearman
- PubH 109. Institutional Sanitation.** Sanitation practices in hospitals and other institutions. (3 cr) Bosch, Olson, Bond
- PubH 125A. Public Health Education.** Purposes, scope, methods, and materials; planning, with special emphasis on hospitals. (1 cr; hospital administration only) Groat
- PubH 141. Social and Economic Aspects of Medical Care.** A survey of social and economic forces affecting administration and financing of medical care; the need for sickness insurance, group hospitalization; the concern of government in the provision of prepaid medical care. (3 cr)
- PubH 160. Principles of Administration in Hospitals.** Lectures, seminars, and field trips in hospital administrative principles; top management and board of trustees, personnel policy formation, human relations, research in administration. (6 cr) Hamilton, Stephan, Lentz
- PubH 161. History and Development of Hospitals.** Lectures and seminars in orientation to the hospital field; history of hospitals; development of hospital functions; hospital ownership and control; promoting and building new hospitals; integrated hospital service; functions and organization of national hospital associations and foundations. (3 cr) Stephan, Kincaid, Laur
- PubH 162. Principles of Organization and Management of Hospitals.** Lectures and seminars in organization principles; nursing service, nursing education and medical staff. (3 cr) Stephan, Hamilton, Laur
- PubH 163. Principles of Organization and Management of Hospitals.** Lectures, seminars and field trips in medical records, outpatient department, X-ray, laboratories, anesthesia, pharmacy, physical therapy, occupational therapy, medical social service, library, mental hospitals, tuberculosis hospitals, chronic hospitals, convalescent hospitals, group practice, training of interns and residents, relations with trustees, and hospital ethics. (6 cr; prereq 162) Stephan, Bieter, Damberg, Kincaid, Sweetland, Laur
- PubH 164. Principles of Organization and Management of Hospitals.** The personnel department in the hospital, organization and functions, development of sound policies and procedures. Hospitals from a legal standpoint, tax exemption, negligence and liability, licensure, and medical malpractice. Analysis of financial reports and methods of preparing and utilizing the operating budget, insurance, and insurance problems. (6 cr; prereq 162 and 163) Stephan, Bieter, Hoche, Michaels

## *Description of Courses*

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- PubH 166. Hospital Clerkship.** Assignment to local hospital for solution of special management problem. (5 cr) Bieter, Hoche
- PubH 167. Management Problems in Hospital Administration.** The assignment and solution of specific managerial problems of varying degrees of scope and in major importance. (6 cr; prereq 162 and 163, to be taken concurrently with 164) Hamilton, Hoche, Sweetland, Laur
- PubH 168. Orientation to Medical Sciences.** Orientation to medical sciences including medical terminology, basic roots, prefixes, suffixes, and units used in medical vocabulary; normal physiology; fundamentals of medicine and surgery. (3 cr) Hamilton
- PubH 169. Administrative Residency.** Field work of 1 calendar year's duration in an approved hospital. Orientation to the specific hospital, weighted rotation through hospital departments, and the solution of special problems. (12 cr) Hamilton, Stephan, Lentz, Jaco, Michaels, Laur
- PubH 170A. Public Health Nursing.** Scope of public health nursing; relationships to other aspects of public health. (1 cr) Murphy, Fritz
- PubH 210. Public Health Seminar.** (Cr ar) Staff
- PubH 261-262-263. Alternative Patterns for Meeting Health Care Needs.** Future role of hospital in light of patient needs and community services. (3 cr per qtr; prereq #) Hamilton, Stephan, Lentz
- PubH 264. Seminar on Medical Care Patterns Abroad.** Readings, discussion, guest lectures on relations between health services and other social institutions. (3 cr; prereq #) Stephan, Lentz
- PubH 265. Seminar on Research Studies on Health Services.** Appraisal of design, instruments, field-work procedures and findings of existing studies. (3 cr; prereq #) Lentz, Jaco
- PubH 266. Hospital Administration Topics.** Independent study under tutorial guidance on selected problems, current issues. (Cr ar; prereq #) Hamilton, Laur



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# *School of Public Health*

## 1962-1964



“Health is a state of complete physical, social and mental well-being, and not merely the absence of disease or infirmity.”

— WORLD HEALTH ORGANIZATION

## Bulletin

*of the UNIVERSITY of MINNESOTA*

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Allyn G. Bridge, M.D., M.P.H., Lecturer; Chief, Section of Maternal and Child Health, Minnesota Department of Health

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 William N. Wallace, B.A., M.H.A., Clinical Preceptor; Administrator, Charles T. Miller Hospital, St. Paul

### Field Associates

Marion T. Bryant, M.P.H., Chief, Bureau of Health Education, County of San Diego Department of Public Health, San Diego, California  
 Allen Buckingham, M.P.H., Director, Division of Community Services and Health Education, Wyoming Department of Health, Cheyenne, Wyoming  
 K. Elizabeth Burrell, M.A., Director of Health Education, Montana State Health Department, Helena, Montana  
 Celia M. Cagnoni, R.N., B.S., Chief Nurse, School Hygiene, St. Paul Public Schools  
 Muriel L. Colquhoun, Bureau of Vital Records, Division of Public Health, Minneapolis  
 M. B. Crabill, M.P.H., Director, Division of Sanitation, Omaha-Douglas County Health Department, Omaha, Nebraska  
 Violet DuBois, M.P.H., Director, Division of Health Education, Omaha-Douglas County Health Department, Omaha, Nebraska

- Donald B. Ferguson, M.S.P.H., Health Education Supervisor, Tuberculosis Institute, Chicago and Cook County, Chicago, Illinois
- Mario Fischer, M.D., Director of Public Health, Duluth and St. Louis County Health Departments, Duluth, Minnesota
- Lloyd A. Frost, M.P.H., Chief, Health Education Division, Contra Costa County Health Department, Martinez, California
- Violet Glycer, R.N., B.S., Supervisor, Tuberculosis Division, St. Paul Bureau of Health, St. Paul
- Mary Graupman, R.N., B.S., Assistant Supervising Nurse, Rochester-Olmsted County Health Unit, Rochester
- Margaret Griffin, R.N., B.S., Educational Consultant, Family Nursing Service, St. Paul
- Ann W. Haynes, M.P.H., Chief, Bureau of Health Education, California Department of Public Health, Berkeley, California
- Ann Z. Kinstler, R.N., B.S., Supervisor, Parochial School Nurses, St. Paul Bureau of Health, St. Paul
- Vera Lundstrom, R.N., B.S., Supervisor, Rural Hennepin County Nursing District, Minneapolis
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- Elta M. Mast, M.S.P.H., Health Educator, Division of Indian Health, U.S. Public Health Service, Window Rock, Arizona
- Norbert Reinstein, M.P.H., Program Director, Tuberculosis and Health Society, Detroit, Michigan
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- Harlan Stricklett, M.P.H., Director, Health Education, Tuberculosis Institute of Chicago and Cook County, Chicago, Illinois
- Lidwina Suek, R.N., M.P.H., Chief Nurse, Health Service, Public Schools, Minneapolis

### Special Lecturers, 1960-1962

- Leland E. Aase, B.S., M.P.H., Director, Bureau of Vital Statistics, Wisconsin State Board of Health
- Frank Acosta, Information Officer, Bureau of State Services, U.S. Public Health Service, Washington, D.C.
- Ernest A. Ager, M.D., M.P.H., Head, Communicable Disease Control, Washington State Department of Health
- Peter Armitage, Ph.D., University of London, England
- Albert E. Bailey, Ph.D., Director, Division of Statistics and Records, Pennsylvania Department of Health
- Clyde Berry, Ph.D., Associate Director, Institute of Agricultural Medicine, College of Medicine, State University of Iowa
- Lydia Berving, B.A., Bureau of Records and Statistics, Illinois Department of Public Health
- Lester Breslow, M.D., M.P.H., Chief, Division of Preventive Medical Services, California State Department of Public Health
- Gerald F. Briggs, B.S., Vice President-Chief Engineer, Edward E. Johnson, Inc., St. Paul
- Philip S. Broughton, Secretary, A.W. Mellon Educational and Charitable Trust, Pittsburgh, Pennsylvania
- Irene Brzezinski, M.P.H., Health Education Consultant, Tuberculosis Institute of Chicago and Cook County, Chicago, Illinois
- James D. Caldwell, M.S., Public Health Engineer, International Cooperation Administration, Washington, D.C.
- Charles E. Carl, M.S., Director, Division of Sanitary Engineering, South Dakota State Health Department

Loren E. Chancellor, B.A., Director, Division of Vital Statistics, Iowa State Department of Health

C. L. Chiang, Ph.D., University of California, Berkeley

William G. Cochran, M.A., Statistics Department, Harvard University

Gertrude M. Cox, D.Sc., Research Triangle Institute, Durham, North Carolina

J. F. Daly, Ph.D., Bureau of the Census, Washington, D.C.

Lloyd F. Detwiller, M.H.A., Assistant Deputy Minister of Hospital Insurance, B.C. Hospital Insurance Service, Victoria, British Columbia, Canada

Margaret M. Drolette, Department of Biostatistics, Harvard School of Public Health

Halbert L. Dunn, M.D., Ph.D., National Office of Vital Statistics, Washington, D.C.

Ralph E. Dwork, M.D., M.P.H., Director, Ohio Department of Health

Carl E. Erhardt, M.P.H., Chief, Division of Vital Records, New York City Department of Health

Gordon M. Fair, M.S., Dr.Eng., Abbott and James Lawrence Professor of Engineering and Gordon McKay Professor of Sanitary Engineering, Harvard University

Ruth Freeman, M.A., Ed.D., Professor of Public Health Administration, School of Hygiene and Public Health, Johns Hopkins University

Lincoln Gerende, M.P.H., Biostatistics Division, Department of Epidemiology and Public Health, Yale University

Bernard G. Greenberg, Ph.D., Head, Department of Biostatistics, School of Public Health, University of North Carolina

Morris Hansen, LL.D., Bureau of the Census, Washington, D.C.

Boyd Harshbarger, Ph.D., Head, Department of Statistics, Virginia Polytechnic Institute, Blacksburg, Virginia

Austin Heady, B.A., Statistician, Social Medicine Research Unit, London Hospital, London, England

Arthur W. Hedrich, D.Sc., Retired Director of Vital Statistics, Maryland State Department of Health

Fay M. Hemphill, Ph.D., National Institutes of Health, Bethesda, Maryland

Elizabeth Hilborn, R.N., International Cooperation Administration, Washington, D.C.

J. Stanley Hill, Vice-President and Actuary, Minnesota Mutual Life Insurance Company, Minneapolis

Malcolm C. Hope, M.S., M.H.A., Sanitary Engineer Director, U.S. Public Health Service, Washington, D.C.

John Harty, LL.B., Professor of Public Health Law, University of Pittsburgh

Deane L. Huxtable, Registrar, Bureau of Vital Statistics, Virginia Department of Health

Emil H. Jebe, Ph.D., Research Professor, Willow Run Laboratories, University of Michigan

A. Harris Kenyon, B.S., Director, Minneapolis District, Food and Drug Administration, Minneapolis

Leslie Kish, Ph.D., Survey Research Center, University of Michigan

Dankward Kodlin, M.D., M.P.H., School of Public Health, University of Pittsburgh

Robert F. Korn, M.D., Dr.P.H., Assistant Commissioner, New York State Department of Health

Harry P. Kramer, M.S., Chief, Training Program, Robert A. Taft Sanitary Engineering Center, U.S. Public Health Service, Cincinnati, Ohio

Charlotte Leach, B.S., M.S.P.H., Consultant in Health Education, National Tuberculosis Association, New York

Robert F. Lewis, Ph.D., Head, Division of Biostatistics, Tulane University

C. C. Li, Ph.D., Professor of Genetics, School of Public Health, University of Pittsburgh

John A. Lichty, M.D., M.P.H., Director, Section of Chronic Disease, Colorado State Department of Public Health

James Lieberman, D.V.M., M.P.H., Assistant Chief, Training Branch, Communicable Disease Center, U.S. Public Health Service, Atlanta, Georgia

Joseph A. Lieberman, Dr.Eng., Chief, Environmental and Sanitary Engineering Branch, U.S. Atomic Energy Commission



Arthur S. Littell, D.Sc., Professor of Biostatistics, Western Reserve University  
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 Robert E. Reed, Ph.D., Head, Department of Biostatistics, Harvard School of Public Health  
 Dean Roberts, M.D., M.P.H., Executive Director, National Society for Crippled Children and Adults, Chicago, Illinois  
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 Paul W. Shipley, B.S., Chief, Bureau of Vital Statistics and Data Processing, California State Department of Public Health  
 Rexford D. Singer, B.S., M.P.H., Instructor, Department of Engineering, South Dakota State College  
 Monroe G. Sirhen, Ph.D., Chief, Actuarial and Survey Branch, National Office of Vital Statistics, Washington, D.C.  
 Donald L. Snow, M.S., Chief, Sanitary Engineering Branch, National Institutes of Health, Bethesda, Maryland  
 James Steele, D.V.M., M.P.H., Chief, Veterinary Public Health Section, Communicable Disease Center, U.S. Public Health Service, Atlanta, Georgia  
 Theodore D. Sterling, Ph.D., Professor of Epidemiology, University of Cincinnati  
 Herbert S. Stokinger, Ph.D., Director, Occupational Health Research, Occupational Health Field Headquarters, U.S. Public Health Service, Cincinnati, Ohio  
 Conrad P. Straub, Ph.D., Chief, Radiological Health, Robert A. Taft Sanitary Engineering Center, U.S. Public Health Service, Cincinnati, Ohio  
 George Taylor, M.S., Chief, Foreign Hydrology Section, U.S. Geological Survey, Washington, D.C.  
 Donovan J. Thompson, Ph.D., Department of Biostatistics, School of Public Health, University of Pittsburgh  
 Irving R. Vaughn, B.A., Director, Division of Records and Statistics, Allegheny County Health Department, Pittsburgh, Pennsylvania  
 W. H. Veigel, Chief, Division of Vital Statistics, Ohio Department of Health  
 Edmund G. Wagner, B.S., M.P.H., Public Health Engineer, International Cooperation Administration, Washington, D.C.  
 Myron Wegman, M.D., M.P.H., Dean, School of Public Health, University of Michigan  
 Colin White, M.S.C., M.B., Professor and Head, Biostatistics, Yale University

Emmet D. Williams, Superintendent, Roseville Schools, St. Paul  
G. Stanley Woodson, M.A., Biostatistician, University of Michigan  
Paul Woolrich, M.S., Division of Occupational Health, U.S. Public Health Service, Cincinnati, Ohio  
Raymond F. Wrighton, Ph.D., Statistician, University of Birmingham, England

### Special Lecturers in Hospital Administration, 1960-1962

Kenneth B. Babcock, M.D., Director, Joint Commission on Accreditation of Hospitals, Chicago, Illinois  
Harriet E. Blodgett, Ph.D., Director, The Sheltering Arms, Minneapolis  
George Bugbee, B.A., President, Health Information Foundation, New York, New York  
O. J. Campbell, M.D., Surgeon, Minneapolis  
Rosemary Chaix, B.S., Chief Dietitian, Fairview Hospital, Minneapolis  
Dean Conley, B.B.A., Executive Director, American College of Hospital Administrators, Chicago, Illinois  
Thomas Cook, B.S., Executive Secretary, Hennepin County Medical Society, Minneapolis  
Edwin L. Crosby, M.D., D.P.H., Executive Director, American Hospital Association, Chicago, Illinois  
Paul M. Densen, D.Sc., Deputy Commissioner of Health, City of New York, New York  
Franz Goldmann, M.D., Associate Professor of Medical Care, Harvard University  
Mrs. Russell Hanson, President, Hospital Auxiliary, Benson, Minnesota  
Warren B. Hempstead, Physicians' and Hospitals' Supply Company, Inc., Minneapolis  
William W. Jepson, M.D., Psychiatrist, Minneapolis  
Ronald A. Jydstrup, M.H.A., Executive Director, Rochester Regional Hospital Council, Rochester, New York  
Eugene Keating, B.A., LL.B., Attorney at Law, Minneapolis  
Frank Krusen, M.D., Director, Kenny Rehabilitation Institute, Minneapolis  
Lucile P. Leone, M.A., L.D.H., D.Sc., Litt.D., Chief Nurse Officer, U.S. Public Health Service, Washington, D.C.  
Frederick Lott, M.D., Pathologist, Minneapolis  
John R. Mannix, Executive Vice President, Blue Cross of Northeast Ohio, Cleveland, Ohio  
J. P. Medelman, M.D., Radiologist, St. Paul  
Mildred Norval, M.D., Director, Crippled Children's Services Program for Minnesota  
Andrew Pattullo, M.B.S., Director, Hospital Division, W. K. Kellogg Foundation, Battle Creek, Michigan  
John W. Poor, B.A., Director, Division of Public Assistance, Minnesota Department of Welfare, St. Paul  
Oliver G. Pratt, B.S., Executive Vice President, Rhode Island Hospital, Providence, Rhode Island  
C. J. Rowe, M.D., Psychiatrist, St. Paul  
Glen V. Taylor, B.A., Executive Secretary, Minnesota Hospital Association, Minneapolis  
David J. Vail, M.D., Director, Minnesota Department of Public Welfare, St. Paul  
Howard M. Winholtz, M.H.A., Associate Administrator, Methodist Hospital, Rochester, Minnesota  
Donald E. Wood, M.H.A., Executive Director, Twin City Regional Hospital Council, St. Paul

# SCHOOL OF PUBLIC HEALTH - 18

## GENERAL INFORMATION - 12

The School of Public Health offers a wide selection of general and professional courses in the field of preventive medicine and public health. The general courses are designed for the student who desires some knowledge of personal health and an understanding of the community program that exists for the promotion of the public health. The professional courses are intended to furnish technical training for those who seek a career in public health work or who wish to use technical knowledge and procedures in their future work in allied fields.

**Development of the School**—Instruction in preventive medicine and public health has been conducted at the University of Minnesota for more than half a century. The course in public health nursing, one of the first in the country, was established in 1918. In 1922 a separate Department of Preventive Medicine and Public Health was established in response to the increasing demand for health education and for trained leaders in public health. Graduate courses in public health have been offered since that time. In 1935 the University of Minnesota was selected by the health officers of the adjacent states as the institution to which they desired to send personnel for public health training under provisions of the Social Security Act. Curriculums for the training of health officers and public health engineers were established at that time. In 1944 the Board of Regents authorized expansion of the Department of Preventive Medicine and Public Health into a School of Public Health.

The School is accredited by the American Public Health Association for work leading to the degrees of master of public health and master of science (with major in health education). The program of study in public health nursing is accredited by the National League for Nursing.

The School occupies two and a half floors of the new Mayo Memorial building of the University of Minnesota Medical Center. Here are located teaching and research laboratories, classrooms, conference rooms, and the offices of the School. The Laboratory of Physiological Hygiene is separately situated at the Memorial Stadium only 3 blocks distant.

The teaching programs have been developed in close collaboration with other departments in the medical sciences and with departments dealing with collateral fields of knowledge, in particular with the biological sciences, dentistry, education, engineering, journalism, the social sciences, and veterinary medicine. Practical field experience and observation are provided through a close working relationship with many official and voluntary public health agencies. The Minnesota Department of Health maintains its offices and laboratories on the Minneapolis Campus, and its staff participates actively in teaching. The public health services of Minneapolis and St. Paul likewise share in teaching responsibilities. The City-County Health Unit at Rochester, Minnesota, has been developed with the assistance of the Kellogg Foundation as a field training area. Supervised field training is also available through co-operation of public health agencies elsewhere in Minnesota and in other states.

**Professional Programs in Public Health**—The School of Public Health provides programs of graduate study for health officers, public health nurses, public health educators, public health veterinarians, vital statisticians, hospital administrators, and scientists, engineers, and sanitarians in the field of environmental health. Arrangements also can be made for other persons with professional training and public health experience, notably dentists and laboratory personnel.

The program of study emphasizes training of a co-ordinated team of professional workers, each member of which has some understanding and appreciation of the contributions which each of the disciplines makes to the broad field of public health. To this end, all students pursuing courses of study leading to a professional degree in public health are required to take the basic core course (PubH 100A, B, C) and courses in epidemiology, health education, public health administration, public health nursing, sanitation, and statistics. To this nucleus of required courses, which so far as possible all advanced students take together, each of the professional groups adds courses from its respective field of special interest.

The programs of study are arranged as orderly sequences of courses extending over at least 1 academic year (3 University quarters) of postgraduate work. The programs in public health nursing and in health education extend 1 or 2 additional quarters, while students in the programs in environmental health are expected to begin during the second term of Summer Session preceding the academic year of study. Students wishing to pursue advanced work to acquire special competence in one of the fields of public health such as epidemiology, maternal and child health, or some aspect of environmental health should plan one or more extra years beyond the Master's degree. In all cases the student should plan to begin work in a fall quarter, or at the beginning of the second term of Summer Session.

**Program in Hospital Administration**—A 2-year graduate program in hospital administration was established in the School in 1946 with the aid of the Kellogg Foundation. This program consists of a year of academic study, supplemented by a year of supervised practical experience. The academic year combines specialized instruction in hospital administration and basic courses in the fundamentals of public health.

**Program in Biostatistics**—Graduate study in statistical methodology and theory for application in medical, biological, and public health research is offered by the Biostatistics Division. These curriculums prepare the student for statistical positions in the fields of medical and public health research. The Division can currently offer a number of traineeships sponsored by the National Institutes of Health. Requirements for entering a graduate program leading to the degrees of master of science and doctor of philosophy in biostatistics can be found in the *Bulletin of the Graduate School*.

**Laboratory of Physiological Hygiene**—In 1937 the Laboratory of Physiological Hygiene was established at the University as a research and teaching unit and was made a division of the School of Public Health in 1946. The Laboratory offers unusual opportunities for advanced study in the fields of nutrition, epidemiology of heart disease, gerontology, physiology of exercise, performance, and problems of metabolism. Facilities and personnel are specialized for experimental studies on man. Programs of study are available which lead to the degree of master of science or doctor of philosophy in physiology, physiological chemistry, and, in particularly well-qualified cases, physiological hygiene.

**Summer Session**—The Summer Session of the University of Minnesota consists of 2 terms, each of 5 weeks. In each of these terms certain courses are concentrated that during the regular year are spread over 1 or 2 quarters. It is not possible, however, for a student to complete the requirements for an advanced degree by attendance only at a series of summer sessions. Special workshops or intensive programs of study lasting 2 or 3 weeks are offered during the summer.

**In-Service Courses**—Noncredit, in-service courses are offered at the Center for Continuation Study through the co-operation of the School of Public Health and the Department of Continuation Medical Education. These courses vary in length from 2 days to 2 or 3 weeks and are offered to physicians, engineers, nurses, hospital administrators, educators, or other groups within the public health field. The faculty for these courses is recruited from the regular University staff, supplemented by special

lecturers. The School likewise offers several courses through the Extension Division. Credits earned through Extension courses can be transferred to count toward degrees. No professional courses are offered by correspondence.

**Training Stipends**—Under Sections 306 and 307, Public Health Service Act, funds are available through the U.S. Public Health Service to provide a limited number of stipends for students in schools of public health who are preparing for public health employment. These cover tuition and university fees, travel to the school and a generous living allowance depending upon the number of dependents and the student's academic background or the degree for which the student is studying. Section 306 provides stipends for all types of public health personnel including nurses at the prebaccalaureate level but excluding nurses working for advanced degrees. Stipends under this section are calculated on the basis of \$400 a month for students with a Doctor's degree, \$300 a month for those with a Master's degree, \$250 a month for those with a Bachelor's degree, and \$200 a month at the pre-Bachelor level. Under Section 307, stipends are available to graduate nurses in the Master's program at \$250 a month regardless of previously earned degrees. All nursing stipends are awarded directly by the School. Stipends for other students are awarded either by the School or by the Public Health Service upon recommendation of the School. Students who are interested in applying for stipends should write to the School of Public Health, 1325 Mayo Memorial, University of Minnesota, Minneapolis 14.

**Special Stipends**—In addition to the foregoing, the School has been granted special stipends by the National Institutes of Health for training in epidemiology, biostatistics, and mental health. Special stipends are also available from the U.S. Public Health Service for training in the fields of radiological health and air pollution. The amounts of such stipends vary with the field of study. Inquiries should be addressed directly to the School. Stipends for doctoral students in hospital administration have been granted for a limited time period by the W. K. Kellogg Foundation. Inquiries should be addressed to the director of the Program in Hospital Administration.

## Admission - 12

**Graduate Program**—Those who wish to become candidates for the degrees of master of public health or master of hospital administration should apply for admission to the School of Public Health. Application blanks will be furnished by the School upon request. A certified transcript attesting to the applicant's college record and his graduation must be submitted with the application. At least two letters of recommendation, supporting the application, should also be sent directly to the School from persons who are capable of assessing the ability of the candidate to do graduate work, and who can assess his past and potential success in his chosen discipline. After the application and supporting papers have been received, applicants will be notified of action taken.

Detailed admission requirements and degree requirements for the several programs are listed in the section under Programs of Study.

Candidates for the degree of doctor of philosophy or master of science should apply directly to the Graduate School.

**Special Students**—Those who do not present themselves immediately as candidates for degrees, but who wish to pursue studies centered in the School of Public Health, may be admitted as adult special students. Students from foreign countries other than Canada are always admitted as adult special students for their first quarter of residence and will be continued as such until accepted as candidates for degrees.

Credits earned as adult special students will count toward the master of public health degree when the student is transferred to degree candidacy. Adult special stu-

dents who wish to transfer to candidacy for the master of science degree should consult the *Bulletin of the Graduate School* for regulations governing such transfer. The academic record of each adult special student will be reviewed after the close of each quarter of residence to determine his eligibility for transfer to degree candidacy.

**Foreign Students**—Students from foreign countries are urged to begin their studies with the second term of the Summer Session. During this term, they will attend suitable professional classes to help them learn to understand classroom English so that they will be ready for formal instruction when classes begin in the fall quarter. The School will arrange a program of supervised field experience for the interval between Summer Session and the fall quarter.

**Transfer of Credits**—Transfer of not more than 9 credits earned at other universities may be approved for candidates for Master's degrees, but this does not shorten the minimum residency requirements of 3 academic quarters.

**Student Orientation**—Those entering during the fall quarter are eligible to take advantage of New Students' Week activities. The *Moccasin*, new students' handbook, may be secured from the Office of Admissions and Records. Students are particularly urged to attend the lectures on the library, tour of the library, and lectures on "How to Study." Students who have not been in school for several years are urged to take the course in Personal Orientation.

## Degrees and Certificates

**Doctor of Philosophy**—A program of study and research leading to the doctor of philosophy degree may be elected with a major in biostatistics, environmental health, epidemiology, hospital administration, or physiological hygiene. Entrance upon work for this degree with a major in public health will be limited to students who have already completed a Master's degree or the equivalent in public health or related fields. Those whose interest is in the field of maternal and child health should plan their work through the Department of Pediatrics of the Graduate Medical School. A major in biostatistics may be elected by those whose chief interests center in statistical theories and their application to biological fields. Similarly, a major in physiological hygiene may be elected by qualified students in that field though many such students may prefer a major in physiological chemistry or physiology. The doctoral program in hospital administration provides a joint major with one of the fields of social science.

A program of at least 3 years of study and research is required. A minimum of 3 quarters must be spent in residence at the University of Minnesota. The general requirements are set forth in the *Bulletin of the Graduate School*.

The University of Minnesota does not grant the doctor of public health degree. With the exception of the professional degrees of M.D., D.D.S., and D.V.M., it is the policy of the University of Minnesota that the only doctoral degree offered is the Ph.D., regardless of the field of specialization.

**Master of Science**—This degree is available under two plans, the one involving preparation of a thesis plus a minimum of course work, and the other embracing more extended course work and the formulation of reports in place of a thesis. A minimum of 3 quarters of study in residence at the University of Minnesota is required under each plan. Students may major in public health (concentrating upon one of the component fields), or in biostatistics, or in physiological hygiene. For detailed information, see the *Bulletin of the Graduate School*.

**Master of Public Health**—This is an advanced professional degree, granted in recognition of scholastic attainment in public health to individuals with suitable previous professional education and experience. The University of Minnesota in its require-

ments for admission to candidacy for the master of public health degree is guided by the standards established by the American Public Health Association. The following are eligible for admission:

"a. Holders of the degree of M.D., D.D.S., or D.V.M., or equivalent degree from an acceptable institution; or

"b. Holders of the Bachelor's Degree with adequate preparation in the sciences basic to public health, and also qualified in some professional capacity to pursue education in public health.

"The latter qualifications may normally be fulfilled either by

"x. professional academic qualifications in engineering, public health nursing, education, or some other field of public health representing the equivalent of at least 'one year of academic work in addition to the completion of a four years' course leading to the Bachelor's Degree;

"y. or experience (normally not less than three years) in some field of public health practice or in teaching of a type acceptable to the school."

Those who do not meet the experience requirement outlined above are advised to become candidates for the master of science degree.

All candidates for the master of public health degree must complete a program of at least 3 quarters of approved study in residence at the University of Minnesota. This must include a *minimum* of 45 credits in courses of graduate grade offered by the University. The total program of training for each candidate should include PubH 100A, B, and C, and courses in epidemiology, health education, public health administration, public health nursing, sanitation, and statistics. The courses selected must have the approval of the student's adviser. A grade average of not less than 2.75 (based on: A = 4, B = 3, C = 2, D = 1) must be attained, including a grade average of 2.5 in all public health courses so graded and no grade less than C in the foregoing required courses. Field work courses, even though required, are not counted in determining grade point averages. Papers of the quality, though not the scope, of a Master's thesis must be prepared in courses totaling 9 credits, as determined by the student's adviser. The student must also successfully pass a comprehensive examination at the end of the period of study.

**Master of Hospital Administration**—See page 26.

**Bachelor's Degree**

1. *Major in Public Health Nursing*—See page 19.

2. *Major in Biostatistics*—Registration for courses leading to the bachelor of arts degree with a major in biostatistics is in the College of Science, Literature, and the Arts (see bulletin of that college). The curriculum is of a broadly elective type and designed for a normal period of study covering 4 academic years.

### Expenses (1962-63)

(Subject to change in 1963-64)

1. Tuition fee per quarter (except for hospital administration)	
Resident (full schedule) .....	\$ 86.00
Nonresident (full schedule) .....	225.00
Resident, per credit hour .....	7.25
Nonresident, per credit hour .....	18.75
2. Tuition fee per quarter (hospital administration only)	
Resident (full schedule) .....	150.00

Nonresident (full schedule) .....	310.00
Resident, per credit hour .....	12.50
Nonresident, per credit hour .....	26.00
3. Records service fee .....	1.00
4. Incidental fee per quarter .....	20.00
5. Summer Session (1962), per term	
Tuition (more than 4 credits) .....	59.50
Incidental fee .....	11.00
6. Special course fees are charged as follows:	
PubH 169, 190 (in addition to regular tuition) .....	100.00
PubH 230 (September field course—in lieu of tuition) .....	200.00
7. Graduation fee .....	10.00

If a student receives a stipend which provides for direct payment of tuition and fees, a statement authorizing the University to submit bills for such charges should be sent to the School of Public Health in advance of registration. The tuition amounts indicated are for registration in the School of Public Health. For tuition rates for other colleges, the *Bulletin of General Information* should be consulted.

The University year, extending from October to June, is divided into 3 terms called quarters. On the specified dates (see Calendar in *Bulletin of General Information*) prior to the opening of each quarter, the following fees are due from each student: (a) tuition, (b) incidental, and (c) such special fees and deposits as may be required. Payment of fees cannot be deferred.

## Residence Accommodations

Most out-of-town students live either in University-maintained residence halls or in private rooming houses. Information concerning residence halls may be obtained from the Director of University Housing, 108 Westbrook Hall, University of Minnesota, Minneapolis 14.

Information about private rooming houses may be obtained from the Student Housing Bureau at 209 Eddy Hall.

## Further Information

For further details regarding admission, expenses, housing facilities, health service, scholarships, etc., consult the *Bulletin of General Information* which may be obtained upon request. Address: Office of Admissions and Records, University of Minnesota, Minneapolis 14.



## PROGRAMS OF STUDY - 12

### I. Program for Medical Health Officers - 14

Major Advisers: Caylord W. Anderson, Leonard M. Schuman, Stewart C. Thomson

#### Requirements for Admission - 10

1. The degree of doctor of medicine from an acceptable institution.
2. One year's experience as an intern in an approved hospital, or an acceptable substitute.

#### Plan of Instruction - 10

The course of study leading to the degree of master of public health covers a minimum of 3 academic quarters. These quarters should be taken in a single academic year and in all cases the student must plan to begin in a fall quarter. The course of study includes certain required courses supplemented by electives chosen in accordance with the student's special interests and needs. Among the courses of special interest and value are the following:

#### Recommended Courses - 9

(Credits shown in parentheses; \*\* indicates required courses)

- |  |  |
|--|--|
| PubH 100A, B, C**—Elements of Public Health (5)          | PubH 154—Control of Radiation Hazards (3)                    |
| PubH 104,** 105—Epidemiology (6)                         | PubH 155—Introduction to Air Pollution Problems (3)          |
| PubH 106,** 122—Public Health Administration (6)         | PubH 191—Science of Human Nutrition (3)                      |
| PubH 107—Maternal and Child Health (3)                   | PubH 195—Public Health Aspects of Cardiovascular Disease (3) |
| PubH 114**—Environmental Sanitation Programs (3)         | PubH 210—Seminar in Public Health (1)                        |
| PubH 125**—Public Health Education (2)                   | PubH 215—Maternal and Child Health (ar)                      |
| PubH 132—Mental Health Program (1)                       | PubH 241—Epidemiology of Noncommunicable Diseases (3)        |
| PubH 133—Mental Health (3)                               | Anth 165—Culture and Personality (3)                         |
| PubH 140**—Vital Statistics I (3)                        | Pol 131—Public Administration (3)                            |
| PubH 141—Economic and Social Aspects of Medical Care (3) |  |

See page 25 for doctoral program in epidemiology.

### 2. Programs in Environmental Health - 14

Major Advisers: Herbert M. Bosch, Richard G. Bond, Theodore A. Olson, John O. Buxell, Harry Foreman, George S. Michaelsen, Harold J. Paulus, Gustave L. Scheffler, Lee D. Stauffer

#### Master's Degree Programs - 12

#### Requirements for Admission - 10

1. A Bachelor's degree (a) in engineering, preferably civil, sanitary, chemical, or mechanical, or (b) with a major in one of the natural sciences or mathematics.

2. Adequate training in basic and applied sciences, including a basic course in bacteriology.

### Plan of Instruction

The course of instruction leading to a Master's degree ordinarily requires 4 quarters of study. Students should plan to be in attendance for the second summer term preceding the regular academic year.

This program provides training in the general field of public health and, by the use of electives, specialized training in one or more of the separate fields of environmental health. The student may concentrate his electives in water supply, sewerage, general sanitation, radiological health, air pollution, or industrial health.

### Recommended Courses

(Credits shown in parentheses; \*\* indicates required courses)

- PubH 100A,B,C\*\*—Elements of Public Health (5)  
 PubH 102\*\*—Environmental Sanitation (3)  
 PubH 104\*\*—Epidemiology I (3)  
 PubH 106\*\*—Public Health Administration (3)  
 PubH 110-111—Biostatistics I and Biostatistics Laboratory (5) (may be substituted for 140)  
 PubH 112A,B,C—Public Health Engineering: Plan Examinations (3)  
 PubH 113A,B,C—Public Health Engineering: Field Investigations (6)  
 PubH 115—Food Sanitation (3)  
 PubH 116—Public Health Engineering Administration (2)  
 PubH 117, 118, 119—Sanitary Biology (9)  
 PubH 120-121, 130-131—Biostatistics II and III (with Laboratory) (10)  
 PubH 123—Topics in Public Health (ar)  
 PubH 125\*\*—Public Health Education (2)  
 PubH 140\*\*—Vital Statistics I (3) (110 and 111, or 180 may be substituted)  
 PubH 152—Industrial Hygiene Engineering (3)  
 PubH 154—Control of Radiation Hazards (3)  
 PubH 155—Introduction to Air Pollution Problems (3)  
 PubH 156—Air Pollution Surveys and Controls (3)  
 PubH 159—Chemical Laboratory Safety (1)  
 PubH 170A\*\*—Public Health Nursing (1)  
 PubH 180—Introduction to Biostatistics (6)  
 PubH 191—Science of Human Nutrition (3)  
 PubH 200—Research (ar)  
 PubH 210—Seminar in Public Health (1)  
 PubH 212—Seminar in Public Health Engineering and Sanitation (ar)  
 PubH 230—Field Practice: Environmental Sanitation (ar)  
 Arch 104—City Planning (3)  
 Bot 112—Aquatic Flowering Plants (4)  
 CE 161—Hydrology (3)  
 CE 170—Water Supply (3)  
 CE 171—Sewerage and Sewage Treatment (3)  
 CE 172—Sanitary Laboratory (3)  
 CE 173—Sanitary Engineering Problems: Water (3)  
 CE 174—Sanitary Engineering Problems: Sewage and Industrial Wastes (3)  
 CE 175—Industrial Waste Disposal (3)  
 CE 261—Water Plant Design (3-5)  
 CE 262—Sewage Plant Design (3-5)  
 ChEn 131, 132—Chemical Reactor Analysis (6)  
 ChEn 161, 162, 163—Nuclear Reactor Design (9)  
 DyHu 109—Market Milk (3)  
 DyHu 150—Dairy Bacteriology (3)  
 DInd 102—Condensed Milk Products (3)  
 FTec 105—Frozen Food Problems (3)  
 Geog 133—Climatology (3)  
 Geog 134—Advanced Climatology (3)  
 IndE 182—Industrial Safety (3)  
 ME 146—Fuels and Combustion (3)  
 ME 160—Psychrometrics and Air Conditioning (3)  
 ME 161—Heating, Air Conditioning Design (3)  
 ME 163—Principles of Particle Technology (3)  
 ME 169—Air Conditioning and Refrigeration Laboratory (2)  
 Phys 121—Experimental Nuclear Physics (3)  
 PoHu 154—Poultry Products (5)  
 Pol 131—Public Administration (3)  
 Soc 115—Social Aspects of Housing and Standards of Living (3)  
 Zool 144—Medical Entomology (3)

## Doctoral Degree Program

### Requirements for Admission

Candidates for this degree will present, as a minimum, one of the following:

1. A Bachelor's degree in civil, chemical, or mechanical engineering.

2. A Bachelor's degree with a major in chemistry or physics and a minor in some other science. Candidates presenting this qualification must also present evidence of having satisfactorily completed at least 2 years of college mathematics.

3. A Bachelor's degree with a major in bacteriology, entomology, zoology, biochemistry, or physiology and a minor in some other science.

Before being admitted to degree candidacy, the candidate will be expected to have had collegiate work in inorganic, organic, and analytical chemistry and, preferably, work in physical chemistry. At least 6 credits of biological sciences will also be required. Candidates will be required to demonstrate a reading knowledge of 2 modern foreign languages, or of 1 foreign language and option of a special research technique or a collateral field of knowledge.

### **Plan of Instruction**

The program and course offerings are planned to prepare a select group of individuals for research, teaching, and high level administrative positions in the field of environmental health. The course work will be adapted to the needs of the individual student and will take cognizance of the several fields of specialization within environmental health. Candidacy for the Ph.D. degree implies the completion of a Master's degree or equivalent in public health or related fields. Minors will be chosen from a fundamental discipline appropriate to the student's previous academic training.

## **3. Programs for Public Health Nurses**

Major Advisers: Marion Murphy, Kathryn Fritz, Ruth von Bergen, Eleanor Anderson, Clare Blanchard, Delphie Fredlund, Marie McIntyre, Ruth Pennebaker, E. Barbara Stocking, Marilyn Facklam

### ***Graduate Programs Leading to Master of Public Health or Master of Science Degree***

#### **Requirements for Admission**

1. A baccalaureate degree from a program accredited by the National League for Nursing which prepares for professional nursing in all clinical areas including public health nursing. Individual consideration will be given to applicants whose basic nursing preparation varies from the above.

2. A grade point average of B in undergraduate course work.

3. Completion of admission tests which may be designated by the faculty.

4. Evidence of personal and professional qualifications as supplied by reference letters and, if possible, an interview.

5. Experience. Students desiring to become candidates for the master of public health degree should have experience in public health nursing (normally not less than 3 years). See page 15.

Students desiring to become candidates for the master of science degree may have less than 3 years of experience. Individual consideration will be given to recent graduates of baccalaureate programs in nursing, accredited as above, who lack employment

experience in the public health nursing field. See below, and also the *Bulletin of the Graduate School*.

### Plan of Instruction

The purpose of these programs is to prepare selected public health nurses for positions as supervisors, administrators, consultants, and teachers. Whether a nurse is admitted to the master of public health or master of science program depends upon previous experience and her professional goal in pursuing advanced study. A student's final program plan does not need to be set until late in the fall quarter. A *minimum of 4 quarters of study is required*. Five quarters are required for students who wish further preparation in the mental health area and for those interested in preparing for teaching positions. A new curriculum to prepare nurses for positions of responsibility in community programs of long-term patient care and rehabilitation is in process of development. Tentative length of this program is 5 quarters, also. Additional information is available from the School of Public Health.

See page 15 for information on required papers and the comprehensive examination which applies to all Master's level public health nursing students.

**Master of Public Health**—This is an advanced professional program in which students representing the various disciplines within the public health field pursue a common core of courses. Since public health nurses are also required to complete a block of theory and practice courses in the nursing area, the master of public health curriculum allows almost no possibility of electives. In general, nurses whose main interest is administration are advised to enter this program although others are not excluded.

#### Requirements for Nurses in Master of Public Health Curriculum

##### PUBLIC HEALTH (18 credits)

- |   |  |
|---|--|
| PubH 100A, B, C—Elements of Public Health (5) | PubH 102A—Environmental Sanitation (2) |
| PubH 104—Epidemiology I (3)                   | PubH 140—Vital Statistics I (3)        |
| PubH 106—Public Health Administration (3)     | PubH 125A—Public Health Education (1)  |
|   | PubH 210—Seminar in Public Health (1)  |

##### PUBLIC HEALTH NURSING AND OTHER (31 credits)

- |   |  |
|---|--|
| PubH 171-172—Studies in Public Health Nursing (6)                         | PubH 175-176-177—Advanced Practice in Public Health Nursing (9)      |
| PubH 173—Advanced Field Practice: Functional Area (6 or ar)               | PubH 196—Rehabilitation Nursing and Long-Term Patient Care (3 or ar) |
| PubH 174A, B—Seminar in Administration, Supervision, and Consultation (4) | Anth 165—Culture and Personality (3)                                 |

**Master of Science**—Under Plan B, the Graduate School offers the Master's student opportunity to include work in related fields in addition to the major area of public health. Public health nurses who wish to prepare for positions in teaching should follow the master of science plan. Interested nurses may write to the School of Public Health for information and later apply to the Graduate School for admission. Applications are reviewed by appropriate faculty members in the School of Public Health and recommendations made to the dean of the Graduate School. See *Bulletin of the Graduate School*.

#### Requirements for Nurses in Master of Science Sequence

Nurses in the master of science sequence must enroll for PubH 100A, B, C, for a course in statistics, and for the "Public Health Nursing and other" courses listed above. Under Plan B there is also provision for work in related fields such as nursing education, higher education, or certain other areas. Further information concerning selection of courses in related fields is available from the School of Public Health.

*Extended Program with Further Application of Mental Health Concepts in Field Practice*

Students may pursue either the master of public health or master of science sequence during the first 3 quarters on campus. The remaining 2 quarters are devoted to field experience in Rochester, Minnesota, under the supervision of the co-ordinator of the mental health program.

The purpose of the 2 additional quarters of study is to allow students opportunity to apply previous learnings in a field setting as well as to increase knowledge and skill. Special emphasis is placed on behavioral and mental health concepts so that students may be able to utilize these creatively in a functional area such as supervision, administration, consultation, or teaching.

During the field period, each student works intensively with 5 or 6 patients from a public health nursing caseload. The visits are discussed in group and individual conferences with the public health nurse co-ordinator of the program. Experience in working with mentally ill patients in and recently discharged from the Rochester State Hospital is supervised primarily by hospital personnel. In addition, individualized experiences, such as working with children in a nursery school, may be arranged.

**Traineeships—Master's Level**

Students who are preparing on a Master's level for leadership positions in public health nursing are eligible to apply for federal training funds under Section 307, Public Health Service Act (Professional Nurse Traineeship Program). A student interested in the extended mental health sequence may apply for a traineeship under the National Institute of Mental Health of the National Institutes of Health.

In the case of either type of traineeship, students make application to the School of Public Health. No action is taken by the faculty until all admission materials have been processed and eligibility for admission to the program determined. Selection will be based upon individual credentials, considering such factors as demonstrated or potential leadership ability, academic and experience backgrounds, and references.

***Bachelor of Science Degree***

Beginning with the fall quarter, 1962, no *new* students will be admitted to this program. Registered nurses with interest in further collegiate preparation for nursing, including preparation for the public health nursing field, are referred to the new general nursing program in the School of Nursing. The new program, leading to the degree of bachelor of science in nursing, is designed to prepare the registered nurse for professional nursing practice in first-level positions in hospitals, public health agencies, and other settings, such as schools and industry, where the services of professional nurses are required. See the *Bulletin of the School of Nursing* for further information.

The existing baccalaureate program in the School of Public Health, leading to a bachelor of science with major emphasis in public health nursing, will continue to be available to students who were admitted prior to the fall quarter, 1962, and to transfer students with a substantial amount of advanced standing credit who could complete degree requirements by August, 1964. Students, matriculated in the undergraduate program in the School of Public Health, who do not complete degree requirements by August, 1964, will be referred to the general nursing program in the School of Nursing, where they will be expected to meet current requirements for that curriculum.

### Plan of Instruction for Currently Matriculated Students

The undergraduate program in the School of Public Health prepares qualified registered nurses to become professional practitioners of nursing in official or voluntary public health agencies and in school nursing services which provide nursing supervision for beginning staff.

The School believes that any baccalaureate degree in nursing should represent such breadth and depth of preparation that its graduates are able to demonstrate a high quality of nursing care in any situation. Toward this end, senior students have a laboratory experience in a chronic disease hospital unit under faculty guidance with emphasis on rehabilitation and the care of long-term patients. Cultural electives, such as humanities or language courses, offer opportunity for the student to broaden her background. The baccalaureate program provides foundation for advanced study in specialized areas of nursing.

A total of 180 credits in approved courses is required for the Bachelor's degree. Since the usual amount of advanced standing for a diploma nursing program is 45 blanket credits, the total time involved for the nurse with no previous college work is 8-9 quarters. The usual full-time course load is 15 credits per quarter, but this must be reduced if the student is working part time. Students are expected to follow a planned sequence, completing Lower Division general academic requirements in advance of professional course work. It is possible to continue with a few Upper Division general elective courses in addition to the major.

The student must maintain a satisfactory academic standing and may not graduate with less than a 2.0 grade point average in all course work as well as a 2.5 (C+) average in the major sequence. For every 5 grade points in excess of 2 grade points per credit (A = 4, B = 3, C = 2, D = 1), the credit hours required for graduation are diminished by 1, but the student must complete all required courses.

In assigning course credits, it is assumed that the average student will spend 3 hours per week for each credit. As an example, a 3-credit course might have 3 hours of lecture per week; it would be assumed that the student would spend another 6 hours per week in reading and other preparation. Laboratory courses which require more hours have a corresponding decrease in the amount of outside preparation.

**Residence and Time Requirements**—At least 3 quarters in residence at the University are required and at least 2 of these must be in the senior year. The faculty reserves the right to extend the period of required residence in certain cases where there has been considerable interruption in students' programs making the educational outcome questionable. All courses in the major sequence must be taken at the University of Minnesota and, if more than 5 years have elapsed since completion of a professional course, repetition may be required. *All students presently matriculated as candidates for the bachelor of science degree must complete total requirements by August, 1964.*

**Preparation for School Nursing**—A student with special interest in this field of public health nursing must meet the same requirements and enroll for the baccalaureate program as outlined. In addition, she is responsible for selecting, with guidance from her adviser, courses in education (usually 6-9 credit hours) which will enhance her understanding of the school setting and assist her in functioning as a member of the school community. A group of education courses applicable for this purpose has been cleared with the College of Education and senior students from the School of Public Health are admitted to them. Such courses usually satisfy special certification requirements for school nursing positions which exist in certain states.

**Supplementary Preparation in Public Health Nursing for Nurses with a Previous Baccalaureate Degree**—Graduates of certain basic collegiate programs in nursing which lacked accreditation for the public health nursing field may complete such

preparation at the School of Public Health through enrollment as special students. After review of previous transcripts, supplemental course work is planned on an individualized basis. Such preparation might involve 1 to 3 quarters. A nurse with a baccalaureate degree whose nursing preparation was in a diploma school is also admitted as a special student. In such cases, a supplemental program is planned individually so as to approximate the baccalaureate program for nurses in the School of Public Health.

All supplementary students make application to the School of Public Health via the Office of Admissions and Records. Depending upon individual qualifications, supplementary students are eligible for federal training assistance under Section 306, Public Health Service Act.

**Summer Session Program for Special Students**—Special students who were enrolled in a Summer Session prior to 1962 may continue with the planned sequence providing that such course work is completed before 1964. Since new students were not admitted to the special summer program in 1962, this allows former students sufficient time to complete their work. Students in this group are advised to notify the School of Public Health concerning plans for completion.

### Requirements for Bachelor of Science Degree

(Credits shown in parentheses)

#### GENERAL REQUIREMENTS

English—The required sequence will depend upon results of the English Placement Test which should be taken prior to or during the first quarter (12-15)  
 Spch 5—Fundamentals of Speech (5)  
 (or) Spch 1-2—Fundamentals of Speech (6)  
 MicB 53—General Microbiology (5)  
 Phsl 4—Human Physiology (4)  
 Psy 1-2—General Psychology (6)  
 CD 80—Child Psychology (3)  
 Soc 1—Introduction to Sociology (3)  
 Soc 3—Social Problems (3)  
 Soc 50—Theory, Practice of Social Work (5)  
 Anth 1A—Introduction to Anthropology (5)  
 (or) Anth 2A—Introduction to World Ethnology (5)  
 Pol 1-2—American Government and Politics (6)  
 (or) Pol 5—American Government and Politics (5)  
 (or) Pol 25—World Politics (3)  
 Education elective (3-9)

#### MAJOR SEQUENCE

PubH 53—Introduction to Public Health (5)  
 PubH 58—Health Programs for Mothers and Children (5)  
 PubH 63—Public Health Nursing (2)  
 PubH 64—Long-Term Patient Care (6)  
 PubH 65—Field Practice in Public Health Nursing (ar)  
 PubH 75—Introduction to Environmental Sanitation (3)  
 PubH 95—Human Nutrition (3)  
 (or) HE 76—Nutrition of the Family (4)  
 PubH 133—Mental Health (3)  
 Ed 81—Introduction to Education for Public Health Nurses (3)  
 NuEd 69—Survey of Conditions and Trends in Nursing (3)  
 NuAd 170—Foundations of Nursing Service Administration (3)  
 General electives to be selected with guidance from adviser (12-26)  
 Usual advanced standing for 3-year nursing program (45)  
 Total credits required for degree (180)

### Traineeships

Students may apply for training assistance under Section 306, Public Health Service Act (formerly Title I, Health Amendments Act of 1956) during enrollment in the major sequence which prepares for the practice of public health nursing, normally 3 quarters during the senior year. Preference is given to nurses under 35 years of age who are new to the field of public health or those with less than 2 years of experience in this field. Selection of candidates is based upon general aptitudes, references, availability for employment without geographic restriction, and expectation of working in the public health nursing field for at least 2 years following receipt of training funds.

## 4. Programs for Health Educators

Major Adviser: Ruth E. Grout

### Requirements for Admission

1. Bachelor's degree from an acceptable institution.
2. Satisfactory background in (a) basic health sciences, (b) education, and (c) social sciences.

### Plan of Instruction

**One-Year Program**—The regular program of study leading to the master of public health degree covers at least 4 academic quarters, 1 of which is devoted to field work in an approved training center. This program is normally limited to those persons having not less than 3 years of professional public health or related experience prior to entry into the program.

**Two-Year Program**—This program is open to students who have just completed their Bachelor's degree, or to other qualified students who lack adequate professional experience in health education. Completion of the program leads to the master of public health degree. It consists of 2 quarters of academic study, followed by 9 months of supervised field work in an approved agency, and ends with 2 additional quarters of academic work on campus.

### Recommended Courses

(Credits shown in parentheses; \*\* indicates required courses)

PubH 100A, B, C**—Elements of Public Health (5)	PubH 181-182-183**—Principles and Methods in Public Health Education (9)
PubH 102A**—Environmental Sanitation (2)	PubH 190**—Field Work in Public Health Education (ar)
PubH 104**—Epidemiology I (3)	PubH 210—Seminar in Public Health (1)
PubH 106**—Public Health Administration (3)	PubH 227—Problems in Public Health Education (ar)
PubH 107A—Maternal and Child Health Program (1)	EdCI 217—Seminar in School Health Education (3)
PubH 133—Mental Health (3)	
PubH 140**—Vital Statistics (3)	
PubH 170**—Seminar in Public Health Nursing (2)	

### Elective Courses

PubH 95—Human Nutrition (3)	Jour 130—Public Opinion, Propaganda (3)
Anth 151—Applied Anthropology (3)	Soc 120—Social Psychology (3)
Anth 164—Social Anthropology (3)	Soc 153—Sociology of Leadership, Group Action (3)
Anth 165—Culture, Personality (3)	Soc 161—Rural Community Analysis (3)
EdCI 105—Audio-Visual Materials in Education (3)	Soc 162—Rural Social Institutions (3)
EdCI 215—Problems in School Health Education (ar)	Soc 180—Methods of Social Research (3)
EdCI 252—Effective College Teaching (3)	SW 274—Seminar: Community Organization (ar)
EPsy 193—Psychology of Human Learning (3)	SW 275—Social Group Work (3)
Jour 115—Communications Analysis: Content, Audiences, Effects (3)	



## 5. Program for Public Health Veterinarians

Major Advisers: Gaylord W. Anderson and Robert K. Anderson

This program is offered in co-operation with the College of Veterinary Medicine located on the University's St. Paul Campus.

### Requirements for Admission

1. Degree of doctor of veterinary medicine from an acceptable institution.
2. One year of experience in veterinary medicine is desirable.

### Plan of Instruction

This course of instruction, leading to a master of public health degree, ordinarily requires 4 quarters of study. Students should plan to be in attendance for the second summer term preceding the regular academic year.

The program of study includes certain required public health courses, supplemented by electives chosen in accordance with the veterinarian's special interests and individual needs. Among the courses of special interest and value are the following:

### Recommended Courses

(Credits shown in parentheses; \* indicates required courses)

PubH 100A, B, C**—Elements of Public Health (5)	VBac 128—Problems in Veterinary Bacteriology and Public Health (3)
PubH 103—Public Health Bacteriology (3)	VBac 205—Advanced Veterinary Bacteriology (3)
PubH 104,* 105—Epidemiology I and II (6)	VBac 221*—Advanced Veterinary Public Health (ar)
PubH 106,* 122—Public Health Administration (6)	VPaP 202—Seminar in Pathology (1)
PubH 114**—Environmental Sanitation Programs (3)	VPaP 240—Advanced Veterinary Parasitology (3)
PubH 115—Food Sanitation (3)	VSR 219—Fundamentals of Nuclear Medicine (3)
PubH 125*—Public Health Education (2)	VSR 235—Radiation Biology (3)
PubH 140*—Vital Statistics (3) (108 or 110 and 111 may be substituted)	MicB 116*—Immunology (4)
PubH 154—Control of Radiation Hazards (3)	MicB 124—Virology and Animal Cell Culture (3)
PubH 155—Introduction to Air Pollution Problems (3)	FTec 101, 102—Food Technology (6)
PubH 170A*—Public Health Nursing (1)	DInd 113—Technical Control of Dairy Products (3)
PubH 210—Seminar in Public Health (1)	DInd 151—Advanced Dairy Bacteriology (3)
PubH 213—Seminar in Epidemiology (ar)	Pol 131—Public Administration (3)
PubH 241—Epidemiology of Noncommunicable Diseases (3)	

## 6. Program in Epidemiology

Major Advisers: Leonard M. Schuman and Gaylord W. Anderson

### Requirements for Admission

Specialized training in epidemiology is offered to qualified graduates in medicine, dentistry, and veterinary medicine. Other students with adequate background in biological or physical sciences or with demonstrated competence in investigative work may be admitted. Since positions in the program are relatively limited, selection of

candidates is competitive with respect to background of instruction and experience presented.

### Plan of Instruction

The advanced training program in epidemiology is designed to develop students' proficiency in epidemiologic investigation suitable for careers in service, research and teaching in health agencies and institutions. It includes instruction in scheduled courses with latitude in electives suitable to the student's background, interests, and needs. This is supplemented with participation in on-going field research designed to provide increasingly complex experiences commensurate with the student's growth in proficiency.

Length of training may be as long as 5 years, dependent upon the student's background. Candidates for the Ph.D. degree must plan to spend a minimum of 3 years of study and research. Such candidates will offer a minor in a field related to their background, interests, and special goals. The satisfactory completion of original research is a prerequisite for the Ph.D. degree. The acquisition of an M.P.H. degree during the course of study, or its presentation on admission, is highly desirable but not mandatory.

## 7. Programs for Hospital Administrators

Major Advisers: James A. Hamilton, James W. Stephan, Edith M. Lentz

### *Master's Degree Program in Hospital Administration*

#### Requirements for Admission

1. Bachelor's degree as attested by certified transcript (submit two copies) of applicant's college record.
2. Course in elements and principles of accounting (6 quarter hours or equivalent). May be taken during Summer Session prior to start of academic year.
3. Letter indicating applicant's previous work experience and reasons for selecting hospital administration.
4. Names of three references (preferably connected with hospital, health, or medical field, and work experience).
5. Personal interview by person designated by the University.

Resources limit the number of students who can be accepted. Experience in hospital administration is valuable but not essential and does not in any way shorten the period of study. Only full-time students will be accepted as degree candidates. All correspondence regarding this program should be directed to Director, Program in Hospital Administration, School of Public Health, University of Minnesota, Minneapolis 14.

#### Plan of Instruction

The objective of this program is to prepare the individual to assume, after requisite years of practical experience in responsible supervisory and managerial positions, the chief executive status of administrator or director of a hospital. This program leads to the degree of master of hospital administration. The program is of approximately

21 months' duration, including 1 academic year of 3 quarters in full-time residence, and 1 calendar year of supervised administrative residency. The residency is under University supervision and the faculty guides the student in the selection of the residency. During the residency the student must prepare and submit a research thesis. The curriculum draws upon other University facilities and upon facilities provided by hospitals within the region adjacent to the University. The program of study provides a central group of subjects pertaining directly to hospital operation and administration, with supplementary instruction in related fields including public health and medical care. All students must complete 60 credit hours of graduate work and maintain an average of not less than 2.5 (based on A = 4).

The following program of courses will be followed:

(Credits shown in parentheses)

**FIRST YEAR**

- PubH 100A, B, C—Elements of Public Health (5)
- PubH 106—Public Health Administration (3)
- PubH 107A—Maternal and Child Health Program (1)
- PubH 108—Introduction to Biostatistics and Statistical Decision (2)
- PubH 109—Institutional Sanitation (3)
- PubH 125A—Public Health Education (1)
- PubH 141—Social and Economic Aspects of Medical Care (3)
- PubH 160—Principles of Administration in Hospitals (6)

- PubH 161—History and Development of Hospitals (3)
- PubH 162-163-164—Principles of Organization and Management of Hospitals (15)
- PubH 166—Hospital Clerkship (5)
- PubH 167—Management Problems in Hospital Administration (6)
- PubH 168—Orientation to Medical Sciences (3)
- PubH 170A—Public Health Nursing (1)
- PubH 210—Seminar in Public Health (1)
- Spch 106—Discussion (3)

**SECOND YEAR**

- PubH 169—Administrative Residency (12)

***Doctoral Program in Hospital Administration***

**Requirements for Admission**

1. Bachelor's degree from an acceptable institution, preferably with breadth in the social sciences, mathematics, and administration.
2. A Master's degree, with a major in hospital administration, will serve as a first step in acquiring the Ph.D.
3. Evidence of marked academic ability and potential for independent work and research.
4. Letter indicating applicant's reasons for seeking advanced education.
5. Names of three references attesting to scholarship, personality, and fitness for teaching or research career.
6. Acceptable score on the Miller Analogies Test, graduate level.

**Plan of Instruction**

The objective of this program is to produce scholars who plan to pursue academic careers as teachers or research workers in the field of hospital administration. It is interdepartmental in nature, programs being submitted to the Graduate School's Social Science Graduate Group Committee. Each student's work will be done under a dual advisership, the first adviser being from hospital administration faculty and the second from the field of his second major or his minor subject such as anthropology, business administration, economics, political science, psychology, or sociology.

Each student will have opportunity to (1) expand his knowledge of the inter-relationships of major social institutions and of the dynamics of health care patterns

here and abroad; (2) analyze changing health needs and alternative care patterns within the professions and agencies meeting such needs; (3) gain through his minor program a depth of knowledge in one of the closely related disciplines, and to relate the concepts of that field to the problems of hospital administration; and (4) acquire an understanding of the theory of research and its present status in the health field, as well as to develop research skills through supervised experience in research design and performance.

Each student is required to demonstrate, by the end of his academic work, a reading knowledge of at least one foreign language. His course work will include, in addition to required courses in hospital administration, at least 1 course in research theory and methods beyond that taken during a Master's degree program, 2 or more courses in business administration, and 2 or more courses in public administration as approved by his major adviser. He is expected to do collateral study in the area of public health. The program will require a minimum of 2 years of academic courses, 2 summers of supervised research, and a dissertation dealing with a significant problem concerning health care services and the role and function of the hospital.

## 8. Programs in Physiological Hygiene

Major Adviser: Ancel Keys

### Requirements for Admission

1. Bachelor's degree from an acceptable institution.
2. Evidences of satisfactory background in at least three of the following fields: biochemistry, physiology, psychology, physical education, physical anthropology, medicine, public health.
3. Acceptance of advisory responsibility by one of the graduate faculty members.

### Plan and Program of Study

In general, students wishing to emphasize work in physiological hygiene on a program leading to an advanced degree are advised to do so in connection with a major in physiology, physiological hygiene, or epidemiology. The course of study leading to the Master's degree covers at least 3 academic quarters but in most cases should be planned to cover at least a full calendar year. A large part of 2 or more quarters will ordinarily be required for thesis work. The actual program will be adjusted to the individual needs of the student but will be arranged with emphasis on either physiology or biochemistry. In general, the following courses, or their equivalents, will be required for the Master's degree.

### Required Courses

(Credits shown in parentheses)

- |   |  |
|---|--|
| PubH 100A, B, C—Elements of Public Health (5)       | PubH 192—Physiology of Exercise (2)  |
| PubH 110—Biostatistics I (3)                        | PubH 195—Public Health Aspects of Cardiovascular Disease (3)                     |
| PubH 111—Biostatistics Laboratory (2)               | PubH 290—Research in Physiological Hygiene and Related Areas (6)                 |
| PubH 152—Industrial Hygiene Engineering (3)         | Phsl 106—Human Physiology (15)   |
| PubH 154—Control of Radiation Hazards (3)           | Physiological chemistry or agricultural biochemistry, graduate level courses (7) |
| PubH 155—Introduction to Air Pollution Problems (3) |  |
| PubH 191—Human Nutrition (3)                        |  |

## 9. Program for Vital Statisticians

Major Advisers: Jacob E. Bearman, Richard B. McHugh, I. Richard Savage,  
Byron W. Brown, Jr.

### Requirements for Admission

1. Bachelor's degree from an approved institution.
2. Broad training in natural sciences, particularly in biology.
3. Evidence of aptitude for quantitative reasoning.

### Plan of Instruction

The program leading to the master of public health degree must include basic courses in public health, supplemented by advanced courses in statistics and such other studies as seem best suited to give the student a well-balanced background for work in vital statistics. Study of procedures in state and city offices for vital statistics will be arranged as needed.

### Recommended Courses

(Credits shown in parentheses; \*\* indicates required courses)

PubH 100A, B, C**—Elements of Public Health (5)	PubH 168—Orientation to Medical Sciences (3)
PubH 102A**—Environmental Sanitation (2)	PubH 170**—Seminar in Public Health Nursing (2)
PubH 104**-105—Epidemiology I and II (6)	PubH 210—Seminar in Public Health (1)
PubH 106**—Public Health Administration (3)	Jour 150—Public Relations in Community Services (2)
PubH 110, 111—Biostatistics I and Biostatistics Laboratory (5)	Math 121-122-123—Mathematical Theory of Statistics (9)
PubH 120-121, 130-131—Biostatistics II and III (with Laboratory) (10)	Pol 131—Public Administration (3)
PubH 125**—Public Health Education (2)	Psy 299—Tabulating Equipment Laboratory (1)
PubH 140,** 150—Vital Statistics (6)	Soc 111—Population Trends (3)
PubH 141—Social and Economic Aspects of Medical Care (3)	Soc 112—World Population Problems (3)

## DESCRIPTION OF COURSES

**Course Numbering**—A course is designated by a prefix (departmental abbreviation) and number, and sometimes a letter. It will have the same number regardless of the quarter in which it is offered.

The course number, unless otherwise noted, indicates class standing requirements as follows: 1 to 49 for freshmen and sophomores; 50 to 99 for juniors and seniors; 100 to 199 for juniors, seniors, and graduate students; 200 and over, graduate students only.

A course sequence separated by hyphens (1-2-3) must be taken *in the order listed* unless there is a † mark indicating that a student may enter the sequence in any quarter.

**Room Schedules**—These will be posted at the School of Public Health office.

**Symbols**—The following symbols are used throughout the course descriptions and will carry no page footnotes:

- § No credit is given if credit has been received for equivalent course listed after section mark.
- ¶ Means "concurrent registration in" (i.e., must be taken simultaneously).
- ‡ A sharp sign means "consent of instructor."

**Abbreviations**—The following abbreviations are used throughout the course descriptions:

Ar	To be arranged or assigned	Lect	Lecture
Avg	Average	Prereq	Prerequisite
Cr	Credits	Qtr	Quarter
Equiv	Equivalent	Rec	Recitation
Lab	Laboratory		

A parenthetical statement after the description of each course gives the following information: the number of credits the course carries, and the courses or special class standing prerequisite to it. *Abbreviated statement:* (5 cr; prereq sr, 6). *Expanded statement:* This course carries 5 credits, is open to seniors or above only, and has as prerequisite course 6 in the same department as the course being described.

### Public Health (PubH)

- 2.\*\* **Personal and Public Health.** Individual and community activities for promotion of health and safety. (2 cr, §3, §50) Reiter
- 3.\*\* **Personal Health.** Normal body function; causes and prevention of disease. (2 cr, §2, §50) Thomson
- 4.\*\* **Health Problems of the Community.** Prevention of disease in family and community. (2 cr; not open to students exempted from 2, 3, 3A or 3B on basis of military service; prereq 3, 3A) Thomson
- 5.\*\* **Individual and Public Health.** Basic concept of cause and prevention of disease in family and community. (3 cr, §2, §3, §3A, §3B, §4, §50, §51) Thomson
- 50.\*\* **Personal and Community Health.** Fundamental principles of health conservation and disease prevention. (3 cr, §2, §3, §3A, §3B, §4, §5, §51, §52) Thomson

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\*\* No credit is granted for this course in major sequence in public health nursing curriculum.

- 51.\*\* **Community Hygiene.** Community programs for disease control. (3 cr, §4, §5, §50, §100; not open to students exempted from 3 on basis of military service; prereq 3, 3A) Stauffer
- 52.\*\* **Home Nursing and Family Care.** Nursing care and observation of patient; equipment of sick room; care of mother and baby. (1 cr; prereq home economics students, 50 or #) Simons
53. **Introduction to Public Health.** Basic concepts of disease prevention and control through community programs. (5 cr; prereq nurses or nursing students only, 3 or 50 or equiv and a course in bacteriology) G Anderson, Thomson, Schuman
- 57.\*\* **Health of Infant and Child.** Maternal health; child health including growth and development of child, care of infants and preschool children, accident prevention. (2 cr; prereq 4, or 50, or 51, or 52) Stocking
58. **Health Programs for Mothers and Children.** Health problems of mothers and of children, birth through school age; handicapping conditions; community organization including school health programs; nursing functions. (5 cr; prereq nurses, 53, 133 or ¶53, ¶153) Stocking, Fredlund, Hall
63. **Public Health Nursing.** Changing role of public health nurse in control of tuberculosis and other communicable diseases; orientation to occupational nursing; staff nurse contribution to agency planning. (2 cr; prereq 53, 58, 133, 65, or #) Murphy
64. **Long-Term Patient Care.** Field experience and seminar; assignment to chronic disease unit in hospital under supervision of faculty; rehabilitation techniques; application to public health nursing situations. (6 cr; prereq nurses, 53, 58, 95, 133, Soc 50) E Anderson and associates
65. **Field Practice in Public Health Nursing.** (Same as Nurs 87) Instruction and supervised experience in public health nursing in selected public health agencies. (Cr ar; prereq 53, 58, 95, 133, Soc 50, C avg) K Fritz and staff
75. **Introduction to Environmental Sanitation.** Principles of urban and rural sanitation relating to water, food, wastes, housing, accidents, radiation, air, insects, rodents. (3 cr; prereq 3 or in public health) Bond
76. **Introduction to Public Health for Dental Students.** (1 cr; fr, soph, jr dental students only) Jordan
77. **Dental Public Health.** Application of public health measures to field of dentistry. (2 cr; prereq sr dental students only, 76) Jordan
90. **Medical Statistics I.** Frequency proportions and probability; rates, measured variables; chance variation and judgment of significance; association. (3 cr; prereq medical students, # for others) Bearman, Thornton
- 91.†† **Physiological Hygiene.** Basic physiological principles and facts. (4 cr; prereq 8 cr in chemistry and 4 cr in human anatomy or equiv) Taylor
- 92.†† **Physiological Hygiene.** Effects of exercise, nutrition, environment, and age on performance and health. (4 cr; primarily for students in physical education and public health; prereq 91 or equiv) Taylor
95. **Human Nutrition.** Nutritional values of foods, food utilization and requirements, food management, nutrition education, application to public health. (3 cr; prereq courses in chemistry and biology, or #) J Anderson, Stief
100. **Elements of Preventive Medicine and Public Health.** Occurrence and prevention of communicable, degenerative, and industrial diseases; protection of food, water, and milk; maternal and child health. (6 cr; prereq medical students only) G Anderson, Thomson, Schuman
- 100A. **Elements of Public Health I.** Occurrence and prevention of communicable, degenerative, and industrial diseases; protection of food, water, and milk; maternal and

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\*\* No credit is granted for this course in major sequence in public health nursing curriculum.

†† Both 91 and 92 must be completed to receive credit except with special permission of instructor.

- child health. (3 cr; prereq 3, 3A, or 50 and a course in bacteriology) G Anderson, Thomson, Schuman
- 100B. Elements of Public Health II.** Group work in evaluation and solution of representative community health problems. (1 cr; prereq 100A)
- 100C. Elements of Public Health III.** Continuation of group work in evaluation and solution of representative community health problems. (1 cr; prereq 100B)
- 101. Public Health Administration and Field Work.** Field trips to acquaint students with community health programs. (2 cr; prereq sr medical students only) Thomson
- 102. Environmental Sanitation.** Methods for promoting man's health and comfort by controlling environment. (3 cr; prereq sr, 100A or ¶100A and #) Bosch, Olson
- 102A. Environmental Sanitation.** General principles of urban and rural sanitation; problems encountered by official health agencies. (2 cr; prereq 100A or ¶100A and #) Bosch, others
- 103. Public Health Bacteriology.** Bacteriologic and serologic diagnosis, public health laboratory administration and methods. (Cr ar; prereq grad, MicB 101-102, 116 and #) Bauer
- 104. Epidemiology I.** Basic epidemiologic principles applicable to infectious and noninfectious disease; host-agent-environment complex; factors underlying spread of infectious disease; laboratory applications of statistical and epidemiologic methods. (3 cr; prereq 100A, 140 or 110-111) Schuman
- 105. Epidemiology II.** Extension of epidemiologic principles to detailed study of selected diseases. (3 cr; prereq 104) Schuman
- 106. Public Health Administration.** Structure, basic functions, and activities of public health agencies. (3 cr; prereq 100A) G Anderson, Hamilton
- 107. Maternal and Child Health.** Health needs and services for mothers and children in public health programs. (3 cr, §107A; prereq physicians, dentists, and nurses, or #, ¶100A)
- 107A. Maternal and Child Health Program.** Community programs for major maternal and child health problems. (1 cr, §107; prereq 106 or #)
- 108. Introduction to Biostatistics and Statistical Decision.** Variation, frequency distribution; probability; significance tests; estimation; trends. Statistical approach to rational administrative decision making. Lectures and laboratory exercises. (2 cr) Bearman, Weckwerth
- 109. Institutional Sanitation.** Sanitation practices in hospitals and other institutions. (3 cr; prereq hospital administrators or #, 100A) Bosch, Bond
- 110. Biostatistics I.** Role of statistics in research; estimation; sampling distribution; tests of significance; power; regression; correlation; other measures of association; standard distributions including normal,  $t$ ,  $\chi^2$ ,  $F$ , binomial, Poisson; special distributions arising from nonparametric procedures. (3 cr; prereq ¶111, Math 10 or #) Brown, Bearman
- 111. Biostatistics Laboratory.** Presentation of data; descriptive statistics; practice in practical application of principles and methods covered in 110. (2 cr; prereq ¶110) Briese, Loewenson
- 112. Public Health Engineering: Plan Examinations.** (Prereq engineering degree and 102 and #)
- 112A. Water supplies. (1 cr, §114) Bosch
- 112B. Waste disposal systems. (1 cr, §114) Bosch
- 112C. Swimming pools and plumbing. (1 cr, §114) Bosch
- 113. Public Health Engineering: Field Investigations.** (Prereq engineering degree and 102 and #)
- 113A. Water supplies. (2 cr, §114) Bosch



- 113B. Waste disposal. (2 cr, §114) Bosch
- 113C. Swimming pools and plumbing. (2 cr, §114) Bosch
114. **Environmental Sanitation Programs.** Public health supervision of activities in urban and rural sanitation. (3 cr, §112, §113, or §116; #) Bosch
115. **Food Sanitation.** A review of current literature on sanitary problems in production, processing, and distribution of milk, meat, shellfish, and other foods; methods of public health supervision. (3 cr; prereq 100A and #) Olson
116. **Public Health Engineering Administration.** Administrative organization of environmental sanitation activities. (2 cr, §114; prereq #) Bosch
- 117-118-119. **Sanitary Biology.** Plant and animal forms important in environmental sanitation with special reference to disease vectors. (3 cr per qtr; prereq 100A or §100A or #) Olson
120. **Biostatistics II.** Continuation of 110. (3 cr; prereq 110 with grade not lower than C, §121) Bearman, Brown
121. **Biostatistics Laboratory II.** Practice in application of principles and methods covered in 120. (2 cr; prereq §120) Briese, Loewenson
122. **Public Health Administration Problems.** Budgeting; program planning; appraisal of public health procedures. (3 cr; prereq 106) G Anderson
123. **Topics in Public Health.** Selected readings in public health with discussion based on these readings. (Cr ar; prereq #) Staff
124. **Medical Statistics II.** Selected statistical techniques in continuation of course 90, including analysis of data resulting from follow-up studies. (2 cr; prereq 90 or #; offered when demand warrants) Staff
125. **Public Health Education.** Planning educational aspects of community health programs; group procedures; public relations; selection, development, and use of mass media. (2 cr; prereq #) Grout
- 125A. **Public Health Education.** Purposes; scope; methods and materials; planning, with special emphasis on hospitals. (1 cr; hospital administrators or #) Grout
127. **Occupational Health Programs: Nursing Aspects.** Organization and administration of nursing service in industrial health programs. (1 cr; prereq #)
130. **Biostatistics III.** Principles and methods of analysis of components of variance and effects in surveys and experiments; 1-way, 2-way, and higher nested, crossed, or mixed classifications; simple and multiple analysis of covariance. (3 cr; prereq 120 with grade not lower than C, §131) Brown, Bearman
131. **Biostatistics Laboratory III.** Practical exercises associated with 130. (2 cr; prereq §130) Briese, Loewenson
132. **Mental Health Program.** Community program for promotion of mental health and care of mentally ill persons. (1 cr; prereq 106 or #) Williams
133. **Mental Health.** Emotional factors underlying wholesome family relations or interfering with successful adjustment in family and community. (3 cr; prereq #) K Fritz, Williams
135. **Conservation of Hearing.** Detection, prevention, and amelioration of hearing impairments. (1 cr; prereq #) Boies and Associates
137. **Dental Health.** Conditions resulting in tooth decay and loss; preventive and corrective measures; mouth hygiene; community programs for dental health. (1 cr; prereq #) Jordan
139. **Advanced Field Practice in Public Health Nursing: Block Placement.** Opportunity for concentration of public health nursing field practice under supervision of coordinator of mental health program. (Cr ar; prereq #) von Bergen
140. **Vital Statistics I.** Official sources; population changes; rates; trends; significant differences. (3 cr) Thornton, Bearman

141. **Social and Economic Aspects of Medical Care.** Social and economic forces affecting administration and financing of medical care; sickness insurance, group hospitalization; concern of government in provision of medical care. (3 cr; prereq #) Ar
142. **Medical Economics.** Economic problems of medical and hospital care for community; programs for medical care and health and hospital insurance. (2 cr; sr medical students only) Ar
150. **Vital Statistics II.** Life table techniques and follow-up studies. Elementary life table techniques: follow-up study techniques; survivorship curves; problem of bias and selection connected with retrospective studies. (3 cr; prereq #) Staff
152. **Industrial Hygiene Engineering.** Field and laboratory methods used by industrial hygiene engineers in study and control of occupational health hazards. (3 cr; prereq #) Michaelsen
153. **The Hospital and the Community.** Functions and classifications of hospitals; organization and relation to health care and to public health agencies. (1 cr; prereq #) Stephan, Hamilton
154. **Radiological Health I.** Orientation in radiation effects and study and control of radiation hazards in laboratories, hospitals, and industrial plants. (Cr ar; prereq #) Foreman
155. **Introduction to Air Pollution Problems.** Introduction to public health problems associated with air pollution. (3 cr; prereq #) Paulus
156. **Air Pollution Surveys.** Public Health engineering phases of air pollution surveys. (2 cr; prereq 155 and #) Paulus
159. **Chemical Laboratory Safety.** Principles of accident and fire prevention in chemical laboratories. (1 cr; prereq #) Scheffler
160. **Principles of Administration in Hospitals.** Lectures, seminars, and field trips in hospital administrative principles; top management and board of trustees, personnel policy formation, human relations. (6 cr) Hamilton, Stephan, Lentz
161. **History and Development of Hospitals.** Functions; ownership and control; promoting and building new hospitals; integrated service; national associations and foundations. (3 cr) Hamilton, Stephan, Kincaid, Dunn
- 162-163. **Principles of Organization and Management of Hospitals.** Departmental structures and functions; organizational principles and practice. (3 cr [f], 6 cr [w]) Stephan, Hamilton, Dunn, Bieter, Damberg, Kincaid, Sweetland
164. **Principles of Organization and Management of Hospitals.** Personnel department; legal liability; fiscal management; hospital insurance; research in administration. (6 cr; prereq 162, 163) Stephan, Hamilton, Dunn, Michaels, Bieter
166. **Hospital Clerkship.** Assignment to local hospital for survey and solution of special problem. (5 cr) Stephan, Bieter, Hoche
167. **Management Problems in Hospital Administration.** Assignment and solution of specific managerial problems. (6 cr; prereq 162, 163, 164) Hamilton
168. **Orientation to Medical Sciences.** Medical terminology, applied anatomy and physiology. (3 cr; prereq #) Thomson
169. **Administrative Residency.** Field work of 1 calendar year's duration in approved hospital; weighted rotation through departments, solution of special problems and preparation of an acceptable formal report. (Cr ar) Hamilton, Lentz, Stephan
170. **Seminar in Public Health Nursing.** Interpretation of background and trends in public health nursing; analysis of staff and supervisory practice. (2 cr, §170A; prereq health officers, others #) Murphy, Fritz
- 170A. **Public Health Nursing.** Scope of public health nursing; relationship to other aspects of public health. (1 cr, §170; prereq #) Murphy, Fritz
- 171-172. **Studies in Public Health Nursing.** Application of scientific method to selected topics; preparation of a study. (3 cr per qtr; prereq public health nurses only) Murphy

173. **Advanced Field Practice in Public Health Nursing: Functional Area.** Opportunity for field placement in suitable functional area including administration, supervision, consultation, or teaching under guidance of faculty members. (Cr ar; prereq public health nurses only, 174, 177, or #) Murphy, von Bergen, K Fritz, Pennebaker
- 174A-B. **Seminar in Administration, Supervision, and Consultation.** Analysis of selected aspects of administrative, supervisory, and consultant process in public health nursing situations. (2 cr per qtr; prereq public health nurses only, 171, 175, or #) Murphy, Blanchard
- 175-176-177. **Advanced Practice in Public Health Nursing.** Dynamics of human behavior; application to public health nursing practice on staff, supervisory, administrative, consultant levels through analysis of case material. (3 cr per qtr; prereq #) Williams, von Bergen, K Fritz
178. **Seminar in Public Health Nursing Consultation.** (2 cr; prereq #) K Fritz and associates
180. **Introduction to Biostatistics.** Variation; frequency distribution; probability; estimation; significance tests; binomial, normal, Poisson distributions; serial dilutions; most probable number. (6 cr; prereq environmental health students only, others #) Bearman
- 181-182-183. **Principles and Methods in Public Health Education.** Role of public health educator; group procedures; communication theory; mass media; program planning and evaluation. (3 cr per qtr; prereq #) Grout
190. **Field Work in Public Health Education.** Three months of supervised field experience. (Cr ar; prereq 183, 227) Grout and associates
191. **Science of Human Nutrition.** Surveys; nutritional status; undernutrition; malnutrition; dietetics in social relief and medical practice. (3 cr; prereq #) J Anderson, Keys
192. **Physiology of Exercise.** Muscular efficiency, training, deconditioning, effects of exercise on metabolism and physiological systems. (Cr ar; prereq Phsl 105, 107 or equiv and #) Taylor
195. **Public Health Aspects of Cardiovascular Disease.** Etiology, incidence; problems of control and relationship to mode of life. (3 cr; prereq #) Keys, Grande
196. **Rehabilitation Nursing and Long-Term Patient Care.** Nursing problems associated with rehabilitation; selected experiences correlated with seminars. (Cr ar; prereq 171, 175) E Anderson and associates
200. **Research.** Opportunities will be offered by the School and by various co-operating organizations for qualified students to pursue research work. (Cr ar) Staff
201. **Topics in Biometry.** Studies in special topics for advanced students. (Cr ar; prereq 120, 130 and #) Bearman and staff
202. **Seminar in Physiological Hygiene.** Nutrition, tests and measurements of human physical fitness; gerontology; adaptation in health and disease; body composition; circulatory dynamics and related topics. (1 cr) Staff
- 203-205-207. **Research Design in Biometry.** Methodology of design of experiments and sample surveys in behavioral and biological sciences; randomized blocks. Latin-squares, factorials, incomplete blocks, long-term experiments and analysis of groups of experiments; simple random, stratified, multistage, and multiphase sampling designs. (3 cr per qtr; prereq 130 or #) McHugh
- 204-206-208. **Theory of Research Design in Biometry.** Theory of linear estimation and general linear hypothesis; analysis of multiple classifications; components of variance; randomization theory of designs. (2 cr per qtr; prereq calculus and [203-205-207) McHugh
210. **Seminar in Public Health.** (Cr ar) Staff
211. **Seminar in Biometry.** (Cr ar) Staff
212. **Seminar in Public Health Engineering and Sanitation.** (Cr ar; prereq #) Bosch

213. **Seminar in Epidemiology.** Discussion of selected current epidemiologic problems. (Cr ar) Schuman
214. **School Health Programs.** Review of major health problems among school children; methods of providing and evaluating school health services. (2 cr; prereq 107 or #) Ar
215. **Maternal and Child Health.** Administration of well-child and antepartum conferences; psychosomatic problems of children. (Cr ar; prereq physicians only, #) Ar
- 216-218. **Biomedical Measurement Problems, Assays.** Qualitative and quantitative response-surface assays, density determination by plate counts and serial dilution, source and magnitude of variation associated with advanced measurement techniques. (3 cr per qtr; prereq 120) Brown
- 217-219. **Theory of Biomedical Measurement Problems, Assays.** (2 cr per qtr; prereq {216-218}) Brown
220. **Readings in Problems of Physiological Hygiene.** (Cr ar; prereq #) Keys and staff
227. **Problems in Public Health Education.** Independent study and experimentation in health education. (Cr ar; prereq #) Grout
230. **Field Practice in Environmental Sanitation.** (Cr ar; prereq #) Bosch
241. **Epidemiology of Noncommunicable Diseases.** Application of basic epidemiologic principles to noncommunicable diseases and to trauma; selected disease examples. (3 cr; prereq 104) Schuman
- 250-251-252. **Foundations of Biometry.** Measurement models, theories of probability, logic of induction, alternative theories of inference. (2 cr per qtr; prereq 208, 219 or #) Staff
- 261-262-263. **Alternative Patterns for Meeting Health Care Needs.** Future role of hospital in light of patient needs and community services. (3 cr per qtr; prereq #) Hamilton, Stephan, Lentz
264. **Seminar on Medical Care Patterns Abroad.** (3 cr; prereq #) Stephan, Lentz
265. **Seminar on Research Studies on Health Services.** (3 cr; prereq #) Lentz
266. **Hospital Administration Topics.** Independent study under tutorial guidance on selected problems, current issues. (Cr ar; prereq #) Hamilton
290. **Research in Physiological Hygiene and Related Areas.** (Cr ar) Staff

# *School of Dentistry*

## 1962-1964



Dentistry



Dental  
Hygiene



Dental  
Assisting

# Bulletin

# *of the UNIVERSITY of MINNESOTA*

# UNIVERSITY OF MINNESOTA

## Board of Regents

The Board of Regents is composed of The Honorable Charles W. Mayo, M.D., Rochester, First Vice President and Chairman; The Honorable Marjorie J. Howard (Mrs. C. Edward), Excelsior, Second Vice President; The Honorable Daniel C. Cainey, Owatonna; The Honorable Richard L. Griggs, Duluth; The Honorable Bjarne E. Grottum, Jackson; The Honorable Robert E. Hess, White Bear Lake; The Honorable Fred J. Hughes, St. Cloud; The Honorable A. I. Johnson, Benson; The Honorable Lester A. Malkerson, Minneapolis; The Honorable A. J. Olson, Renville; The Honorable Otto A. Silha, Minneapolis; and The Honorable Herman F. Skyberg, Fisher.

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## SCHOOL OF DENTISTRY

### Administration

William H. Crawford, D.D.S., Dean and Professor

Mellor R. Holland, D.D.S., M.S.D., Assistant Dean and Professor

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BULLETIN OF THE UNIVERSITY OF MINNESOTA

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# SCHOOL OF DENTISTRY

## General Information

The School of Dentistry is located in Owre Hall on Washington Avenue between Church Street and Union Street Southeast, on the Minneapolis Campus of the University of Minnesota. Its students enjoy all the advantages which come from participation in the activities of a university composed of academic, scientific, and professional schools and colleges.

Owre Hall is unsurpassed in its arrangement and facilities for the teaching of dentistry. The lecture rooms, laboratories, and clinics are furnished with the most modern equipment that has been developed for the teaching of the science and practice of dentistry.

These facilities and the highly specialized teaching staff in the basic medical science subjects and in dentistry enable the student to study dentistry under very favorable conditions. Instruction is given by lectures, laboratory courses, demonstrations, and clinical practice in the dental clinics. Throughout the entire program the teaching is integrated closely with the basic medical science laboratories and the clinical and hospital facilities of the Medical School.

The 4-year program in dentistry leading to the degree of doctor of dental surgery (D.D.S.) is open to both men and women. A prerequisite course of at least 2 years of acceptable collegiate education in arts and sciences lays the foundation for the required professional education. A freshman class in dentistry is admitted only once a year, in the fall, although students planning on entering dental school can begin their liberal arts education at any time.

## Requirements for Admission

**General**—A minimum of 90 quarter credits (60 semester credits) from an accredited liberal arts college is required although a broader and more liberal education can be attained if more than 2 years of course work are taken. Quality credits may not be used to decrease the above minimum credit requirement. The minimum scholastic average which may be considered is C, but acceptance is on a competitive basis and an average above C is usually necessary in order to achieve admission.

The required courses and minimum credits accepted are given below. The science courses must include both lecture and laboratory instruction.

1. English—12 quarter credits. If the basic English course is less than 12 quarter credits, additional credits can be completed in composition, literature, or speech to satisfy the minimum requirement of 12 quarter credits.
2. Biology or zoology—10 quarter credits
3. Physics—12 quarter credits
4. Inorganic chemistry—12 quarter credits. It is preferred that the course include semi-micro qualitative analysis.
5. Organic chemistry—8 quarter credits. The course content must contain both the aliphatic and aromatic series.

The elective courses should be selected to give the student as broad and liberal an education as possible within the limits of the time available. Preferably, the courses should include at least 20 credits in such liberal arts courses as anthropology, classics, economics, history, humanities, languages, philosophy, political science, psychology, sociology, and speech. Additional credits are recommended in mathematics, analytical

chemistry, comparative anatomy, genetics, basic drawing, and a course in the etymology of technical terms used in science.

A maximum of 5 quarter credits in ROTC courses and 4½ quarter credits in religion will be accepted as part of the 90 minimum quarter credits. However, credits in physical education, human anatomy, physiology, histology, and bacteriology are not acceptable as part of the 90 quarter credits required for admission.

If the student anticipates the possibility of taking graduate study following the earning of his D.D.S. degree, it is suggested that he prepare himself in his preadental education by taking additional credits in higher mathematics and the sciences.

At the University of Minnesota, the requirements for admission to the School of Dentistry are met by the following course of study, provided algebra and plane geometry were taken previously in high school:

1. Engl 1B-2B-3B (12 qtr cr); or  
Comm 1-2-3 (12 qtr cr); or Engl A-B-C (15 qtr cr)
2. Biol 1-2 (10 qtr cr)
3. InCh 4-5, 11 (14 qtr cr)
4. OrCh 61-62 (8 qtr cr)
5. Phys 1-2-3 and 1A-2A-3A (12 qtr cr)
6. Elective courses should include at least 20 credits in liberal arts subjects as listed above, and it is recommended that additional electives be selected from the following courses: Math T, 10, 15, 40; AnCh 57; Zool 56, 83; Art 20; and Clas 24.

**Dental Aptitude Test**—All applicants are required to take the Dental Aptitude Test. It is given three times a year, usually in October, January, and April. A good time to take the test is during the first quarter of the sophomore year, or as soon as the courses in biology or zoology and inorganic chemistry have been completed. Although the test generally measures aptitudes rather than special knowledge, some questions are specific and detailed; thus a review of biology and chemistry prior to taking the test is advisable. An application form and a brochure describing the test and listing the testing dates are available from the Office of Admissions and Records, 105 Administration Building, University of Minnesota, Minneapolis 14.

**Residence Requirements**—First choice is given to Minnesota residents, second choice to residents of neighboring states that do not have dental schools, and third choice to other nonresidents who have acceptable reasons for attending the University of Minnesota School of Dentistry. Nonresidents are accepted only if their scholarship has been outstanding and if their other qualifications indicate unusual promise for the study of dentistry and a career in science.

The Committee on Admissions will give preference to those applicants who have high scholastic records in college; who make satisfactory scores on the dental aptitude test; who will have completed all course requirements by the end of the usual academic year previous to the desired date of admission; who, after having been granted a provisional acceptance, maintain an academic record of quality at least as good as the record at the time of the provisional acceptance; and who, in all other respects, give promise of becoming successful students and dentists of high standing.

### **Application Procedures**

**General**—Application blanks can be secured from the Office of Admissions and Records, 105 Administration Building, University of Minnesota, Minneapolis 14. Applications should be filed between October 1 and April 15 of the academic year prior to the fall quarter the applicant desires to enroll in the School of Dentistry. While the closing date for application is April 15, early filing is encouraged since late application may be to the student's disadvantage. Applicants may be required to appear for a personal interview at the discretion of the Committee on Admissions.



Nonresidents are required to pay a \$5 credentials examination fee. This fee should accompany the application, and it should be in the form of a check, money order, or a bank draft made out to the University of Minnesota.

#### Students Now Attending the University of Minnesota—

1. Fill out an Admission Application (typewritten or in ink) and bring it to the Office of Admissions and Records.
2. Apply for a change of college at the College Transfer Window in the Office of Admissions and Records.
3. If you have attended any other colleges or universities before entering the University of Minnesota, *two* copies of complete transcripts from each institution attended previously must be attached to your application and filed with it. It is also the responsibility of the applicant to see to it that one copy of any transcripts from the University of Minnesota is on file in the office of the School of Dentistry at the time of application, and that supplemental transcripts are brought to the School of Dentistry at the termination of each quarter. Unless these instructions are followed implicitly, delays in processing an application will ensue.

#### Students Now Attending Other Colleges and Universities—

1. Fill out an Admissions Application (typewritten or in ink) as well as an Application for Admission with Advanced Standing.
2. Mail these applications, together with *two* official transcripts from each institution previously attended, to the Office of Admissions and Records, 105 Administration Building.
3. Following the completion of each semester's or quarter's course work two official transcripts of your grades must be forwarded to the Office of Admissions and Records, 105 Administration Building.

### Seven-Year Program in Arts and Dentistry Leading to the Degrees of Bachelor of Arts and Doctor of Dental Surgery

During the first 3 years of this program, the student pursues an academic course in the College of Science, Literature, and the Arts, subject to regulations of that college, and must secure at least 135 credits. Of the 135 credits, 45 must be earned in residence in Upper Division and a minimum of 30 must be in Upper Division courses.

The SLA credits must include a minor and 15 Upper Division credits outside the major and minor areas. Since the major area is dentistry, courses in those departments closely related to medical sciences may not be used to fulfill the requirement of 15 outside credits. An average of C must be maintained in all University of Minnesota courses, in all transfer credits applicable to the B.A. degree, and in courses taken in residence in Upper Division.

The requirements for admission to the Upper Division (see *Bulletin of the College of Science, Literature, and the Arts*) as well as work in chemistry, physics, and biology prescribed for admission to the School of Dentistry must be completed. Students transferring from other colleges must spend at least 1 year in the College of Science, Literature, and the Arts, earning a minimum of 45 quarter credits.

During the third year, the student elects courses in the Arts College, subject to the approval of the assistant dean for the Upper Division. The courses of the freshman and sophomore years in the School of Dentistry, exclusive of technical and practical work, when completed according to the standards required by that School count as the equivalent of the fourth year (45 credits of the Arts course). The student is then eligible for the B.A. degree, and he becomes eligible for the D.D.S. degree in 2 more years.

### **Bachelor of Science in Dentistry**

The bachelor of science degree will be granted to all students in the School of Dentistry who have satisfactorily completed 2 years of preidental work and 2 years of dentistry. This degree is optional on the part of the student.

### **Admission with Advanced Standing in Dentistry**

Students from other dental colleges whose standards are fully equivalent to those of this institution may be received into advanced classes. Such students must make formal application on the blank provided, and must submit transcripts covering both prerequisite and dental studies. Such credentials must show that the student has completed the required prerequisite subjects and has maintained the standard of scholarship required of students of this School.

Notebooks and other evidences of laboratory work must be presented. The amount of credit to be granted a student from another school is decided by the heads of the respective divisions in conference with the class committee. Subject credit (but not legal time credit) may be given for studies pursued in schools other than dental schools.

Students desiring advanced standing in dentistry should contact the School of Dentistry, 136 Owre Hall. The faculty has decided upon the following procedure which applies to any person desirous of entering this School with advanced standing:

1. Students applying for advanced standing must meet the equivalent of the prerequisite education required of our own students.
2. They must present formal credentials for their entire educational record. There is a fee of \$5 payable in advance to have these credentials evaluated.
3. They must take the University of Minnesota School of Dentistry placement tests which include written, oral, laboratory, and practical examinations in all of the basic medical sciences as well as in dental technology.
4. There must be a personal interview.
5. No persons over 40 years of age are eligible for this program.
6. Under no circumstances will advanced standing be granted beyond the beginning of the junior year.
7. Transfer students from other dental schools must provide a letter of recommendation from the dean of that school stating that the applicant is in good standing and is eligible for promotion to the next class.

### **Requirements for Graduation**

A candidate for the degree of doctor of dental surgery, after satisfying all the requirements for admission to the School of Dentistry, must have complied with all the rules and regulations and completed the required curriculum and must have been

recommended by the faculty of the School of Dentistry for the degree of doctor of dental surgery.

### Fees

Tuition fee (per quarter)	
Residents of Minnesota .....	\$145.00
Nonresidents .....	300.00
Credit hour tuition fee (unclassified students, auditors, and others carrying less than full work):	
Residents of Minnesota .....	12.25
Nonresidents .....	25.00
Record service fee (applicable only to students new to the University of Minnesota) .....	1.00
Incidental fee (per quarter) .....	20.00
(For privileges such as the Coffman Memorial Union, the Health Service, and the <i>Minnesota Daily</i> .)	
Graduation fee .....	10.00
Special fees:	
Credential examination fee (applicable to nonresidents) .....	5.00
Examination on subjects taken out of class. Such an examination may be taken only upon approval of the appropriate committee. (No fee for such examination on first entering the University, if taken within the first quarter) .....	5.00

**Privilege Fees**—The fee for the privilege of late registration or late payment of fees is \$3 through the first week of classes. During the second week the fee is \$5 and after the second week the fee is \$10.

### Dental Equipment and Books

Students are required to provide themselves with the instruments and textbooks specified in the Official List which will be mailed to new students in July. Dental instruments and equipment are not offered for sale by the University but may be purchased from regular dealers in dental supplies located near the campus. Books may be obtained from the Professional Colleges Bookstore in the Main Engineering Building or from other nearby bookstores.

The approximate costs of dental instruments and books are as follows:

	Instruments	Books	Materials	Laboratory Fees
Freshman Year .....	\$553.30	\$129.25	.....	\$ 8.00
Sophomore Year .....	734.85	123.25	64.40	12.00
Junior Year .....	256.00	128.20	.....	3.00
Senior Year .....	50.00	34.55	.....	.....

### Loans and Scholarships

The University of Minnesota has numerous loan funds. They are restricted in their distribution to individuals meeting certain requirements. A loan or scholarship usually cannot be obtained before 2 quarters of attendance at the University, during which time the student will have the opportunity to demonstrate his ability and integrity. The only security for loans to students is the character of the applicant and his ability to do college work. Application for loans or scholarships may be made to the Bureau of Student Loans and Scholarships located in Eddy Hall.

There are also a few scholarships and grants-in-aid available to capable students who serve part time as research assistants in the School of Dentistry.

### **Self-Support**

The University Employment Bureau assists students who find it necessary to earn part or all of their expenses. However, the program in dentistry is a full one, and students find it difficult to devote many hours a week to outside employment.

### **University Health Service**

Through the University Health Service the University makes available medical care, medical examinations, and health consultations. General service is provided free of charge, but special fees are charged for services which are specialized and individual in character, such as dentistry, X ray, board and laundry in the student hospital, outpatient calls, minor surgery, etc. No student, however, will be denied service because of inability to pay these fees. Major surgical operations or prolonged medical care ordinarily is secured through private physicians selected by the students or their families, but if necessary, operations may be arranged through the University Health Service upon an established basis.

### **Housing**

Most out-of-town students live either in University-maintained residence halls or in private rooming houses. All such students must live in University-approved residences under substantially the same obligations. Information concerning residence halls, private rooming houses, and facilities for married couples with or without children can be obtained from the Student Housing Bureau, 209 Eddy Hall. Application should be made early for accommodations. Final acceptance by the University is not necessary before applying. Cancellations may be made without penalty if the Student Housing Bureau is notified immediately following nonacceptance by the University.

### **Library**

The University of Minnesota Library is one of the finest libraries in existence today. It includes over 2 million volumes as well as many periodicals and pamphlets, and in scope takes in every subject in the University curriculum. Its large, airy reading rooms provide an excellent place to study.

The Biological-Medical Library is located 1 block south of the School of Dentistry building. It includes the former college and departmental libraries in zoology, botany, dentistry, medicine, pediatrics, and much of pharmacy. Reference books, texts, and treatises of various kinds are kept on open shelves in this library. This section includes all available literature on dentistry in book and periodical form, and additional volumes are purchased as soon as they have been recommended by the Library Committee of the faculty in dentistry. These library facilities offer the student an excellent opportunity to secure a knowledge of the science and practice of dentistry.

Also, reference books and periodicals for the use of students are located in Owre Hall in connection with the offices of the various divisions adjacent to lecture rooms, laboratories, and the clinic of the School of Dentistry.

### **Coffman Memorial Union**

The Coffman Memorial Union places Minnesota in the forefront of American universities as to the recreational facilities which it offers to students. The cafeterias and lunchrooms, committee dining rooms, lounges for men and women, game rooms,

bowling alleys, pool and billiard rooms, offices for student organizations, barber shop, beauty parlor, library, art room, and spacious ballrooms are among the features that make the building the popular center of campus life.

### **Honor Fraternity**

Omicron Kappa Upsilon, the national honor dental fraternity, is represented at Minnesota by the Beta Beta Chapter. Students are elected to membership in the senior year by the faculty on the basis of scholarship, character, and conduct. Not more than 12 per cent of the class is eligible.

### **Continuation Study Program**

The School of Dentistry regularly offers a series of continuation courses in various phases of dentistry and dental hygiene. These courses are intended to meet the needs of the profession for special material not covered in the undergraduate curriculum and in new developments in research and clinical procedures. Sessions usually are 3 days to 1 week in duration, and in many areas clinical practice is included. Special brochures listing courses, dates, and costs are available to those requesting that their names be placed on the mailing list. Inquiries should be mailed to the Center for Continuation Study, University of Minnesota, Minneapolis 14.

## FOUR-YEAR PROGRAM IN DENTISTRY

	Fall Qtr		Winter Qtr		Spring Qtr		Total	
	Cr	Hrs	Cr	Hrs	Cr	Hrs	Cr	Hrs
<b>Freshman Year</b>								
Dent 50-51-52—Dental Anatomy .....	2	40	3	70	3	70	8	180
Dent 55—Development of the Dento-Facial Complex .....	2	20					2	20
Dent 60-61-62—Dental Prosthetics .....	4	100	4	100	3	70	11	270
Anat 108—Systematic Anatomy .....			6	120			6	120
Anat 109—Anatomy of the Head and Neck .....					6	120	6	120
MicB 100—Microbiology for Dental Students .....					6	120	6	120
Met 159—Dental Physical Metallurgy .....			2	20			2	20
PhCh 104-105—Physiological Chemistry .....	7	110	5	50			12	160
PubH 76—Introduction to Public Health for Dental Students .....					1	10	1	10
	15	270	20	360	19	390	54	1020
<b>Sophomore Year</b>								
Dent 70—Dental Prosthetics .....	3	70					3	70
Dent 72C—Dental Prosthetics Clinic .....			2	40			2	40
Dent 75-76-77—Crown and Bridge Technic .....	4	100	4	100	4	100	12	300
Dent 80—Oral Diagnosis .....					1	10	1	10
Dent 81—Roentgenology .....					1	10	1	10
Dent 85-86—Operative Technic .....			4	100	4	100	8	200
Dent 90—Anesthesia .....					1	10	1	10
Anat 105—Microscopic Anatomy .....	8	140					8	140
Path 100—Pathology for Dental Students .....					8	130	8	130
Phsl 101—Human Physiology .....			10	120			10	120
	15	310	20	360	19	360	54	1030
<b>Junior Year</b>								
Dent 110-111—Dental Prosthetics .....	1	10	1	10			2	20
Dent 110C-111C-112C—Dental Prosthetics Clinic .....	3	90	2	60	2	60	7	210
Dent 120-122—Crown and Bridge .....	1	10			1	10	2	20
Dent 120C-121C-122C—Crown and Bridge Clinic .....	2	60	2	60	2	60	6	180
Dent 132C—Roentgenology Clerkship .....					1	36	1	36
Dent 140, 142—Operative Dentistry .....	1	10			2	20	3	30
Dent 140C-141C-142C—Operative Clinic .....	3	90	3	90	3	90	9	270
Dent 144—Endodontics .....	1	10					1	10
Dent 150—Introduction to Oral Surgery .....					1	10	1	10
Dent 160-161—Oral Pathology and Histology .....	4	60	1	10			5	70
Dent 170-171—Pedodontics .....	1	10	1	10			2	20
Dent 172C—Pedodontics Clinic .....					1	30	1	30
Dent 181-182—Periodontics .....			1	10	1	10	2	20
Dent 181C-182C—Periodontics Clinic .....			1	30	1	30	2	60
Phcl 101—Introduction to Pharmacology .....	2	20					2	20
Phcl 105—General and Experimental Pharmacology .....			6	100			6	100
Phcl 106—General Pharmacology .....					2	20	2	20
Phcl 108—Prescription Writing .....					1	10	1	10
	19	370	18	380	18	386	54	1136
<b>Senior Year</b>								
Dent 105—Orthodontics .....	3	30					3	30
Dent 115C-116C-117C—Dental Prosthetics Clinic .....	2	60	2	60	2	60	6	180
Dent 118—Restorative Dentistry Seminar .....					1	10	1	10
Dent 128—Restorative Dentistry Seminar .....	1	10					1	10
Dent 125C-126C-127C—Crown and Bridge Clinic .....	2	60	2	60	2	60	6	180
Dent 135-136—Oral Medicine .....			1	10	1	10	2	20
Dent 137C—Oral Diagnosis Clinic .....					1	30	1	30
Dent 145C-146C-147C—Clinical Operative Dentistry .....	2	60	3	90	2	60	7	210
Dent 148—Restorative Dentistry Seminar .....			1	10			1	10
Dent 149—The Management of Mass Casualties and First Aid .....			2	20			2	20
Dent 155-156—Oral Surgery .....	2	20	2	20			4	40
Dent 157C—Oral Surgery and Hospital Clinics .....					3	90	3	90
Dent 176C—Pedodontics Clinic .....			3	90			3	90
Dent 177C—Pedodontics Adolescent Clinic .....					1	10	1	10
Dent 185—Periodontics .....	1	10					1	10
Dent 185C-186C—Periodontics Clinic .....	1	30	1	30			2	60
Dent 195-198—Dental Jurisprudence .....	2	20	1	10			3	30
Dent 196—Practice Management .....					1	10	1	10
Dent 197—Professional Orientation .....					1	10	1	10
PubH 77—Dental Public Health .....			2	20			2	20
	16	300	20	420	15	350	51	1070

## DESCRIPTION OF COURSES

## DENTISTRY

## Division of Crown and Bridge

## Professor

Douglas H. Yock, D.D.S., M.S., *chairman*  
Hubert H. Serr, M.A., D.D.S.

## Clinical Assistant Professor

Lee C. Hermann, D.D.S.  
Melvin C. Humbert, D.D.S.  
Rad M. Jevric, D.D.S.  
Davey E. Lieb, D.D.S.  
George D. MacGibbon, D.D.S.  
Charles B. McAllister, D.D.S.

## Professorial Lecturer

Herman A. Garmers, D.D.S.

## Clinical Instructor

Robert R. Hoover, D.D.S.  
Eugene A. Moll, D.D.S.  
John A. Takala, D.D.S.

- 75-76-77. Crown and Bridge Technic.** Lectures, demonstrations, and laboratory work, including exercises in casting, free-hand and investment soldering and the construction of a lower hygienic bridge, an upper posterior bridge, upper and lower anterior bridges and a porcelain jacket crown. Weekly lectures cover laboratory technics, fundamental principles, and the science of dental materials in regard to metals, waxes, investments, cements, etc. An illustrated syllabus aids students in carrying out each project. (4 cr per qtr; 300 lab and lect hrs) Serr and staff
- 120. Crown and Bridge.** History of crown and bridge work, interpretations and objectives of the course, definitions and nomenclature, aims of the service, diagnosis, a consideration of types of abutment, retainers, and pontics. (1 cr; 10 lect hrs) Yock
- 122. Crown and Bridge.** Ceramics and acrylic resins as related to aesthetics in clinical restorative dentistry. Illustrated lectures covering the physical and chemical properties, the indications for use and the manipulation of porcelain and plastics in their practical application. (1 cr; 10 lect hrs) Yock and staff
- 120C-121C-122C. Crown and Bridge Clinic.** Demonstrations and clinical practice designed to orient the student in the Dental Clinic. Instruction is given in the diagnosis, designing, and construction of the simpler cases. (2 cr per qtr; 180 clin hrs) Yock and staff
- 125C-126C-127C. Crown and Bridge Clinic.** An advanced clinical course. Demonstrations and clinical practice. Includes the use of porcelain and acrylic resins in crown and bridge prosthetics together with instruction in the diagnosis, designing, and construction of more complicated cases. (2 cr per qtr; 180 clin hrs) Yock and staff
- 128. Restorative Dentistry Seminar.** Correlated series of lectures on the clinical approach to crown and bridge, operative, and prosthetic dentistry which overlap in technical procedures and biological concepts. (1 cr; 10 lect hrs) Staff

## Division of Dental Anatomy

## Professor

Ambert B. Hall, D.D.S., *chairman*

## Clinical Associate Professor

Robert N. Nelson, D.D.S.

## Assistant Professor

Anna T. Hampel, D.D.S., M.S.D.  
Maurice W. Meyer, D.D.S., M.S., Ph.D.

## Clinical Instructor

Irving A. Borkon, D.D.S.  
Cory H. Kruckenberg, D.D.S.  
Roger W. Ranfranz, D.D.S.

- 50-51-52. Dental Anatomy.** *Lectures:* dental nomenclature with special attention to the etymology and application of terms used in the various divisions of dentistry; detailed study of all deciduous and permanent teeth, including calcification, eruption, decalcification and shedding; tooth form, function, stresses, all phases of occlusion;

surrounding and investing tissues; pulp cavities and anomalies. *Laboratory*: projects include outline drawing, plasticine modeling, wax carvings individually and as an anatomical unit, and sectioning of teeth. (2-3-3 cr; 180 lab and lect hrs) Hall and staff

55. **Development of Dento-Facial Complex.** Introduction to the postnatal growth of the dento-facial complex. (2 cr; 20 lect hrs) Meyer

### Division of Dental Prosthetics

#### Professor

A. Theodore Morstad, D.D.S., M.S., *chairman*  
Ambert B. Hall, D.D.S.

#### Clinical Professor

Roy M. Jernall, D.D.S.

#### Clinical Associate Professor

Clarence N. Reiersen, D.D.S.

#### Assistant Professor

Maurice W. Meyer, D.D.S., M.S., Ph.D.

#### Clinical Assistant Professor

Edward E. Anderson, D.D.S., M.S.  
Rudolph B. Delton, D.D.S.  
Thomas J. Emond, D.D.S.  
Robert J. Jacobsen, D.D.S.

#### Clinical Instructor

Leonard H. Arndt, D.D.S.  
John F. Erickson, D.D.S.  
Odin M. Langsjoen, D.D.S.  
Imants R. Niels, D.D.S.  
Roger W. Ranfranz, D.D.S.

- 60-61-62. **Dental Prosthetics.** Lectures, demonstrations, and laboratory instruction covering the various phases of complete and partial denture prosthetics, materials used, their properties and manipulations; fundamental principles of denture construction including retention, occlusion, and aesthetics; instruments and terminology used in dental prosthetics. (4-4-3 cr; 270 lab and lect hrs) Hall and staff
70. **Dental Prosthetics.** Laboratory instruction includes the construction of cast removable partial dentures on models. The lecture series presents an introduction to designing of partial dentures by co-ordinating the laboratory instruction with the knowledge the student is acquiring in the basic science courses. (3 cr; 70 lect and lab hrs) Morstad and staff
- 72C. **Dental Prosthetics Clinic.** Clinical demonstrations in complete denture prosthetics and practice by students in the making of impressions and making casts in various types of materials. (2 cr; 40 hrs) Staff
- 110-111. **Dental Prosthetics.** Lectures on complete and partial denture prosthesis correlating the student's accumulated knowledge in the fundamental sciences and dental techniques to enable him to carry out procedures and solve problems associated with removable denture prosthesis. (1 cr per qtr; 20 lect hrs) Staff
- 110C-111C-112C. **Dental Prosthetics Clinic.** Clinical practice in the various types of removable denture prosthesis. An integral part of the program is to teach the proper and efficient use of auxiliary dental personnel such as the laboratory technician. (3-2-2 cr; 180 clin and lab hrs) Staff
- 115C-116C-117C. **Dental Prosthetics Clinic.** Clinical practice in removable denture prosthesis continuing the work of the junior year. In addition, completion of immediate denture prosthesis is required. Practice in precision attachment partials and prosthesis for abnormal mouth conditions. (2 cr per qtr; 180 clin and lab hrs) Staff
118. **Restorative Dentistry Seminar.** Correlated series of lectures on the clinical approach to crown and bridge, operative, and removable prosthetic dentistry which overlap in technical procedures and biological concepts. (1 cr; 10 lect hrs) Staff

### Division of Operative Dentistry

#### Professor

James R. Jensen, D.D.S., M.S.D., *chairman*

#### Associate Professor

John W. Wakely, D.D.S., M.S.

#### Clinical Associate Professor

William F. Braasch, D.D.S.  
Blanchard K. Braum, D.D.S.  
Herbert A. Carlson, D.D.S.



**Assistant Professor**

Anna T. Hampel, D.D.S., M.S.D.

**Clinical Assistant Professor**

Herman T. Aeziman, D.D.S.

Peter S. Gregus, D.D.S.

Miles B. Hirschey, D.D.S.

Kanji Horita, D.D.S.

**Clinical Instructor**

David R. Bernard, D.D.S.

Kenneth J. Buechele, D.D.S.

Donald J. Casey, D.D.S.

Gerald A. Rosdahl, D.D.S.

Arthur R. Schmidt, D.D.S.

Hugo M. Wolf, D.D.S.

- 85-86. Operative Technic.** Introduction to the nomenclature of operative dentistry, principles of cavity preparation, manipulation of restorative materials and related instrumentation. (4 cr per qtr; 220 lect hrs) Wakely and staff
- 140. Operative Dentistry.** Introduction to clinical practice with emphasis on diagnosis and treatment planning. (1 cr; 10 lect hrs) Jensen and staff
- 142. Operative Dentistry.** Advanced clinical technics with special concepts and modifications in cavity design, biological considerations in the application of operative dentistry, and technical information on the use of materials adjunctive to restorative technics. (2 cr; 20 lect hrs) Jensen and staff
- 140C-141C-142C. Operative Dentistry Clinic.** Preliminary indoctrination to clinical procedures, consisting of small group clinics demonstrating operative procedures on patients. During the remainder of junior year students practice operative dentistry on assigned patients under close supervision of staff. (3 cr per qtr; 270 hrs) Jensen and staff
- 144. Endodontics.** Diagnosis and treatment of pulp and periapically involved teeth supplemented with demonstrations on clinical cases. (1 cr; 10 lect hrs) Jensen and staff
- 145C-146C-147C. Clinical Operative Dentistry.** Upon evidence of satisfactory orientation into the operative clinic, the senior student engages in a clinical practice in which requirements for graduation are both qualitative and quantitative. Under direction of the staff, emphasis is placed upon efficiency and finesse in operating. Practical examinations are held during final week of each quarter to determine progress. (2-3-2 cr; 210 hrs) Jensen and staff
- 148. Restorative Dentistry Seminar.** Correlated series of lectures on the clinical approach to crown and bridge, operative and prosthetic dentistry which overlap in technical procedures and biological concepts. (1 cr; 10 lect hrs) Staff
- 149. The Management of Mass Casualties and First Aid.** The place of the dentist in the medical team in the event of natural or man-made disaster. Instruction in civil defense planning, sorting of casualties, first aid treatment of shock, hemorrhage control, maintenance of the airway, burns, fractures, wounds and sanitation, and radiation aspects of mass casualty situations. (2 cr; 20 lect hrs) Jensen and staff

### Division of Oral Diagnosis, Oral Medicine, and Oral Roentgenology

**Professor**

Wendell L. Bartholdi, Ph.D., D.D.S., *chairman*

**Clinical Associate Professor**

William Branstad, D.D.S.

**Assistant Professor**

Eugene E. Petersen, D.D.S., M.S.D.

**Clinical Assistant Professor**

Harold J. Panuska, D.D.S., M.S.D.

- 80. Oral Diagnosis.** Oral examinations, methods of investigation, and recording of clinical data. (1 cr; 10 lect hrs) Bartholdi
- 81. Roentgenology.** Lectures and demonstrations on the application of Roentgen rays for dental diagnostic purposes. Includes the electrophysics of the apparatus, positioning of the films, angulation of the machine, processing and interpretation. (1 cr; 10 lect hrs) Petersen
- 132C. Roentgenology Clerkship.** Students serve regular clerkships in Division of Roentgenology—taking, processing, and mounting dental X-rays. Concurrent with the clerkship, conference sections are arranged for small groups of students in which

radiographs of clinical patients are read and interpreted. (1 cr; 36 clin hrs) Bartholdi, Petersen

**135-136. Oral Medicine.** Oral manifestations of systemic and local diseases. Small group conferences on laboratory procedure for diagnostic purposes are arranged. (1 cr per qtr; 20 lect hrs) Panuska, Bartholdi

**137C. Oral Diagnosis Clinic.** Students serve as admission clerks in the Division of Oral Diagnosis. (1 cr; 30 clin hrs) Bartholdi

### Division of Oral Histology and Pathology

#### Professor

Robert J. Gorlin, D.D.S., M.S., *chairman*

**160-161. Oral Pathology and Histology.** Lectures and laboratory work covering the histology of the teeth and related oral tissues including embryologic considerations. Special pathology of the oral region as well as the relation of local pathologic findings to systemic conditions and to general pathology are emphasized. (4-1 cr; 44 lect hrs) Gorlin

### Division of Oral Surgery

#### Professor

Henry B. Clark, Jr., M.D., D.D.S., *chairman*  
Mellor R. Holland, D.D.S., M.S.D.  
Norman O. Holte, D.D.S., M.S.D.

#### Clinical Assistant Professor

Theodore H. Dedolph, Jr., D.D.S., M.S.D.  
William J. Dresser, D.D.S., M.S.D.  
Angus R. Stoesz, D.D.S., M.S.D.

**90. Anesthesia.** Lecture course on local and general anesthesia. (1 cr; 10 lect hrs) Holte, Holland

**150. Introduction to Oral Surgery.** Introductory principles and practice of minor oral surgery. Indications for tooth removal, operative technique, precautions against accident, and postoperative care. (1 cr; 10 lect hrs) Holte, Holland

**155. Oral Surgery.** Technique of removal of unerupted teeth, alveolectomy, tooth removals in children and in patients with systemic disease. Procedure for working in the hospital operating room is discussed. Consideration is given to the correlation of the basic sciences of anatomy, pathology, and physiology to oral surgery in the matters of examinations, diagnosis, and the treatment of jaw infections and injuries. (2 cr; 20 lect hrs) Clark and staff

**156. Oral Surgery.** (Continuation of 155) The following special conditions are discussed and illustrated by lantern slides and motion pictures: wounds of soft tissues, fractures of the jaws, cysts and benign tumors, diseases of the maxillary sinus, deformities of the mouth and jaws, special infections, and affections of the nerves of the oral cavity and adjacent regions. (2 cr; 20 lect hrs) Clark and staff

**157C. Oral Surgery and Hospital Clinics.** In junior year, 5 periods are spent in observation and assisting in the Oral Surgery Clinic. In senior year, 20 periods are devoted to the actual practice of tooth removal, alveolectomy, taking of biopsies, and other commonly encountered oral surgical conditions. Experience with unerupted teeth, cysts, fractures, maxillary sinus infections, and other more complicated conditions is gained by assisting and observation. Ten periods are devoted to demonstrations, observation, clinics, and conferences in the University Hospitals. (3 cr; 90 clin hrs) Clark and staff

### Division of Orthodontics

#### Clinical Professor

Sherwood R. Steadman, D.D.S., M.S.D.,  
*acting chairman*

#### Clinical Associate Professor

Walter M. Jacobsen, D.D.S., M.S.

#### Clinical Assistant Professor

Theodore T. Edblom, D.D.S., M.S.D.  
Robert R. Etem, D.D.S., M.S.D.  
Jerry E. Johnson, D.D.S., M.S.D.  
James W. Monson, D.D.S., M.S.D.  
Lloyd E. Pearson, D.D.S., M.S.D.  
Charles D. Simpson, D.D.S., M.S.D.

- 55C-84C-95C-105C. Serial Study of Transition from Deciduous to Permanent Dentition.** (Freshman, Sophomore, Junior, Senior students) One-half day per year observing the same patient. Annual cephalometric X-rays, records, casts taken on the same 50 patients. Jacobsen
- 105. Orthodontics.** Principles and procedures in preventive and corrective orthodontics. Analysis of cases and treatment planning. (3 cr; 30 lect hrs) Monson

### Division of Pedodontics

#### Professor

Harold C. Wittich, D.D.S., *chairman*

#### Clinical Assistant Professor

Kenneth C. Erickson, D.D.S.  
Walter G. Iverson, D.D.S.

#### Clinical Instructor

Dennis J. Brandstetter, D.D.S.  
Warren W. Hunt, D.D.S.  
Roger R. Severinson, D.D.S.  
Paul G. Smith, D.D.S.  
Russell H. Solsvig, D.D.S.  
Douglas V. Streed, D.D.S.  
William M. Trygstad, D.D.S.  
Marion R. White, D.D.S.

- 170. Pedodontics.** Value and aims of pedodontics, management of child patient, diagnosis, treatment planning, principles of cavity preparation for deciduous teeth, comparative anatomy of deciduous and permanent teeth, premedication, use of stainless steel and local anesthesia. (1 cr; 10 lect hrs) Wittich
- 171. Pedodontics.** Treatment of pulps of deciduous teeth, restoration of fractured permanent anterior teeth, space maintainers, dental guidance for adolescent children, topical application of fluorides, construction of partial and full dentures for children, and caries prevention. (1 cr; 10 lect hrs) Wittich
- 172C. Pedodontics Clinic.** Special group demonstrations to students. Clinical course in cavity preparation and insertion of fillings in deciduous and permanent teeth, use of stainless steel crowns. (1 cr; 30 clin hrs) Wittich and staff
- 176C. Pedodontics Clinic.** Clinical experience in filling deciduous and permanent teeth, treatment of pulps of deciduous teeth, restoration of fractured permanent anterior teeth, construction of space maintainers, partial and full dentures, use of stainless steel crowns, and topical application of fluorides. (3 cr; 90 clin hrs) Wittich and staff
- 177C. Pedodontics Adolescent Clinic.** Special clinical experience in multiple cavity preparation and fillings for adolescent children. (1 cr; 10 clin hrs) Wittich and staff

### Division of Periodontics

#### Clinical Professor

Erwin M. Schaffer, D.D.S., M.S.D., *acting chairman*

#### Clinical Associate Professor

Marmion W. Houghlum, D.D.S., M.S.D.  
George C. Lawther, D.D.S., M.S.D.

#### Clinical Instructor

William L. Hartwick, D.D.S.  
Gregory R. Stende, D.D.S.

#### Research Fellow

Norman A. Korn, D.D.S., M.S.D.

- 181-182. Periodontics.** Histology and pathology of the structures involved in periodontal disease. Etiology, diagnosis, treatment, and prevention of periodontal disease are included. (1 cr per qtr; 20 hrs) Schaffer and staff
- 181C-182C. Periodontics Clinic.** Clinical practices in the treatment of diseases affecting the investing tissues of the teeth. (1 cr per qtr; 60 clin hrs) Schaffer and staff
- 185. Periodontics.** Continuation of previous lectures with emphasis on the occlusal factors and surgical therapy. (1 cr; 10 lect hrs) Schaffer and staff
- 185C-186C. Periodontics Clinic.** Clinical treatment of periodontal disease. (1 cr per qtr; 60 clin hrs) Schaffer and staff

## Nondivisional Courses

### Dean and Professor

William H. Crawford, D.D.S.

### Professorial Lecturer

Irving R. Brand, LL.B.  
Ainsley T. Thorson, D.D.S.

### Visiting Lecturer

Rueben N. Albinson, D.D.S.  
William Von Bank, D.D.S.

- 195-198. Dental Jurisprudence and Ethics.** Judicial systems, administration, and proceedings; regulation of practice of dentistry; organization of practice; ethics; advertising; fee-splitting, etc.; legal problems incident to purchasing and leasing real estate and purchasing personal property; accounting; taxation; wills and estate planning; contracts; malpractice; and insurance. (2-1 cr) Brand
- 196. Practice Management.** Establishing a practice, office location, arrangement, equipment, and personnel; dentist-patient relationships, records, fees, credit, and collections; office accounting, professional insurance, investments, and taxes; purchasing supplies. (1 cr) Thorson
- 197. Professional Orientation.** General history of dentistry and of the University of Minnesota School of Dentistry; growth and importance of dental societies and organizations; significant social, economic, and health legislation; the code of ethics of the A.D.A.; social and professional obligations of the dentist. (1 cr) Crawford and staff

## CONTRIBUTING DEPARTMENTS

### Anatomy

#### Professor

Arnold Lazarow, M.D., Ph.D., *chairman*  
J. Francis Hartmann, Ph.D.  
Charles F. Morgan, Ph.D.  
R. Dorothy Sundberg, Ph.D., M.D.  
Lemen J. Wells, Ph.D.

#### Associate Professor

Anna M. Carpenter, Ph.D., M.D.  
William J. L. Felts, Ph.D.

#### Assistant Professor

Carl B. Heggstad, M.D., Ph.D.  
Morris Smithberg, Ph.D.

- 105. Microscopic Anatomy.** Minute structure and development of the tissues and organs of the body including the nervous system, with special emphasis upon the teeth and digestive tract. Lectures, recitations, and laboratory work. (8 cr; 140 hrs; microscope required; use of microscope may be obtained by purchasing two \$3 microscope cards from bursar) Anatomy staff
- 108. Systematic Anatomy.** Comprehensive treatment of the various organ systems of the human body. Lectures, recitations, and laboratory work. (6 cr; 120 hrs) Anatomy staff
- 109. Anatomy of the Head and Neck.** Detailed dissection of the human head and neck with correlative treatment of the upper extremity. (6 cr; 120 hrs) Anatomy staff

### Microbiology

#### Professor

John Spizizen, Ph.D., *chairman*  
William F. Scherer, M.D.  
Dennis W. Watson, Ph.D.

#### Associate Professor

S. Gaylen Bradley, Ph.D.  
Gerhard Brand, M.D.  
Leroy C. McLaren, Ph.D.  
Edwin L. Schmidt, Ph.D.

#### Assistant Professor

Sidney E. Grossberg, M.D.  
Wendell H. Hall, M.D., Ph.D.  
John C. Herweg, M.D.  
John D. Ross, Ph.D.  
John E. Verna, Ph.D.

#### Instructor

Ronald W. Hinz, Ph.D.  
James T. Prince, M.S.  
Richard E. Shope, Jr., D.V.M.  
Joseph W. St. Geme, M.D.  
Perry E. Treadwell, Ph.D.

- 100. Microbiology for Dental Students.** Lectures and laboratory exercises comprise a survey of microbiology including fundamental aspects of bacterial physiology, immunology, mycology, and virology. Role of microorganisms as etiologic agents of dental disease receives special attention. (6 cr; 132 hrs; microscope required; use of microscope may be obtained by purchasing \$3 microscope card from bursar) McLaren, Staff

### Pathology

#### Professor

James R. Dawson, M.D., *chairman*  
Robert Hebbel, M.D., Ph.D.

#### Instructor

Erhard Haus, M.D.  
Bertram F. Woolfrey, M.D.

#### Associate Professor

Paul H. Lober, M.D., Ph.D.  
Lee W. Wattenberg, M.D.

- 100. Pathology for Dental Students.** Circulatory disturbances, metabolic change in cells and tissues, pigment deposits, inflammations and tumors. Pathology of selected diseases, tumors, and lesions affecting the mouth and dental structures. Exercise in gross and microscopic diagnosis. (8 cr; 130 hrs; microscope required; use of microscope may be obtained by purchasing \$6 microscope card from bursar) Dawson and assistants

### Pharmacology

#### Professor

Raymond N. Bieter, M.D., Ph.D., *chairman*  
Norman O. Holte, D.D.S., M.S.D.  
Harold N. G. Wright, Ph.D.

#### Assistant Professor

Elizabeth M. Cranston, Ph.D.

- 101. Introduction to Pharmacology.** (2 cr; 20 hrs) Bieter, Wright, and staff  
**105. General and Experimental Pharmacology.** Detailed lecture and laboratory study of important drugs. (6 cr; 100 hrs) Bieter, Wright, and staff  
**106. General Pharmacology.** Lecture continuation of 105. (2 cr; 20 hrs) Bieter, Wright, and staff  
**108. Prescription Writing.** (1 cr; 10 hrs) Wright

### Physical Metallurgy

#### Professor

Morris E. Nicholson, Ph.D., *chairman*

#### Associate Professor

Henry S. Jerabek, Ph.D.

- 159. Dental Physical Metallurgy.** Basic course for dental students involving theory of metals and alloys, constitution diagrams, heat treatment, properties and applications of metals and alloys used in dentistry. (2 cr; 20 hrs) Jerabek

### Physiological Chemistry

#### Professor

Wallace D. Armstrong, Ph.D., M.D., *chairman*  
Cyrus P. Barnum, Jr., Ph.D.  
Paul D. Boyer, Ph.D.

#### Assistant Professor

Curtis H. Carlson, Ph.D., M.D.  
James F. Koerner, Ph.D.  
John F. Van Pilsum, Ph.D.

#### Associate Professor

Charles W. Carr, Ph.D.  
Leon Singer, Ph.D.  
Frank Ungar, Ph.D.

- 104. Physiological Chemistry.** (7 cr; 110 hrs; a \$5 physiological chemistry card must be purchased from bursar; laboratory desks will not be assigned until this card is pre-

sented; cost of special chemicals, nonreturnable equipment, and breakage will be charged against the deposit) Singer, Carr, Carlson

**105. Physiological Chemistry.** (5 cr; 50 hrs) Singer, Carlson, Van Pilsum

### Physiology

#### Professor

Maurice B. Visscher, M.D., Ph.D., *chairman*  
 John A. Johnson, Ph.D., M.D.  
 Joseph T. King, M.D., Ph.D.  
 Nathan Lifson, M.D., Ph.D.  
 Victor Lorber, M.D., Ph.D.  
 Carlos Martinez, M.D., Ph.D.  
 Carlo A. Terzuolo, M.D.

#### Assistant Professor

R. L. Evans, Ph.D.  
 I. J. Fox, M.D.  
 J. S. Lee, Ph.D.  
 L. O. Pilgeram, Ph.D.

#### Lecturer

Maurice W. Meyer, D.D.S., Ph.D.

#### Associate Professor

Marvin Bacaner, M.D.  
 H. Meade Cavert, M.D., Ph.D.  
 Charles Edwards, Ph.D.  
 Eugene D. Grim, Ph.D.  
 Rodney B. Harvey, M.D., Ph.D.

**101. Human Physiology.** Principles of physiology for dental students and others. Physiology of cells, muscle, nerve, central nervous system, senses, blood, circulation, respiration, digestion, metabolism, endocrines, excretion. (10 cr; 120 hrs) Staff

### Public Health

#### Lecturer

William A. Jordan, D.D.S., M.P.H.

- 76. Introduction to Public Health for Dental Students.** Designed to orient the dental student to public health. Furnishes a background of information of those public health measures which will enable the dentist to understand better his role in the health of his community. Public health administration and health agencies involved will be outlined briefly. (1 cr; 10 hrs) Jordan
- 77. Dental Public Health.** Designed to demonstrate the application of various dental practices and dental preventive and control measures to the field of public health. Knowledge of methods of organizing and evaluating community dental health programs will assist the private dental practitioner to fulfill better his professional status in his community. (2 cr; 20 hrs) Jordan

# Graduate Education in Dentistry

## GENERAL INFORMATION

Graduate work in dentistry is offered to meet the need in two areas. The first concerns the preparation of qualified teachers and investigators in the various branches of dentistry. The second concerns the preparation of fully trained specialists for the various fields of dentistry. The course of study leads to the degree of M.S. in dentistry, a combination of the conventional work for the master of science degree plus the achievement of proficiency in some phase of clinical dentistry. Hence, the course requires 2 academic years, but most students will require a minimum of 3 years.

### Requirements for Enrollment in the Graduate School

**Eligibility**—To be eligible for enrollment in this program the applicant must be a graduate of an accredited school of dentistry and must have achieved in both pre dental and dental requirements a superior scholastic record, which shall be demonstrated by a standing in the top fourth of his graduating class, or by an average of B or better.

**Application for Enrollment**—Application to pursue the course of graduate study should be initiated by a letter to the dean of the Graduate School, requesting an application form and the appropriate bulletin. This form, completely filled out, should be submitted to the dean of the Graduate School for evaluation.

**Notification of Acceptance**—Acceptance for graduate study is contingent upon the applicant's qualifications, facilities available for the course of study requested, and upon vacancies in the area indicated. Notification of acceptance or rejection will come from the Graduate School office.

**Registration**—Each student will choose an adviser, normally that faculty member whose scholastic and research interests most closely parallel his own. He will secure registration forms in the Graduate School office each quarter during the periods scheduled for registration, and will have them signed by his adviser, and will present them at the Graduate School office for the approval of the dean of the Graduate School. Following initial registration in the Graduate School, an advisory committee will be appointed for each student.

**Tuition**—The tuition fee for graduate work in dentistry is \$145 per quarter for residents and \$300 per quarter for nonresidents. For students who are majoring in the fundamental sciences, the tuition fee is \$86 per quarter for residents and \$225 per quarter for nonresidents.

### Requirements for Admission to Candidacy

**Period of Trial**—The first period of study by a graduate student is a period of trial. Advancement toward the Master's degree will not be officially authorized until the student has completed 1 quarter of residence and has demonstrated competence in not less than 9 quarter credits of graduate work.

**Filing of Application**—After the completion of 9 credits of graduate work, an Application for Candidacy form must be obtained from the Graduate School office, completed, and returned to that office. The student will be duly notified of the result

of this action. He will then proceed to meet with his advisory committee for the purpose of outlining the balance of his course of study.

### Requirements for the Degree of Master of Science in Dentistry

**Program of Study**—Upon enrollment in the Graduate School, the student and his adviser will outline a tentative course of study, which must form a consistent plan of work pursued with a definite aim. Following admission to candidacy, a definite plan of study for the entire course must be formulated by the student and his advisory committee.

**Major**—The aim of the program of study is to achieve mastery of a specific field of knowledge. This field is designated the major subject. Not less than 18 credits of the study program will be in the major subject. The minimum acceptable quality in these courses is indicated by a grade of B.

**Minor**—Each student must select an area of study in the basic sciences which is logically related to his major subject and his research project. Not less than 9 credits of the study program will be in the minor subject. The minimum acceptable quality in these courses is indicated by a grade of C.

**Research and Thesis**—The M.S. in dentistry is offered under Plan A, the plan which requires a thesis. Each candidate must submit a thesis. The thesis shall present evidence of ability and accomplishment in the planning and the prosecution of scientific research by the candidate and should demonstrate significant accomplishment on the part of the candidate in applying the scientific method. It is especially to be noted that the tabulation of data confirming earlier established observations is not acceptable. Statistical studies of clinical material may, however, be appropriate if through such studies new discoveries are made. The distinction between the Master's and the doctoral dissertation shall be in the importance and extent of the studies in question. Both shall represent contributions to knowledge made by the candidate. The candidate shall, except in unusual cases where the problem would not permit, himself make the majority of the original observations upon which the thesis is based.

After approval of candidacy and before the final quarter the title must be filed with the dean of the Graduate School on a form which may be secured in the Graduate School office. The thesis title must be approved by the student's adviser and by the Committee on Dental Graduate Education and Research.

No material which has been published prior to its approval by the thesis committee may be used to meet the thesis requirement for any advanced degree. Candidates contemplating publication of any materials which they expect to present for a thesis should therefore arrange through the Graduate School office to obtain such approval.

The Master's thesis must be typewritten in quadruplicate, 2 of the copies on a special form of paper, and the other 2 on lighter weight bond. Samples of paper required should be examined in the Graduate School office. Ample margin should be left for binding purposes. The body of the thesis should be double spaced, but footnotes may be single spaced. The 4 copies of the thesis, certified by the adviser as complete, must be registered in the dean's office of the Graduate School not later than 8 weeks before graduation. The thesis will be examined by a committee appointed by the dean on recommendation of the Committee on Dental Education and Research at the time the thesis subject is submitted. Unanimous approval by the thesis committee is necessary for the acceptance of the thesis. If the thesis is accepted, the candidate must deposit with the Office of Admissions and Records, at least 5 weeks before commencement, a fee for binding 2 copies of the thesis, which will be catalogued and deposited in the University Library. The third copy will be placed in the major department, the fourth copy reverting to the student.



**Final Examinations—**

**Written Examination—**In addition to the usual course examinations in all subjects where such are given, the candidate for the Master's degree will be required to pass a final written examination in the field of his major. No special final examination is required in the minor. The final written examination will be held prior to the oral examination. It is given by the members of the graduate faculty in the major department, the adviser acting as chairman. This examination shall cover all the work done in the major, and may include any work fundamental thereto.

**Oral Examination—**The final oral examination will be held not less than 5 weeks before commencement. This examination will be administered by the student's thesis committee.

The final oral examination will cover all the work offered for the degree, and may include other work fundamental thereto. At the close of the examination, the committee will vote upon the candidate, taking into account all of his work. A majority vote is required for approval.

**Recommendation by the Faculty—**The dean of the Graduate School will report to the Executive Committee of the graduate faculty the names of those who have completed the requirements for the degree, and those duly approved will be recommended by the faculty to the Board of Regents of the University. Unless excused by the dean of the Graduate School on the basis of a petition to receive the degree *in absentia*, all candidates are required to be present at commencement when the degrees are conferred.

**Areas in Which Graduate Courses Are Offered**

At present, graduate courses in dentistry are offered in the major fields of oral pathology, oral surgery, orthodontics, restorative dentistry, oral medicine, and periodontics.

**Standards—**Graduate work in the field of dentistry follows the same general policies and methods established for graduate work in other sciences. This work requires high standards of admission, qualified advisers to graduate students, adequate laboratories and clinical equipment, courses and examinations in residence, and evidence of the power of productive research on the part of the student.

**Method of Study—**The plan of graduate study at the University of Minnesota implies an entirely different level of educational discipline from undergraduate course work. In the former, each student pursues his individual problem. While there will be ample consultation and guidance, the individual student's special interest in selection of subjects will be the basis for outlining the courses. The general principle of application of basic science to clinical problems is emphasized throughout.

**Programs for Doctor of Philosophy**

The Ph.D. degree, related to dentistry, may be secured at the University by two general procedures.

One is through a program in which the student selects a major field of study in one of the basic medical sciences and a minor in a second basic science. Information regarding this program can be obtained by inquiry to the dean of the Graduate School.

The other procedure, only recently established, is one in which the student selects one of the basic medical sciences for the major field and the minor in dentistry. This program has been designed to meet the special needs of teachers and research workers in dentistry.

Further information regarding this program may be secured by inquiry from the School of Dentistry or the Graduate School.

## DESCRIPTION OF GRADUATE COURSES

### Oral Diagnosis

- 230f,w,s,su. Advanced Oral Diagnosis.** Survey of the basic principles of oral examinations, differential clinical diagnostic techniques, and treatment planning. Topics dealing with oral manifestations of systemic disease and systemic manifestations of oral disease are assigned for collateral reading. (Cr and hrs ar) Bartholdi
- 231f,w,s,su. Advanced Clinical Oral Diagnosis.** Practical work in the clinic: taking and recording case histories, making oral examinations, and setting up a detailed treatment plan. (Cr and hrs ar) Bartholdi
- 232f,w,s,su. Research Problems in Oral Medicine.** (Cr and hrs ar) Bartholdi
- 261f,w,s,su. Advanced Dental Roentgenology.** Systematic consideration of the basic factors governing X radiation, emphasizing recent advances in biophysics with special reference to the technique and material used. Demonstration and practice. (Cr and hrs ar) Petersen

### Oral Pathology

- 260f. Oral Pathology and Histology.** Lectures and laboratory work covering the histology of the teeth and related oral tissues including embryologic considerations. Special pathology of the oral region as well as the relation of local pathologic findings to systemic conditions and to general pathology are emphasized. Graduate students participate as laboratory assistants and fulfill some additional requirements. (5 cr) Gorlin and staff
- 262f,w,s,su. Research in Oral Pathology.** (Cr and hrs ar) Gorlin
- 263f,w,s. Oral Pathology Seminar.** (1 cr) Gorlin
- 266s. Advanced Oral Pathology.** Salivary gland development and pathology; dental organ pathology; bone physiology and pathology; radiation pathology; dermatopathology; lymph node and/or reticuloendothelial pathology; soft tissue pathology; pertaining to the head and neck. (1 cr; limited to 8 students; offered alt yrs) Gorlin

### Oral Surgery

- 250f,w,s,su. Advanced Oral Surgery.** Includes assigned clinics in University Hospitals such as Tumor, Plastic, and Hospital Dental Clinic in addition to the regular periods in the Dental School. (Cr and hrs ar) Clark and staff
- 251f,w,s,su. Oral Surgery Seminar.** (1 cr) Clark
- 252f,w,s,su. Research in Oral Surgery.** (Cr and hrs ar) Clark and staff
- 253f,w,s,su. Problems in Oral Surgery.** (Cr and hrs ar) Clark and staff

### Orthodontics

- 200f,w,s,su. Advanced Orthodontic Techniques.** (Cr and hrs ar) Steadman, Simpson, Monson, and staff
- 201f,w,s,su. Treatment Procedures in Orthodontics.** (Cr and hrs ar) Steadman, Simpson, Monson, and staff
- 202f,w,s,su. Case Analysis.** (Cr and hrs ar) Steadman, Simpson, Monson
- 203f,w,s,su. Treatment Planning.** (Cr and hrs ar) Steadman, Simpson, Monson, and staff
- 204f,w,s,su. Advanced Clinical Orthodontics.** (Cr and hrs ar) Steadman, Simpson, Monson, and staff

- 205f,w,s,su. **Osteology and Myology of the Head.** (Cr and hrs ar) Steadman
- 206f,w,s,su. **Growth of the Head.** (Cr and hrs ar) Steadman
- 207f,w,s,su. **Comparative Odontology.** (Cr and hrs ar) Steadman
- 208f,w,s,su. **Seminar in Orthodontics.** (Cr and hrs ar) Steadman, Simpson, and staff
- 209f,w,s,su. **Problems and Research in Orthodontics.** (Cr and hrs ar) Steadman
- 210f,w,s,su. **Principles of Orthodontic Retention.** (Cr and hrs ar) Steadman, Simpson, and staff
- 211f,w,s,su. **Advanced Clinical Orthodontic Retention.** (Cr and hrs ar) Steadman, Simpson, and Monson
- 212f,w,s,su. **Orthodontic Prognosis.** (Cr and hrs ar) Steadman, Simpson
- 213f,w,s,su. **Clinical Orthodontic Prognosis.** (Cr and hrs ar) Steadman, Simpson, Monson
- 214f,w,s,su. **Advanced Orthodontic Seminar.** (Cr and hrs ar) Steadman, Simpson

### Periodontics

- 280f,w,s,su. **Advanced Periodontics Clinic.** Practical work in the clinic in examination, diagnosis, treatment planning, and various phases of treatment of periodontal disease. Includes the practice of curettage, gingival resection, splinting of teeth, and balancing the occlusion. (Cr and hrs ar) Schaffer and staff
- 281f,w,s. **Advanced Periodontics Lectures.** Consideration of the tissues involved in periodontal disease. Etiology and treatment of periodontal disease. (3 cr) Schaffer and staff
- 282f,w,s,su. **Research in Periodontics.** Opportunity to take part in the many phases of periodontal research that are under way in the laboratory set up for periodontal research. (Cr and hrs ar) Schaffer and staff
- 283f,w,s. **Seminar in Periodontics.** Etiology of periodontal disease, histopathology of periodontal symptoms, treatment of periodontal disease, research in periodontics. (6 cr) Schaffer and staff
- 284f,w,s. **Supporting Structures of the Teeth.** The histology, pathology, and physiology of the gingival tissues, the cementum, the periodontal membrane, and the alveolar bone will be covered in lectures. Associated problems will be studied on a set of microscopic slides. (3 cr) Schaffer and staff
- 285w,su. **Histochemistry of the Normal and Pathologic Periodontium.** (2 cr) Staff
- 286s. **Bacteriology of Periodontal Diseases.** (1 cr) Staff

### Restorative Dentistry

- 220f,w,s,su. **Advanced Dental Anatomy.** Under supervision, student assists in teaching and participates in the activities of the Division of Dental Anatomy. He also is assigned special problems in the division. (Cr and hrs ar) Hall
- 240f,w,s,su. **Advanced Technical Restorative Dentistry.** Teaching experience is integrated with technical solution of problems involving application of the theories of indeterminate stresses to the more complex problems of tooth morphology. (Cr and hrs ar) Jensen, Wittich, Yock, Morstad
- 243f,w,s,su. **Advanced Clinical Restorative Dentistry.** Detailed application of clinical techniques provides comprehensive training in restorative dentistry through studies on clinical material, collateral reading, and conferences. Research methods and evaluation of data emphasized. (Cr and hrs ar) Jensen, Wittich, Yock, Morstad
- 247f,w,s,su. **Research Problems in Restorative Dentistry.** Arranged with individual students upon application after a critical review of the current and historical literature pertaining to the problem. (Cr and hrs ar) Crawford, Jensen, Wittich, Yock, Morstad

# Program in Dental Hygiene

## GENERAL INFORMATION

The Program in Dental Hygiene was established to fill the need for workers in the public schools, health departments, hospitals, industrial institutions, and dental offices to do dental prophylactic work and to teach hygiene of the mouth as well as dental health education. This type of preventive work is recognized as being one of the great physical needs of our modern times. A scientific training and cultural background, as thorough as possible in the 2-year program, are aimed to give the student a professional education and point of view to work in the semi-independent capacity the nature of her work demands. The program also includes training in dental assisting and laboratory work, and should make the graduate easily adaptable to the general duties of the private dental office should that be the field of work selected.

The program requires 2 academic years of study and leads to the degree of graduate dental hygienist (G.D.H.). The incorporation of this work in the University makes it possible to teach all the subjects of the curriculum in the appropriate departments, thus assuring the student of a University contact and instructions under the best auspices.

The first year's work deals with preliminary science courses and dental technique. In many respects it corresponds to an academic student program. The second year is designed to prepare the student for prophylactic service in dental offices, hospitals, and clinics, and for the teaching of mouth hygiene in health departments and schools. The dental hygienist must be able to take an active part in dental education and public dental health activities.

After graduation a dental hygienist secures a license to practice by passing the dental hygiene examination required by the state in which she desires to locate. National Boards (written part) are acceptable in a number of states. In all instances she practices under the supervision of a licensed dentist or director of a public health program.

## Admission

Students are admitted to the Program in Dental Hygiene only at the beginning of each fall term.

**Special Requirements**—Applicants for admission to this program must be young women between 18 and 35 years of age. They must be able to pass a satisfactory physical examination given by the University Health Service. One year of high school chemistry is required for entrance and 1 year of high school typing and geometry is advantageous.

## Advanced Standing

Students with advanced standing, who enter the Program in Dental Hygiene, should consult the advisers in dental hygiene when planning their programs. A minimum load of 15 credits each quarter is required.

Two academic years in residence are required for completing the Program in Dental Hygiene.

## Arts and Dental Hygiene

A program leading to the degrees of graduate dental hygienist and bachelor of arts may be arranged by consulting the dean of the College of Science, Literature,

and the Arts. This may be done either before entering or after completing the Program in Dental Hygiene. Liberal arts courses taken while in the School of Dentistry or elsewhere may be applied toward these graduation requirements. Usually, 2 or 3 additional years of work are required.

### Application Procedure

All inquiries, credentials, and applications for admission to the undergraduate colleges should be addressed to the Office of Admissions and Records, University of Minnesota, Minneapolis 14.

Application blanks may be obtained at any Minnesota high school or from the Office of Admissions and Records at the University of Minnesota. All applications should be filed as soon as possible. The closing date for applications is July 1 prior to the fall quarter in which the applicant expects to enroll. Applicants may be required to appear for a personal interview at the discretion of the admissions committee.

An admission certificate will be mailed to each student who has met the requirements. In addition, students entering from other colleges or universities will receive a statement of advanced standing. Instructions for the orientation-registration period will be enclosed with the admission certificate or will be mailed later—about 1 month before the opening of the quarter. Students must present their admission certificates when they report for registration.

### Fees

Tuition fee (per quarter)	
Residents of Minnesota .....	\$ 80.00
Nonresidents .....	220.00
Record service fee (applicable only to students new to the University of Minnesota) .....	1.00
Incidental fee (per quarter) .....	20.00
(For privileges such as the Coffman Memorial Union, the Health Service, and the <i>Minnesota Daily</i> .)	
Graduation fee .....	10.00
Special fees:	
Examination for credit (after first quarter in residence) .....	5.00
Special examination (may be taken only upon approval of appropriate committee) .....	5.00

**Privilege Fees**—The fee for the privilege of late registration or late payment of fees is \$3 through the first week of classes. During the second week the fee is \$5 and after the second week the fee is \$10.

**Part-Time Fees**—Students not registered for the full course will be charged tuition at the rate of \$6.75 per credit for residents, \$18.50 for nonresidents.

### Equipment

The University will furnish the larger pieces of equipment needed for the work in clinic and laboratories, but the student must furnish her own uniforms, caps, white shoes, laboratory and operating instruments, textbooks, and supplies. These instruments and supplies will be needed during the first year and will cost approximately \$75. Lists of the required materials for new students will be available during registration periods.

### Awards

**Louise C. Ball Scholarship and Prize Fund**—Annual scholarship assistance is made available to a qualified graduating senior of the Program in Dental Hygiene,

or a graduate dental hygienist of the University of Minnesota, who wishes to further her education in some other department within the University.

**Sigma Phi Alpha**—National Dental Hygiene Honor Society is represented at Minnesota by Eta Chapter. This society recognizes and honors scholarship, service, and character among dental hygiene students. Not more than 10 per cent of the graduating class is eligible.

## TWO-YEAR PROGRAM IN DENTAL HYGIENE

	Fall Qtr		Winter Qtr		Spring Qtr		Total	
	Cr	Hrs	Cr	Hrs	Cr	Hrs	Cr	Hrs
First Year								
Anat 3—Elementary Anatomy .....	4	55					4	55
MicB 1—Elementary Microbiology .....			4	66			4	66
Engl 1B-2B-3B—Freshman English .....	4	44	4	44	4	44	12	132
DH 7-8-9—Dental Anatomy .....	2	44	2	44	2	44	6	132
DH 21-22—Dental Prophylaxis .....			2	44	2	66	4	110
PhCh 50—Elements of Physiological Chemistry .....	4	44					4	44
Phsl 4—Human Physiology .....					4	44	4	44
Physical Education .....	1½	33	1	22			2½	55
PubH 3—Personal Health .....	2	22					2	22
Biol 1-2—General Biology .....			5	99	5	99	10	198
	17½	242	18	319	17	297	52½	858
Second Year								
DH 40-41-42—Dental Health Education .....	2	55	2	55	2	55	6	165
DH 45-46-47—Assisting in Dentistry .....	2	66	2	66	2	66	6	198
DH 53-54-55—Dental Prophylaxis .....	2	66	2	66	2	66	6	198
DH 56—General Pathology .....	1	11					1	11
DH 57-58-59—Prosthetic Dentistry and Laboratory .....	2	44	2	44	3	66	7	154
DH 60—Oral Pathology and Histology .....			2	22			2	22
DH 62—Dental Roentgenology .....					2	33	2	33
GC 2C—Psychology of Human Development .....	3	33					3	33
PubH 51—Community Hygiene .....			3	33			3	33
PubH 95—Principles of Nutrition .....	3	33					3	33
Soc 1—Introduction to Sociology .....					3	33	3	33
Spch 5—Fundamentals of Speech .....	5	55					5	55
Phel 1—Pharmacology .....			2	33			2	33
PEW 25—Standard and Advanced First Aid .....					2	22	2	22
	20	363	15	319	16	341	51	1023

## DESCRIPTION OF COURSES

### Dental Hygiene (DH)

#### Associate Professor

Ione M. Jackson, G.D.H., B.A., *director*

#### Clinical Instructor

Elizabeth M. Schendel, G.D.H., B.S.

**7-8-9. Dental Anatomy.** *Lectures:* dental nomenclature; special attention to definition, spelling, combining and application of terms used in the various divisions of dentistry; detailed study of all deciduous and permanent teeth including calcification, eruption, decalcification, and shedding; tooth form, function, stress, occlusion; surrounding and investing tissues; anomalies. *Laboratory:* each student is required to make 5 drawings of each permanent tooth, 10 plasticine carvings, 7 wax carvings, and a didactic and wax carving final. (2 cr per qtr; 1 lect hr and 3 lab hrs a wk for 3 qtrs) Hall and staff

**21-22. Dental Prophylaxis.** *Lectures, demonstrations, and practice in scaling and polishing teeth; teaching of oral hygiene and home care of the mouth to patients. Work is introduced by practice on manikins followed by practice on patients in the dental clinic. (2 cr per qtr; 1 lect hr, 3 lab hrs, and 6 clin hrs a week per qtr) Jackson, Schendel*

- 40-41-42. Dental Health Education.** Lecture and recitation course in the preparation and presentation of oral hygiene material for various ages, groups, and occasions. Includes critical analysis of dental literature, audio-visual aids, display and unit projects, and field work in the public schools and community programs. (2 cr per qtr; 1 lect a wk; 6 field visits, project laboratories each qtr for 3 qtrs) Schendel
- 45-46-47. Assisting in Dentistry.** Lectures, demonstrations, and practical experience in surgical and dental assisting in operative dentistry, pedodontics, orthodontics, endodontics, periodontics, denture prosthetics, crown and bridge work, X-ray, and patient admissions. (2 cr per qtr; 6 hrs a wk for 3 qtrs) Staff
- 53-54-55. Dental Prophylaxis.** (Continuation of 21-22) Patient recall, and topical fluoride technique. Teaching of oral hygiene is emphasized. Approximately 180 hours of actual practice on all types of clinical cases must be completed. (2 cr per qtr; 6 hrs a wk for 3 qtrs) Jackson, Schendel
- 56. General Pathology.** Elementary discussion of general pathology including circulatory disturbances, inflammation, and tumors. Special consideration of selected diseases with reference to those affecting the oral cavity. (1 cr; 10 lect) Gorlin and staff
- 57-58-59. Prosthetic Dentistry and Dental Laboratory.** *Prosthetic Dentistry:* Lectures: instruments and materials used in dental prosthetics; impression materials and their manipulation; cast construction; art base construction; and assisting in denture construction. Laboratory: assisting in impression taking; pouring impressions and making casts and models; construction of art bases. *Dental Laboratory:* Lectures: instruments and materials used in the various branches of dentistry; assistant's laboratory duties in such areas as crown and bridge, operative dentistry, orthodontia, etc.; manipulation of waxes, investments, metals, plastics, porcelains and cements; soldering. Laboratory: construction of indirect dies from various materials; wax patterns and castings made for all types of cavity preparations; manipulation of porcelain and plastics; soldering of contact; manipulation of synthetic porcelain and dental cements. (2-2-3 cr; prereq 9; 1 lect a wk for 3 qtrs, 120 lab hrs) Hall and staff
- 60. Oral Pathology and Histology.** Résumé of histology of teeth and oral tissues to provide a background for a more detailed discussion of the special pathology of these tissues. Topics include: facial embryology, dental and periodontal development, dental caries, periodontal diseases, endodontics, and introduction to tumors of dental origin. (2 cr; 16 lect and 6 lab hrs) Gorlin and staff
- 62. Dental Roentgenology.** Series of lectures and demonstrations on the application of Roentgen rays for dental diagnostic purposes. Includes the electrophysics of the apparatus, positioning of the films, angulation of the machine, and processing. (2 cr; 1 lect hr and 2 labs hrs a wk) Petersen

### Anatomy (Anat)

- 3. Elementary Anatomy.** Human gross anatomy including a brief introduction to histology, followed by a more detailed study of the head and neck with special emphasis on the teeth and their investing structures. Lectures, laboratory studies, and demonstrations. (4 cr; 3 lect hrs and 2 lab hrs a wk) Anatomy staff

### Microbiology (MicB)

- 1. Elementary Microbiology.** Principles of bacteriology; general survey of pathogenic bacteria, molds, protozoa, and viruses; elements of immunity; sanitary analysis of water and milk; germicides; bacterial food poisoning. (4 cr; 3 lect and lab hrs a wk for 1 qtr) Staff

### Biology (Biol)

- 1-2. General Biology.** Introduction to living things, both plant and animal, and to major biological concepts. Structure, function, classification, evolution of organisms. (5 cr per qtr; 3 lect hrs and 6 lab hrs a wk for 2 qtrs) Staff

### English (Engl)

- 1B-2B-3B. Freshman English.** Three hours a week of composition and one of literature. Nine themes of exposition a quarter; analysis of readings; training in use of library; selection and use of source materials. One novel and 3 or 4 short stories first quarter; 3 plays and some essays in the second; and a selection of poetry in the third. Lectures, class discussions, recordings, forums, and dramatizations of some plays. (4 cr per qtr; 4 hrs a wk for 3 qtrs) Staff

### Pharmacology (Phcl)

- 1. Pharmacology.** Lecture and laboratory study of drugs relating to the application in dental therapeutics. (2 cr; 1 lect hr and 10 lab hrs a wk for 1 qtr) Holte and staff

### Physical Education (PEW)

Instruction is given in a wide variety of seasonal sports, dance, aquatic, and body conditioning activities. The basis of selection is determined by the "Activity Rating" given by the Health Service and also by the interest of the student. Courses meeting 2 days a week carry 1 credit while those meeting 3 days a week carry 1½ credits. The Program in Dental Hygiene requires posture and one sport activity. Staff

### Physiology (Phsl)

- 4. Human Physiology.** Covers the following subjects from the standpoint of function of the human: circulation, respiration, digestion, excretion, metabolism and nutrition, special senses, nervous system, and endocrines. (4 cr; 3 lect hrs and 1 dem hr a wk; prereq 1 qtr zoology or biology, 1 qtr chemistry) Staff

### Physiological Chemistry (PhCh)

- 50. Elements of Physiological Chemistry.** (a) Brief study of the physical and chemical laws of the composition of matter, chemical compounds, chemical and energy changes; of the ionic theory; of gases, and solutions. (b) Physiological chemistry of gases, water, salts, carbohydrates, fats, and proteins; of the nutritive media; of digestive fluids and digestion; of the metabolism of excretion and excretory products. (4 cr; 4 lect hrs a wk) Carlson and staff

### Psychology (Psy)

- 1-2. General Psychology.** General introduction to the study of human behavior with emphasis on the development of the individual. This course is advised, in place of 2C, for those who are considering a Bachelor's degree. (3 cr per qtr; 3 lect hrs a wk for 2 qtrs) Staff
- GC 2C. Psychology of Human Development.** Human behavior in terms of its origins and unfolding; introduction to the methods and techniques applicable to the scientific study of growth and development. Designed to provide an objective view of the complex individual as he functions in and interacts with a complex environment at various stages during the continuous process of physical and psychological development from conception through maturity. Special attention is given to the implications for the young adult of research findings in such major areas of interest as physical, emotional, personality, and social development. (3 cr; 3 lect a wk for 1 qtr) Staff

### Public Health (PubH)

- 3. Personal Health.** Normal body function; causes and prevention of disease. (2 cr; not open to students who have taken GC 10C) Thomson



- 
- 51. Community Hygiene.** Elementary concepts of development, spread, and prevention of preventable diseases, community programs for their control. (3 cr; not open to students who have taken 4, 50, 52, or 100; prereq 3, or GC 10C) Schuman
- 95. Human Nutrition.** Particular reference to public health. Nutritional values of foods, food utilization and requirements, food management, nutrition education. (3 cr; prereq courses in chemistry and biology or consent of instructor) J Anderson

### **Sociology (Soc)**

- 1. Introduction: Man in Society.** Characteristics of human group life. Analysis of factors associated with development of human group life and man's social environment; structure of the social environment and its influence upon the individual's behavior. (3 cr; 3 lect hrs a wk) Martindale

### **Speech and Theater Arts (Spch)**

- 5. Fundamentals of Speech.** Development of basic skills in speech; voice and action, oral reading, discussion, extemporaneous speaking. (5 cr; 5 lect hrs a wk) Staff

# Program in Dental Assisting

## GENERAL INFORMATION

This program, offered jointly by the School of Dentistry and General College, prepares a young woman to perform a variety of duties as a dental assistant. The student's courses will prepare her to be a receptionist, make appointments, keep books, and assist the dentist at his chair. This program permits a student to accomplish 3 major objectives all in 1 year: (a) a general education, (b) supervised clinical experience, (c) a dental assistant certificate.

Credits earned during this year may also be applied toward requirements for the 2-year associate in arts (A.A.) degree. The additional year of work may be taken either before or after the year in dental assisting. Since the need for trained dental assistants is great, the graduate of this program will find many and varied job opportunities.

### Admission

Applicants for this program will register in General College. Application blanks may be obtained from the local high school or from the Office of Admissions and Records, 105 Administration Building, University of Minnesota, Minneapolis 14. Applicants must be young women between 18 and 35 years of age, and must be able to pass a physical examination given by the University Health Service. A typing requirement must be met and 1 year of high school biology, general science, and bookkeeping is advantageous for admission.

## COURSE OF STUDY IN DENTAL ASSISTING

FALL QUARTER	Cr	Hrs
DA 1X—Oral Anatomy .....	2	33
DA 2X—Chairside Assisting .....	3	33
DA 3X—Clinic I .....	3	110
GC 2A—Psychology in Modern Society .....	5	55
GC 10A—Human Biology .....	3	33
GC 31A—Writing Laboratory .....	3	44
	19	308
WINTER QUARTER		
DA 4X—Bacteriology .....	1	10
DA 5X—Oral Pathology .....	1	10
DA 7X—Clinic II .....	5	165
DA 8X—Dental Therapeutics for Dental Assistants and Hygienists .....	2	20
DA 9X—Dental Roentgenology .....	1	25
DA 12X—Dental Assisting Seminar .....	1	15
GC 10B—Human Biology .....	3	30
GC 16A—Bookkeeping and Accounting Laboratory .....	3	40
GC 31B—Writing Laboratory .....	3	40
	19	355
SPRING QUARTER		
DA 6X—Prosthetic Laboratory Procedures .....	2	44
DA 10X—Office Management .....	1	11
DA 11X—Clinic III .....	5	165
DA 14X—Dental Assisting Seminar .....	1	15
GC 10C—Human Biology .....	3	33
GC 31D—Writing Laboratory .....	3	44
GC 32A—Principles of Oral Communication .....	3	33
	17	345
	55	1008

## COURSE DESCRIPTIONS

### Dental Assisting (DA)

**Professorial Lecturer**

Ainsley T. Thorson, D.D.S.

**Instructor**

Helen M. Tuchner

- 1X. Oral Anatomy and Laboratory Procedures.** Bones, muscles, glands of head and neck. Identification, development, and anatomical description of teeth. Preparation of plaster and waxes. Treatment of impressions and model making. Classification and uses of investing and casting materials. Technics of investment and casting. (2 cr; 1 lect and 1 lab a wk) Hampel and staff
- 2X. Chairside Assisting.** Professional ethics, care of the office, and operating room equipment. Psychology of dealing with children and adult patients, preparation of the patient for operation. Identification, uses, and care of dental instruments, methods of assisting in operative procedures, mixing filling materials. (3 cr) Thorson, Tuchner
- 3X. Clinic I.** (3 cr) Staff
- 4X. Bacteriology.** Morphology, cultural characteristics, and laboratory differentiation of cocci, bacilli, spirilla bacteria. Types and uses of sterilizing agents, methods of sterilization. (1 cr) Thorson
- 5X. Oral Pathology.** Oral and dental anomalies, and classification of cavities. Diseases of the oral mucosa and periodontal tissue. Oral pathology and physiology of deciduous teeth. (1 cr) Thorson
- 6X. Prosthetic Laboratory Procedures.** Properties and uses of impression materials. Modeling compound, alginate, colloid, hydrocolloid, and other materials. Basic prosthetic techniques. (2 cr; 1 lect and 1 lab a wk) Hampel and staff
- 7X. Clinic II.** (5 cr) Staff
- 8X. Dental Therapeutics for Dental Assistants and Hygienists.** Lecture and laboratory study of drugs relating to their application in dental therapeutics. (2 cr; 1 lect hr a wk; 10 hrs dem) Holte
- 9X. Dental Radiography.** Indications and preparation of X-ray examinations. Types of machines and techniques of operation. Types, sizes, uses, and processing of films. (1 cr) Petersen
- 10X. Office Management.** Reception of patients, use of the telephone, arranging appointments, keeping office records, fees and collections, purchasing supplies. (1 cr) Thorson
- 11X. Clinic III.** (5 cr) Staff
- 12X. Dental Assisting Seminar.** Correlated series of lectures based on the clinical approach of the dental assistant to the various fields of dentistry. Lectures as assigned.
- 14X. Dental Assisting Seminar.** Series of lectures to follow, in sequence, DA 12. Lectures as assigned.

### General College (GC)

- 2A. Psychology in Modern Society.** Introduction to the science of human behavior. Examines the research methods which the psychologist uses in observing and drawing conclusions about behavior. Topics include the origin and development of behavior, an analysis of human motives, the place of emotion and conflict in human adjustment, how man learns from his environment, and how individuals differ in their psychological makeup. (5 cr)
- 10A. Human Biology: Fundamental Similarities in the Living World.** A study of the variety and relationship of living organisms serves to illustrate the general principles of biology. Special emphasis is given to man's place in the world of living organisms. Man's embryonic development, heredity, racial characteristics, and evolution are considered. Films and demonstration laboratories supplement the lectures. (3 cr)

- 10B. Human Biology: How the Living Machinery in Man Works.** Operational mechanisms of cells, glands, organs, and systems are integrated in the functioning of man's body as a dynamically balanced whole. (3 cr; prereq 10A)
- 10C. Human Biology: Healthful Living.** Preservation and improvement of health is emphasized. Such topics as cause and prevention of disease, dieting, care of skin and hair, pregnancy, mental health, leading causes of death, and public health are considered. (3 cr)
- 16A. Bookkeeping and Accounting Laboratory.** Instruction in dental office routine and methods; keeping patient records and accounts; ordering supplies; banking; monthly statements and general bookkeeping procedures. (3 cr; 2 lect hrs and 2 lab hrs a wk)  
Donnelly
- 31A. Writing Laboratory: Personal Writing.** To see why and how he uses language, the student studies its history and development, levels of usage and style, and becomes familiar with the dictionary's resources. To enrich his awareness of himself and of his relations with his friends and members of his family, the student will read and write descriptions, character sketches, incidents, autobiographies, friendly letters, and business letters. (3 cr)
- 31B. Writing Laboratory: Organizing Ideas.** In developing skills of reading and writing commonly demanded in university classes, reading material will be taken largely from textbooks and periodicals. Emphasis will be upon detecting central ideas, discovering supporting details, interpreting charts and graphs, and generally developing vocabulary and comprehension. Students will study and write summaries, outlines, and expositions ranging from the instructional or process type to the essay type required in many examinations. (3 cr; prereq 31A)
- 31D. Writing Laboratory: Business Writing.** Not only is the student given practice in writing the kinds of letters necessary for ordinary business transactions but he is asked to write a long business report. Letters of inquiry, order, complaint or adjustment, and application, and the business report are included. There is opportunity for discussion of business ethics and routine office procedure. *Final drafts of letters and reports must be typed.* (3 cr; prereq 31B)
- 32A. Principles of Oral Communication.** Work is planned to aid the student in developing confidence in speech situations. Through observation, study, personality analysis, and participation in various speech activities, the student is shown the close relationship between personality and speech behavior. (3 cr)

Delivery: 9-27-6

*al School*

**1962-1964**

A Clinic Consultation  
at University Hospitals

**Bulletin**

**MINNESOTA**

# UNIVERSITY OF MINNESOTA

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The Board of Regents is composed of The Honorable Charles W. Mayo, M.D., Rochester, First Vice President and Chairman; The Honorable Marjorie J. Howard (Mrs. C. Edward), Excelsior, Second Vice President; The Honorable Daniel C. Gainey, Owatonna; The Honorable Richard L. Griggs, Duluth; The Honorable Bjarne E. Grottum, Jackson; The Honorable Robert E. Hess, White Bear Lake; The Honorable Fred J. Hughes, St. Cloud; The Honorable A. I. Johnson, Benson; The Honorable Lester A. Malkerson, Minneapolis; The Honorable A. J. Olson, Renville; The Honorable Otto A. Silha, Minneapolis; and The Honorable Herman F. Skyberg, Fisher.

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# *Medical School*

## GENERAL INFORMATION

The College of Medical Sciences is one of the major units which comprise the University of Minnesota. Within the College of Medical Sciences are the Medical School, the School of Nursing, and the School of Public Health. All are housed on the Minneapolis Campus of the University in a complex of buildings which includes University Hospitals. The close physical relationship of the Medical School and its associated faculties promotes unusual opportunities for exchanges of professional and scientific information across departmental and college lines. Medical students benefit from close association with students in training in related fields; and the faculty, while primarily concerned with the teaching of medical students, participates in the instruction of students in other schools within the College of Medical Sciences.

A Division of Special Educational Services is responsible for maintaining relationships with prospective students and with the high schools and colleges providing preparatory work. Information concerning careers in the health sciences may be obtained from Dr. Raymond N. Bieter, 126 Millard Hall, University of Minnesota, Minneapolis 14.

## History of the Medical School

The first classes in medicine at the University began in 1888 when 3 of the 4 private or proprietary medical schools in Minneapolis and St. Paul offered their charters and resources to the state. In accepting this offer the Regents assumed responsibility on behalf of the people of the state of Minnesota for medical education. In 1908 the remaining proprietary school was incorporated into the University Medical School; since then there have been no other schools of medicine in Minnesota.

In 1905, money for the construction of a hospital was offered to the University by the executor of a private estate. Various delays were encountered but eventually legislative approval and additional money were obtained. The Elliot Memorial Hospital, the first unit of University Hospitals, was dedicated in 1911. The act of acceptance passed by the Legislature stated that the hospital would belong to and be a part of the University, that indigent residents of Minnesota would receive free care and treatment, and that the hospital would be managed and controlled by the Regents of the University. During negotiations and construction of the Elliot Hospital, the Regents, in 1909, approved the use of a private residence near the campus for hospital use. Additional hospital and medical school buildings have been added along a similar pattern of private donation to the University with control and management by the Regents and with legislative appropriations to supplement the gifts of private donors. These include the Todd Hospital, the Cancer and Christian gifts, Eustis Hospital, Mayo Memorial, Variety Club Heart Hospital, Masonic Memorial Hospital, and Veterans of Foreign Wars Clinical Cancer Research Institute.

University Hospitals, as the clinical units are called collectively, are administered separately from the Medical School but there has always been close co-ordination of activities in patient care, medical education, and research investigation.

With the growth of the Medical School since its early years additional clinical facilities for teaching have been developed in the public and private hospitals of the Twin Cities area. There are approximately 800 beds in University Hospitals

and it is here that teaching is concentrated. However, there are an additional 2,200 beds in nearby hospitals which are available to and are utilized by the Medical School. The main teaching hospitals include Minneapolis General Hospital and the Veterans Administration Hospital in Minneapolis and Ancker Hospital and the Gillette State Hospital for Crippled Children in St. Paul. Many of the full-time staff members of these hospitals are regular faculty members of the Medical School. A number of other hospitals in the Twin Cities have affiliations with the Medical School and these include Mt. Sinai, Northwestern, Miller, and St. Joseph's. There are in excess of 5,000 hospital beds utilized for postgraduate and medical school teaching in this area.

Library facilities have not been neglected by the University in the development of the Medical School and these services are readily available to students and staff at the Walter Library, the main library building on the University campus. The bio-medical section of the University Library is housed in Diehl Hall, immediately adjacent to the Medical School and the Hospitals. The library contains extensive collections of periodical reference material as well as primary source books. A medical historical collection contains several unique items. Departmental libraries supplement the main library collections.

## The Course of Study

In common with essentially all American medical schools, the University of Minnesota offers a comprehensive course of study in basic medical sciences during the first and second years of the curriculum. In the first year the student has an opportunity to study, in depth, the structure and function of the human organism by way of gross and microscopic anatomy, physiology, and physiological chemistry. Special courses acquaint the student with the structure and function of the central nervous system and with embryological development. The laboratory method of instruction is emphasized. Also, the first-year students begin their studies of the emotional, social, and psychological development of the individual.

During the second of the basic science years medical students encounter the changes which occur in the body as a result of disease processes. In microbiology and pharmacology the student is introduced to the study of chemical and biological changes which alter or modify physiological and anatomical functions. The concept of therapeutic alterations in the body is introduced into the student's knowledge and thought about disease states. Instruction in psychological adaptation continues through the second year along with study in the broad fields of public health and preventive medicine with the result that the student enlarges his knowledge of man as a social being.

Instruction in the techniques of physical and laboratory diagnosis begins in the second year of the medical student's career when he attends clinics and meets sick people seeking relief of the symptoms of disease and discomfort. Thus, in the clinics, the student comes face to face with illness and the problems of people who have become ill. Though as yet a doctor-in-training, the second-year medical student observes and assists graduate physicians in the daily exercise of their professional skills.

Throughout these first 2 basic science years the emphasis is on broad and detailed understanding of the human being as a biological individual. Regardless of the student's ultimate choice of a general or specialized medical career, a choice he is rarely able to make before completion of medical school, sound and thorough knowledge of the basic medical sciences is required. The University of Minnesota endeavors to provide such a background for all medical students so that, regardless of choice from the extraordinarily wide fields open to him, the graduate physician will have an adequate background in the fundamentals of medical science.

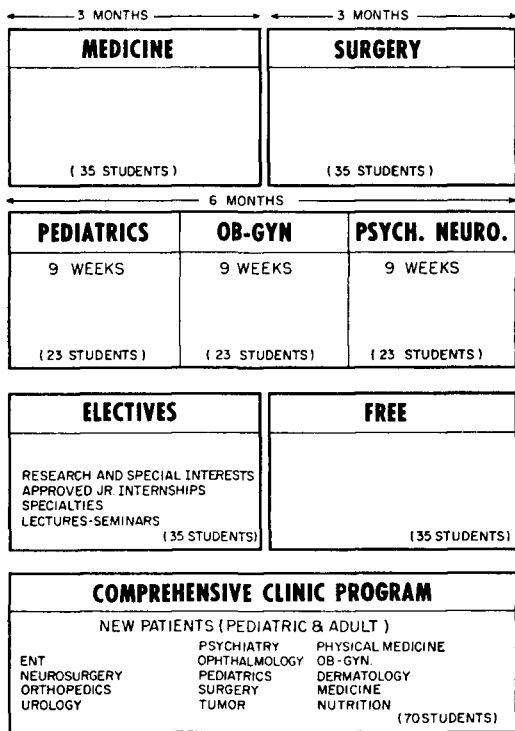


Immediately following 2 academic years, or 6 academic quarters of study, the student embarks on 2 more years of clinical study, during which the focus shifts from the laboratory to the patient. Bedside instruction on hospital wards and in the clinics is now the locus of the student's experiences. It is here, under the guidance of his instructors, that the medical student begins to apply the knowledge and skills he has acquired in the past years. Individual instruction, usually in small groups, replaces the lecture hall. Although there are regular lecture-demonstrations available to the student, he is encouraged to learn from the patients assigned to him and his scheduled time is arranged so that he has opportunity to do so.

**Junior-Senior Biennium**

In June, immediately following completion of the second academic year of the Medical School curriculum, the third-year student enters clinical studies on the hospital wards. Students may be assigned to the University Hospitals or to any of the major associated hospitals such as Ancker, Minneapolis General, or Veterans. On these assignments the student participates in the evaluation of patients both as an exercise in learning and as a member of the clinical team engaged in the treatment of patients.

Diagram of Junior-Senior Biennium in one of several possible variations



The 2-year period is divided into 8 academic quarters of approximately 3 months each, co-ordinated with the all-University quarter schedule. Six of the 8 quarters are required assignments to clinical services with a standard clinical curriculum but the student is asked to register his choice of sequence of clerk-

## LECTURE SCHEDULE

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Summer Quarter	PMed 122 1962-63 and alt. yrs.	Juniors  Obst 120	Med 104 } alt. wks. Ped 120 }	Otol 101 } alt. wks. Oph 100 } 1962-63 and alt. yrs.	Surg 127 (Neuro.)	-----  NPsy 101 (Neurol.) 1963-64 and alt. yrs.
	Anes 101 1963-64 and alt. yrs.			-----		
Fall Quarter	Med 123 (Derm.) 1962-63 and alt. yrs.	Obst 120	Med 104 } alt. wks. Ped 120 }	Otol 101 } alt. wks. Oph 100 } 1962-63 and alt. yrs.	Surg 140 (Ortho.) 1962-63 and alt. yrs.	-----
	Rad 126 1963-64 and alt. yrs.			Rad 126 1963-64 and alt. yrs.	Surg 122 (Fractures) 1963-64 and alt. yrs.	NPsy 101 (Neurol.) 1963-64 and alt. yrs.
Winter Quarter	Med 123 (Derm.) 1962-63 and alt. yrs.	Obst 120	Med 104 } alt. wks. Ped 120 }	Otol 101 } alt. wks. Oph 100 } 1962-63 and alt. yrs.	Surg 129 (General)	-----
	Rad 126 1963-64 and alt. yrs.			Pharm 103 1963-64 and alt. yrs.		NPsy 101 (Neurol.) 1963-64 and alt. yrs.
Spring Quarter	PubH 142 1962-63 and alt. yrs.	Obst 120	Med 104 } alt. wks. Ped 120 }	Otol 101 } alt. wks. Oph 100 } 1962-63 and alt. yrs.	Surg 173 (Urol.)	PubH 142 1962-63 and alt. yrs.
	-----			NPsy 122 (Psych.) 1963-64 and alt. yrs.		NPsy 101 (Neurol.) 1963-64 and alt. yrs.

ships; 1 quarter is a free period, and 1 quarter is set aside as an elective period. Both free and elective quarters may be arranged at any time during the biennium. The student is assigned to internal medicine during 1 quarter, to a surgical service in another quarter. During one 6-month period the student rotates through a sequence which includes pediatrics, obstetrics and gynecology, and psychiatry and neurology. Nine weeks are spent on each of these three services. Finally, the student reports for a 2-quarter or 6-month assignment to the Comprehensive Clinic Program. Except in unusual circumstances, the student will have completed all other clinical services before the Comprehensive Clinic assignment. Free time and the elective period may be chosen at the student's discretion, either before or after the Comprehensive Clinic assignment.

Didactic or lecture room instruction has been reduced to a minimum in the junior-senior biennium. A single afternoon lecture hour for third- and fourth-year classes together provides an opportunity for systematic discussion of clinical topics and the application of basic science subjects as they pertain to clinical medicine.

### *Comprehensive Clinic Program*

Under the direction of Dr. Richard Magraw, director of the Comprehensive Clinic Program, the medical student reaches the culmination of his experience in the care and treatment of patients. For 6 months, 2 consecutive academic quarters, the student's major assignment and responsibility is to organize and actively participate in the complete medical care of patients referred to University Hospitals. The student's role approaches that of an intern in many respects.

Ambulatory patients are assigned to students as they enter the hospital outpatient clinic department. In consultation with the supervisory staff the student plans the diagnostic procedures and treatment of each of his patients for as long as the patient is in attendance at the clinic or is admitted to the hospital. In some instances patients admitted for special diagnostic or treatment procedures are followed by the student throughout the period of hospitalization.

The student-doctor is the patient's clinic-doctor and arranges for return of the patient to the referring physician or agency. Staff and faculty operate as consultants to the student-doctor and his assigned patients. The essential difference between this system and the usual hospital clinic system is that the student-doctor is an active participant with clearly defined responsibility in a doctor-patient relationship rather than an on-looker watching over the shoulder of a staff physician.

In addition, during the comprehensive clinic assignment students work for 3-week periods in specialty clinics where they have an opportunity to acquire further knowledge of medical specialties. These supplementary assignments are arranged so that there is minimum interference with the primary assignment of clinic-doctor.

## **Admission**

### *Academic Requirements*

Admission to the Medical School is based on individual qualifications, the most important of which are apparent aptitude for medical training and potential or proven intellectual ability. Race, sex, color, national origin, and foreign citizenship are not, in themselves, factors in determining eligibility for admission. Residents of Minnesota have certain financial advantages in that they pay lower tuition fees and are eligible for scholarships limited to students of a certain geographical area. However, nonresident students may apply for admission providing they meet the other requirements of the School.

The Medical College Admission Test is required of all applicants.

The School recommends and encourages students to complete a 4-year program and obtain a Bachelor's degree before entering the Medical School. The equivalent of 3 academic years of college course work must be completed before matriculation. In credit hours this is 135 quarter credits or 90 semester hours of college credit. In addition to preparation in physical and biological sciences, the student should prepare himself in liberal arts courses including English, history, psychology, social sciences, and literature, and the outline presented should be recognized as suggesting minimum requirements only. The medical graduate has an increasing responsibility to understand and deal with the social and cultural forces of his environment. Scientific training and background alone are not sufficient to meet this need and studies in the general field of humanities are required.

Beginning with the class entering in September, 1963, physical chemistry, qualitative analysis, genetics, and psychology will no longer be required for admission. Some colleges and universities may require a particular sequence of courses which includes some of these subjects, however. Those students with special interest in basic science subjects or those with aspirations to the Ph.D. in addition to the M.D. are encouraged to pursue their studies at advanced levels in preparation for entering medical school. The table below lists *minimum* course requirements and credits. It is to an applicant's advantage to go beyond these minimums in his college career.

#### MINIMUM REQUIREMENTS

	Approximate Semester Hours	Approximate Quarter Hours
General Biology or Zoology .....	7	10
Chemistry .....	15	22
Inorganic, quantitative, and organic; physical chemistry is recommended.		
English and Literature .....	8	12
Mathematics .....	7	10
College algebra and trigonometry are essential; introductory calculus is strongly recommended.		
Physics .....	8	12
Should cover mechanics, heat, electricity, sound, and light, with laboratory; college algebra and trigonometry must be prerequisite.		
Social Sciences .....	18	27
Introductory psychology is recommended; other liberal arts courses such as history, sociology, economics, philosophy or a modern language may be used to meet this requirement.		
Additional academic courses to bring total credits to required minimums (see above) .....	.....	.....
	90	135

The student is expected to add to the required credit hours indicated in various ways, depending on his own special interests, the requirements of his college, and the counsel of his college adviser. Students applying for a combined medical-graduate degree program or considering a career in academic medicine should proceed beyond the required preparatory courses in the sciences.

Medical School representatives are available in the office of the dean and will be pleased to discuss premedical programs with college students, teachers, and advisers, either in person or through correspondence.

### *Other Admission Requirements and Procedure for Application*

Application forms with detailed instructions for completing the forms may be obtained from the Office of Admissions and Records, University of Minnesota, Minneapolis 14. These forms are available in the spring of the year before the student plans to enter the Medical School; they should not be completed and forwarded to the University before May 15, but must be received before October 1. Since all first-year students begin the 4-year course of medical study in September, the application is made a little more than a year before matriculation. In most instances the student will not have completed his undergraduate studies at the time of application. Two official copies of all college transcripts are required as part of the application. Additional official records of completed courses are to be forwarded as soon as the student's grades are available. Provisional acceptance may be granted depending on satisfactory completion of required courses or other college work in process at the time of application. The applicant may be asked to indicate his plans for completion of additional courses. Nonresidents of Minnesota are asked to pay a fee of \$5 for evaluation of college credentials. This should be forwarded with the application.

Applicants are asked to submit a report of their health status and personal medical history. This is to be completed and forwarded directly by an officer of the Health Service of the student's college. Where this is not possible, the student's physician should complete and forward the form.

Letters of recommendation are an important part of the student's application. Each applicant is asked to supply the names of 3 or 4 persons, not relatives, who will be willing to submit letters. Personal acquaintances and family friends in addition to the student's teachers are particularly suitable since the objective is to obtain information about the student's personal characteristics. It is to an applicant's advantage to select persons who can provide a knowledgeable and detailed report and to obtain permission from the referent before submitting his name. The medical school office writes directly to the person indicated and considers the reply to be confidential.

Several testing procedures are required of all applicants to the University of Minnesota Medical School. These are standard tests of personality characteristics or of aptitude for scientific and medical study. In addition a personal interview may be necessary. With exception of the Medical College Admission Test (MCAT), the admissions office arranges for testing to be done at the student's own college *after* the application form has been returned to the University of Minnesota Medical School. In common with the MCAT, these tests do not measure the individual's factual knowledge but instead they are designed to help the admissions committee learn more about the candidate's aptitudes and suitability for training in medicine. Since the tests do not measure the amount of factual information possessed by the student, attempts to study for them are wasted effort.

**The MCAT**—Premedical students must make individual arrangements for the Medical College Admission Test which is required of all applicants. This test is given throughout the country at many colleges in May and October of each year. Those students planning to enter medical school in September 1963 should plan to take the MCAT in May or October of 1962. This test is administered by The Psychological Corporation and the results of testing are not sent to the student. There is a \$15 fee for the examination which entitles the student to have his scores sent to 3 medical schools. The student is responsible for making arrangements with the testing agency. An announcement booklet giving application deadlines, dates of the tests, sample questions, and instructions as to where the test will be given can be obtained by writing to Medical College Admission Test, The Psychological Corporation, 304 East 45th Street, New York 17, New York.

In accordance with the acceptance procedures approved by the Association of American Medical Colleges, applicants may be notified of the decision of the ad-

missions committee as early as December of the year before matriculation. Accepted candidates will be notified in writing in mid-January of the year they plan to enter the first-year class and candidates have a period of 2 weeks in which to indicate their intention to matriculate. A deposit of \$10, which is applied on tuition fees, is required within 2 weeks of notification to hold the student's place in his class.

### *Foreign Students*

While there is no firm rule against the admission of students trained in other countries, it is strongly recommended that graduates of foreign colleges plan to study at an American university for at least 1 year and preferably 2 years before applying for admission to this Medical School. One or two years of study in the United States will give the foreign student some exposure to the teaching methods of this country, the language, and the general social and cultural environment. Without such acquaintance the foreign student is at a distinct disadvantage in pursuit of a medical education. The foreign student must, of course, provide satisfactory evidence that he has completed the prerequisite course of study required of all other applicants.

The Medical College Admission Test is required and often presents a peculiar problem for the foreign student who is unaccustomed to multiple choice, objective examination procedures. Students should familiarize themselves with the nature and purpose of this type of examination before attempting to take the examinations.

### *Transfers*

Medical students wishing to transfer to the University of Minnesota from other medical schools may be accepted only from medical schools in the United States and Canada and only after completion of the first 2 years of schooling. Students must be in good standing and have the approval of the dean of the medical school which they are attending before transfer will be considered. Transfers from foreign medical schools will not be accepted. (See section on foreign students.) If a student has completed the first and second years of medical school in the United States, is in good standing, and has the consent of his dean, he should arrange for discussion of the transfer with the office of the dean. In most cases the student will be asked to make formal application including transcripts of premedical credits. The psychological aptitude tests required before admission of first-year students are required of transfer students.

Special arrangements are in effect with the medical schools in North and South Dakota who offer training in preclinical or basic science subjects. Students of these schools should consult their dean and the University of Minnesota Medical School office for additional information.

### *Baccalaureate Degree Requirement*

The Medical School and the University require all students to obtain a Bachelor's degree in either arts or sciences before entering the third year of study in the Medical School. Students may qualify for the baccalaureate degree in either of two ways if they have not obtained the degree before admission to Medical School. Some colleges and universities, including the College of Science, Literature, and Arts of the University of Minnesota, award a bachelor of arts to their own students after satisfactory completion of the first year of medical school and providing the student meets distribution requirements and other regulations of the parent college. The bachelor of arts degree is not awarded by the Medical School.

Other students who cannot meet the requirements for the B.A. from their parent school can qualify for the B.S. degree by successful completion of the first

2 years of the medical school curriculum. The B.S. degree is awarded by the College of Medical Sciences.

In some instances a student may qualify for and receive both degrees. In any case the student must plan for either the B.A. or B.S. before entering studies of the clinical years.

## Research Opportunities and Graduate Study Programs

In addition to the prescribed course of study leading to the degree of doctor of medicine there are additional opportunities for qualified students to obtain the Master's and Ph.D. degrees in the medical sciences, and for medical students to conduct research work in either clinical or basic science departments. Medical School facilities are available for original investigations and for students to work with established faculty investigators as assistants and co-workers. The formally established programs are outlined here; other programs of study are arranged individually within the department in which the student's work is to be done.

Nonmedical graduate students register and enroll in the Graduate School of the University. Medical students working for a graduate degree in addition to the degree of doctor of medicine are registered in both the Medical and the Graduate Schools. The *Bulletin of the Graduate School* should be consulted for information on requirements for admission. The combined M.D.-Ph.D. program is especially planned for academically superior medical students with tentative interests in graduate study in a fundamental medical science, leading to a graduate degree (M.S. or Ph.D.) and the M.D. degree. The combined program allows distribution of the student's time between a graduate degree program and the standard medical curriculum, thus extending the period for completion of both doctoral degrees over 6 or more years. The program emphasizes flexibility and adaptability to each student's individual requirements and research interests. Financial support is available to qualified students who spend at least half of their time in any calendar year under Graduate School registration. Stipends for the combined program (a Public Health Service Experimental Training Grant) begin at a level of \$2,800, plus dependency allowances and Graduate School tuition. Students are accepted for the subsidized M.D.-Ph.D. program after completion of the first year of the standard medical school curriculum and on the basis of the quality of the work done during the first year. Application is made through the Medical School office to the Combined Medical-Graduate Program Committee during the winter or spring quarter of the first year. Students must be eligible for admission to the Graduate School in a basic medical science department.

The United States Public Health Service sponsors post-freshman research fellowships for qualified medical students who wish to interpose a full year of research and special study between any 2 years of the medical curriculum. The basic stipend is approximately \$3,000 per year plus dependency allowances.

All of the basic medical science departments conduct active and extensive study programs under the aegis of the Graduate School of the University of Minnesota, leading to the M.S. or Ph.D. degree. Research fellowships, teaching assistantships, or scholarships through United States Public Health Service training grants are available to academically qualified students in all of these fields. Further inquiry should be directed to a faculty member in the basic medical science department of the student's interest or to the appropriate departmental office.

Numerous opportunities for experience in medical research, both basic and clinical, are offered to medical students as 3-month (1-quarter) research fellowships provided from various funds granted to the Medical School and individual departments through federal agencies and voluntary health foundations. Research fellowships may be held during the full summer vacation following the freshman medical year or during the free quarter of the junior-senior biennium. Fellowships are an-

nounced in March from the Medical School office and applications are received during April in the offices of participating departments. These research fellowships are usually granted at \$300 per month for a 3-month (or 1-quarter) period.

Many medical students obtain a stimulating introductory experience in medical research through employment on an hourly or part-time basis during the academic year, or a full-time basis during vacation or free quarters. Such opportunities for employment are arranged individually with faculty members or directors of the Veterans Administration Hospital, Minneapolis General Hospital, and Ancker Hospital. Students in satisfactory academic standing are encouraged to seek these opportunities to supplement their formal medical education and to augment their financial resources as needed.

The Mayo Foundation for Medical Education and Research in Rochester, Minnesota, is affiliated with the Graduate School of the University. Graduate physicians engaged in postdoctoral training and research in Rochester may receive graduate credit for their work and be awarded advanced degrees.

Approximately 450 physicians are enrolled each year in the postdoctoral or residency training programs in the clinical departments of the Medical School and its affiliated hospitals. These doctors are being trained as specialists in their various fields. The majority have qualified for registration in the Graduate School and graduate credit may be obtained for residency training.

For the practicing physician, the Department of Continuation Medical Education organizes and presents brief courses on special topics of current interest. These courses are usually presented in concentrated form over a period of less than 1 week. Medical School faculty participate with visiting lecturers in bringing recent medical advances to registrants in these courses.

## Tuition and Fees

Medical School enrollment at the University of Minnesota Medical School is for 13 academic quarters and tuition is paid quarterly at the rate of \$150 per quarter for residents of Minnesota for the academic year 1962-63. Nonresident tuition is \$310 per quarter. An additional incidental fee of about \$20 per quarter is required of both residents and nonresidents. Students do not pay tuition during the free period of the junior-senior biennium nor are they required to pay tuition if they arrange to spend their elective period at another medical school in this country or abroad.

Books and supplies such as microscopes, stethoscope, and other necessary equipment are provided by the student and the cost is variable. Living expenses are not included; dormitory housing with meals is available to medical students in University-operated residence halls conveniently located near the Medical School.

## Loan Funds, Scholarships, and Prizes

Financial aid to students is available to certain students in the form of regional scholarships, National Defense Loans, special loan funds, and designated prizes. With few exceptions students must be accepted for admission and be regularly enrolled to qualify for these grants. Most financial assistance is administered by the University's Bureau of Student Loans and Scholarships.

Student research fellowships are awarded for vacation or free time work within the Medical School. These fellowships are generous and enable a student to supplement income while pursuing serious medical or basic science research interests. Research fellowships have the added advantage that Medical School facilities and laboratory equipment may be utilized as well as faculty advice and counsel in de-



signing and executing the student's investigative work. Part-time employment may be necessary for some students though the student should be aware that his studies are a full-time obligation. Limited part-time work is available in some departmental research laboratories.

## **Minnesota Medical Foundation**

The Minnesota Medical Foundation, Inc., is a private organization of medical alumni, faculty, students, and friends providing specialized services and supplementary financial support for the Medical School and its programs.

The Foundation, located at the Medical School, annually offers a substantial number of cash scholarships to medical students, based on scholastic achievement and financial need. Amounts are \$500 and higher. It is also administrator of the Herman M. Johnson Memorial Emergency Loan Fund, under a grant from the Minnesota State Medical Association, and offers interest-free loans to students of up to \$200 for 90-day periods to meet critical needs.

Three medical research awards of \$1,200 each are given annually to medical students and others are provided for faculty. The Foundation also issues various types of distinguished teaching awards to faculty members, and provides editorial and circulation management of the University of Minnesota *Medical Bulletin*, official monthly journal of the Medical School. The *Medical Bulletin* is also the official journal of the University of Minnesota Hospitals, the Minnesota Medical Foundation, and the Minnesota Medical Alumni Association.

The Minnesota Medical Foundation has more than 2,000 members. Membership is open to students.

# DESCRIPTION OF COURSES

## Symbols and Explanations

**Symbols**—The following symbols are used throughout the course descriptions and will not carry any page footnotes:

† To receive credit, all courses listed before the single dagger must be completed.

‡ Students may enter sequence course in any quarter which precedes the double dagger.

§ No credit is granted if credit was received for equivalent course listed after section mark.

¶ Concurrent registration is allowed with the course listed after paragraph mark.

‡ Consent of instructor is required.

△ Consent of department or school offering course is required.

## Anatomy (Anat)

Arnold Lazarow, Professor and Head

### Professor

J. Francis Hartmann, Ph.D.  
Arnold Lazarow, M.D., Ph.D.  
Charles F. Morgan, Ph.D.  
R. Dorothy Sundberg, M.D., Ph.D.  
Lemen J. Wells, Ph.D.

### Assistant Professor

Carl B. Heggstad, M.D., Ph.D.  
Morris Smithberg, Ph.D.

### Instructor

Mary J. Buckman, Ph.D.

### Associate Professor

Anna-Mary Carpenter, M.D., Ph.D.  
William J. L. Felts, Ph.D.

## REQUIRED COURSES

- 100f-101w. Gross Human Anatomy.** Dissection, including osteology. (8 cr for 100, 7 cr for 101; prereq regis med fr or grad for 100, 100 for 101)
- 103f-104s. Human Histology.** The microscopic structure, and the cytochemical and functional aspects of cells, tissues, and organs. (4 cr per qtr; prereq regis med fr or Grad for 103, 103 for 104)
- 107w. Human Embryology.** Development of the human body. (4 cr; prereq regis med fr or grad)
- 111s. Neuroanatomy.** Structure and function of the nervous system including the organs of special senses. (5 cr; prereq regis med fr and 103, or grad and 104, or Zool 54)

## ELECTIVE COURSES

- 190. Advanced Anatomy.** Instruction in teaching methods or supervision of student's original research or combination of both. (Cr ar; prereq regis med and 104)

## ADVANCED CREDIT COURSES

- 131f. Biological Electron Microscopy.** (Cr ar; prereq #; offered 1963-64 and alt yrs)
- 132. Experimental Study of the Fetus.** (Cr ar; prereq #)
- 149. Experimental Neurology.** Morphology of the central nervous system as determined by experimental methods. (Cr ar; prereq #)
- 153-154-155-156. Advanced Anatomy.** Gross anatomy, histology, embryology, cytochemistry, hematology, neurology, or experimental morphology. (Cr ar; prereq #)
- 161. Experimental Cytochemistry.** (Cr ar; prereq 103, 104, PhCh 101, #)

- 165-166. **Hematology.** Blood and blood-forming organs; emphasis on blood and bone marrow from the standpoint of diagnosis and prognosis. (4 cr per qtr; limited to 90; prereq 103, or Zool 54 or # for 165...165, # for 166)
- 167. **Seminar: Hematology.** Discussion of literature and research. (1 cr; prereq 166)
- 201, 202, 203, 204. **Research in Anatomy**
- 205, 206, 207. **Seminar: Anatomy**

## Anesthesiology (Anes)

Frederick H. Van Bergen, Professor and Head

**Professor**

- Joseph J. Buckley, M.D., M.S.
- Frederick H. Van Bergen, M.D., M.S.

**Associate Professor**

- James H. Matthews, M.D., M.S.

**Assistant Professor**

- Earl A. Schultz, M.D., M.S.

**Instructor**

- Charles F. Galway, M.D., C.M., M.S.
- John R. Gordon, M.D.
- Edward G. Hustad, M.D.
- Van S. Lawrence, M.D.
- Hugh D. Westgate, M.D., M.S.

**Clinical Instructor**

- Russell W. Bagley, M.D.
- J. Albert Jackson, M.D.
- Byron D. Petersen, M.D.

### REQUIRED COURSES

- 101. **Principles of Anesthesia Lectures.** (1 cr; prereq regis med; offered 1963-64 and alt years)

### ELECTIVE COURSES

- 169. **Research.** (Cr ar; prereq regis med)
- 181. **Externship in Anesthesiology.** (Cr ar; prereq regis med)
- 182. **Externship in Anesthesiology and Respiratory Problems.** (Cr ar; prereq regis med)

### ADVANCED CREDIT COURSES

- 265. **General Anesthesia**
- 266. **Regional Anesthesia**
- 267. **Pre- and Postanesthetic Evaluation**
- 268. **Seminar: Anesthesiology**
- 269. **Research in Anesthesia**

## Laboratory Medicine (LMed)

Gerald T. Evans, Professor and Head

**Professor**

- Ellis Benson, M.D.
- Gerald T. Evans, M.D.C.M., Ph.D.

**Associate Professor**

- Robert Bridges, M.D.
- Ruth Hovde, M.S.
- Newell Ziegler, M.D., Ph.D.

**Assistant Professor**

- Esther Freier, M.D.
- Lorraine Gonyea, M.S.
- Elaine McMaster, M.S.
- Verna Rausch, M.S.

**Instructor**

- Paul Alexander, M.D.
- Kathleen Clayton, B.S.
- Joycelyn Duncan, B.S.
- Patricia Hanauer, B.S.
- Jean Jorgenson, B.S.
- Douglas Nelson, M.D.
- Ann Peterson, B.S.
- Betty A. Ruspino, B.S.
- Edmond Yunis, M.D.

**Clinical Instructor**

- Frances Casey, B.S.
- Marie Dammann, B.S.
- Paul Finley, M.D.
- Aina Galejs, M.D.
- Arthur Sanders, B.A.
- Edward Segal, M.D.

## REQUIRED COURSES

101w-102s. **Clinical Laboratory Medicine.** Methods of laboratory examination for diagnostic purposes. (3 cr per qtr; prereq regis med soph, PhCh 101, Path 101)

## ELECTIVE COURSES

- 180f. **Problems in Fluid and Electrolyte Metabolism A.** (Cr ar; prereq regis med)  
 181w. **Problems in Fluid and Electrolyte Metabolism B.** (Cr ar; prereq regis med)  
 183f. **Topics in Immunology.** (Cr ar; prereq regis med)  
 184. **Problems in Clinical Laboratory Medicine.** (Cr ar; prereq regis med)  
 185s. **Topics in Hematology.** (Cr ar; prereq regis med)

## ADVANCED CREDIT COURSES

235. **Advanced Clinical Laboratory Medicine**  
 236. **Research on Clinical Laboratory Problems**

## Medicine (Med)

Cecil J. Watson, Distinguished Service Professor and Head

*Division of Internal Medicine* — 10

## Professor

Ivan D. Frantz, M.D.  
 Paul S. Hagen, M.D., M.S.  
 Wendell H. Hall, M.D., Ph.D.  
 Frederick W. Hoffbauer, M.D., M.S.  
 Robert B. Howard, M.D., Ph.D.  
 Samuel Schwartz, M.D., Ph.D.  
 Wesley W. Spink, M.D., D.Sc.  
 Cecil J. Watson, M.D., Ph.D.  
 Leslie Zieve, M.D., M.A.

## Clinical Professor

John F. Briggs, M.D.  
 E. P. Fenger, M.D.  
 Arthur C. Kerkhof, M.D., Ph.D.  
 Thomas Lowry, M.D.  
 R. S. Ylvisaker, M.D., M.S.

## Associate Professor

James B. Carey, Jr., M.D., Ph.D.  
 N L Gault, Jr., M.D.  
 Frederick C. Goetz, M.D.  
 B. J. Kennedy, M.D., M.S.  
 Frank M. MacDonald, M.D.  
 Richard M. Magraw, M.D.  
 M. John Murray, M.D.  
 Alvin L. Schultz, M.D.  
 Louis Tobian, Jr., M.D.  
 C. Paul Winchell, M.D.  
 Horace H. Zinneman, M.D.

## Clinical Associate Professor

Donald S. Amatuzio, M.D.  
 Karl W. Anderson, M.D., M.S.  
 Rolf Andreassen, M.D.  
 Reuben Berman, M.D., M.S.  
 Paul J. Bilka, M.D.  
 John J. Boehrer, M.D.  
 Joseph F. Borg, M.D.  
 Sumner S. Cohen, M.D.  
 David M. Craig, M.D.

Richard J. Frey, M.D.  
 Delmar R. Gillespie, M.D.  
 Robert A. Green, M.D.  
 Douglas P. Head, M.D.  
 Howard L. Horns, M.D.  
 Milton M. Hurwitz, M.D., M.S.  
 Wyman E. Jacobson, M.D.  
 John W. LaBree, M.D.  
 Donald McCarthy, M.D.  
 Harold E. Miller, M.D.  
 J. C. Miller, M.D.  
 O. L. Norman Nelson, M.D.  
 Herbert F. R. Plass, M.D., M.S.  
 L. Raymond Scherer, M.D.  
 Horatio B. Sweetser, Jr., M.D.  
 A. Boyd Thomes, M.D.  
 Macnider Wetherby, M.D., Ph.D.  
 Asher A. White, M.D.  
 J. Allen Wilson, M.D., Ph.D.

## Assistant Professor

Arnold Adicoff, M.D.  
 Carl S. Alexander, M.D.  
 Stanley Crosbie, M.D.  
 Alfred Doscherholmen, M.D.  
 Alfred Eichenholz, M.D.  
 Edmund P. Eichhorn, M.D.  
 John W. Jenne, M.D.  
 James P. Lillehei, M.D.  
 Naip Tuna, M.D.  
 Yang Wang, M.D.

## Clinical Assistant Professor

Robert D. Blomberg, M.D.  
 Donald G. Bohn, M.D.  
 James C. Dahl, M.D.  
 Robert E. Doan, M.D.  
 Abraham Falk, M.D.  
 John G. Fee, M.D.  
 William R. Fifer, M.D.  
 Benjamin F. Fuller, Jr., M.D.  
 Albert J. Greenberg, M.D.

Mark C. L. Hanson, M.D.  
 Earl Hill, M.D.  
 William H. Hollinshead, Jr., M.D.  
 John E. Holt, M.D.  
 Wayne L. Hoseth, M.D.  
 Martin E. Janssen, M.D.  
 Herbert W. Johnson, M.D., M.S.  
 David G. Jones, M.D.  
 Walter F. Larrabee, Jr., M.D.  
 George K. Levitt, M.D.  
 Robert E. Lindell, M.D.  
 Charles E. Lindemann, M.D.  
 Russell C. Lindgren, M.D.  
 Paul T. Lowry, M.D.  
 James C. Mankey, M.D.  
 Frank E. Martin, M.D.  
 William F. Mazzitello, M.D.  
 Charles N. McCloud, Jr., M.D., M.S.  
 Burtis J. Mears, M.D.  
 Johannes K. Moen, M.D.  
 James G. Myhre, M.D.  
 Valentine O'Malley, M.D.  
 William E. Petersen, M.D.  
 Fred A. Rice, M.D.  
 Dean K. Rizer, M.D.  
 George C. Roth, M.D.  
 Alan P. Rusterholz, M.D.  
 Joseph M. Ryan, M.D.  
 Andrew W. Shea, M.D.  
 Philip H. Soucheray, M.D.  
 Donald B. Swenson, M.D.  
 Richard B. Tregilgas, M.D.  
 Lowell W. Weber, M.D.  
 A. Cabot Wohlrabe, M.D.

**Instructor**

Richard A. Anderson, M.D.  
 Graham Beaumont, M.D.  
 Thaddeus Chao, M.D.  
 Richard B. Davis, M.D.  
 Mary E. Dempsey, M.D.  
 Richard P. Doe, M.D.  
 Charles F. Fitch, M.D.  
 Joyce L. Funke, M.D.  
 A. Sigrid Gilbertsen, M.D.  
 Leland J. Green, M.D.  
 Frank Hieber, M.D.  
 Maynard E. Jacobson, M.D.  
 Henry A. Johnsen, Jr., M.D.  
 Dennis Kane, M.D.  
 H. Dawes Miller, M.D.  
 Robert Q. Mulhausen, M.D.  
 Frank Q. Nuttall, M.D.

Harold G. Richman, M.D.  
 Russell T. Schultz, M.D.  
 Richard C. Woellner, M.D.

**Clinical Instructor**

Alfred F. Anderegg, M.D.  
 Henry S. Bloch, M.D.  
 Henry S. Blumberg, M.D.  
 Paul F. Bowlin, M.D.  
 Rene Braun, M.D.  
 Robert B. Breitenbucher, M.D.  
 Ephraim B. Cohen, M.D.  
 Henry W. Cohen, M.D.  
 Donald E. Derauf, M.D.  
 John N. Ferguson, M.D.  
 David L. Fingerman, M.D.  
 Stanley Fruchtman, M.D.  
 David Gold, M.D.  
 William L. Hedrick, M.D.  
 Wilbert J. Henke, M.D.  
 Kjeld O. Huseby, M.D.  
 Harold A. Kaplan, M.D.  
 Markle Karlen, M.D.  
 Charles P. Kolars, M.D.  
 Jeanette K. Lowry, M.D.  
 Aaron Mark, M.D.  
 Dwight L. Martin, M.D.  
 James McKenna, M.D.  
 Winston R. Miller, M.D.  
 William D. Nessel, M.D.  
 William F. Nuesse, M.D.  
 William A. O'Brien, M.D.  
 Earl T. Opstad, M.D.  
 William J. Paule, M.D.  
 David A. Randall, M.D.  
 Paul D. Redleaf, M.D.  
 William D. Remole, M.D., M.S.  
 A. MacDonnell Richards, M.D.  
 Rudolph J. Ripple, M.D.  
 Raymond W. Scallen, M.D.  
 Marguerite Schwyzer, M.D.  
 Francis B. Tiffany, M.D.  
 Frank A. Ubel, Jr., M.D.  
 Donald Vellek, M.D.  
 J. A. Vennes, M.D.

**Lecturer**

Henry W. Blackburn, Jr., M.D.

**Clinical Assistant**

Dale H. Correa, M.D.  
 Hugh A. Edmondson, M.D.

**REQUIRED COURSES**

- 101w.s. Physical Diagnosis.** Examination of the normal body; physical diagnosis in disease. Students assigned to cases. (2 cr per qtr; prereq regis med soph, Anat 101, Phsl 107)
- 104. Introduction to Internal Medicine.** Lectures and clinics in the field of internal medicine. (2 cr; prereq 101, LMed 102)
- 112. Clerkship in Internal Medicine.** Supervised study of care of hospitalized patients on an inpatient service. Offered at University and affiliated hospitals with rotation through special services including cardiac, gastrointestinal, chest, metabolic, diabetic, rheumatoid, and peripheral vascular disease. (16 cr; prereq regis med)

**ELECTIVE COURSES**

- 180. Externship.** Care of medical patients on an inpatient service at an advanced level of responsibility. Offered at University and affiliated hospitals. (Cr ar)

181. **Research in Medicine.** Research opportunities in the following areas are available at University or affiliated hospitals: gastroenterology, hypertension and sodium metabolism, lipid metabolism as related to atherosclerosis, liver disease, adrenal disease, carbohydrate metabolism and clinical diabetes, internal medicine. A detailed listing of these opportunities is available in the departmental office. (Cr ar)
184. **Special Clinical Problems.** Opportunities for study in the following areas of clinical interest are available at University or affiliated hospitals: clinical electrocardiography and vectorcardiography, clinical and basic problems in bile pigment and porphyrin metabolism, infectious diseases, endocrinology and metabolic disease including diabetes and thyroid disturbances. A detailed listing of these opportunities is available in the departmental office. (Cr ar)

#### ADVANCED CREDIT COURSES

201. Clinical Medicine  
 202. Diseases of the Cardiovascular Apparatus  
 203. Research in Medicine  
 205. Diseases of the Chest  
 206. Clinical Conference  
 207. Clinical Pathological Conference  
 208. Clinical Radiological Conference  
 210. Seminar: Infectious Disease  
 211. Electrocardiographic Conference  
 212. Pigment Metabolism  
 213. Psychosomatic Medicine

#### *Division of Dermatology*

Francis W. Lynch, Director

##### Professor

Francis W. Lynch, M.D., M.S.

##### Clinical Professor

Carl W. Laymon, M.D., Ph.D.

##### Clinical Associate Professor

Stephen Epstein, M.D.  
 Robert W. Goltz, M.D.  
 John G. Rukavina, M.D.

##### Clinical Assistant Professor

Frederic T. Becker, M.D.  
 I. Fisher, M.D., M.S.  
 Charles Freeman, M.D.  
 Elmer H. Hill, M.D.  
 Harold G. Ravits, M.D.  
 Elmer M. Rusten, M.D.

##### Instructor

Ramon M. Fusaro, M.D.

##### Clinical Instructor

Charles J. Balogh, M.D.  
 Elmer T. Ceder, M.D.  
 Manuel O. Jaffe, M.D.  
 Irvine M. Karon, M.D.  
 Sheldon L. Mandel, M.D.  
 Orville E. Ockuly, M.D., M.S.  
 Milton Orkin, M.D.  
 Nadine C. Smith, M.D.  
 James L. Tuura, M.D.  
 C. Gordon Vaughn, M.D.  
 Alvin S. Zelickson, M.D.

#### REQUIRED COURSES

123. **Dermatology and Syphilology.** Clinical lectures on common skin diseases and syphilis; diagnosis and treatment. (2 cr; prereq 101; offered 1962-63 and alt yrs)

#### ELECTIVE COURSES

182. **Externship in Dermatology.** (Cr ar; prereq regis med)  
 183. **Problems in Dermatology.** (Cr ar; prereq regis med)

#### ADVANCED CREDIT COURSES

225. Clinical Dermatology  
 226. Dermatology  
 227. Histopathology of Skin  
 228. Research: Dermatology and Syphilology

## Microbiology (MicB)

John Spizizen, Professor and Head

### Professor

William F. Scherer, M.D.  
John Spizizen, Ph.D.  
Dennis W. Watson, Ph.D.

Sidney E. Grossberg, M.D.  
Wendell H. Hall, M.D., Ph.D.  
John C. Herweg, M.D.  
G. Albin Matson, Ph.D.  
Palmer Rogers, Ph.D.  
John D. Ross, Ph.D.  
John E. Verna, Ph.D.

### Associate Professor

S. Gaylen Bradley, Ph.D.  
K. Gerhard Brand, M.D.  
Leroy C. McLaren, Ph.D.  
Edwin L. Schmidt, Ph.D.

### Instructor

Ronald W. Hinz, Ph.D.  
James T. Prince, M.S.  
Richard E. Shope, D.V.M.  
Joseph W. St. Geme, M.D.  
Perry E. Treadwell, Ph.D.

### Assistant Professor

Constantine Anagnostopoulos, Ph.D.  
Robert W. Bernlohr, Ph.D.

### REQUIRED COURSES

**105f-106w. Principles of Infectious Disease.** Medical bacteriology, immunology, mycology, and virology; the infectious process. Principles and techniques enabling diagnosis, treatment, and prevention of infectious disease. (6 cr for 105, 5 cr for 106; prereq regis med soph or grad, Anat 103, PhCh 100 or 101 or AgBi 120 for 105...105 for 106) Scherer and staff

### ELECTIVE COURSES

**152f,w,s. Special Problems in Microbiology.** Research opportunities at graduate level for medical students with interest in microbiology. (Cr ar)

### ADVANCED CREDIT COURSES

**110w. Microbial Genetics.** Genetic mechanisms in the bacteria, bacteriophages, fungi, protozoa, and algae. Mutagenesis; selection; adaptation; cytoplasmic inheritance; patterns of genic recombination; fine structure of genetic material. (3 cr; prereq 53 or #; offered 1962-63 and alt yrs) Bradley

**111. Advanced Laboratory.** Techniques employed in study of fundamental techniques in microbiology. Laboratory exercises illustrate isolation, cultivation, and identification of microorganisms. (3 cr; prereq 53 or #) Bradley

**112w. General Mycology.** Physiology; genetics; development; ecology; evolution; taxonomy; economic importance of the yeasts, molds, actinomycetes, and other fungi. (3 cr; prereq 53 or #; offered 1963-64 and alt yrs) Bradley

**116w. Immunology.** Host-parasite interactions; nature of antigens and antibodies; chemical basis of serologic specificity; qualitative and quantitative aspects of antigen-antibody reactions; theories of antibody production; cellular antigens and blood grouping; nature of complement and its role in immunologic phenomena; mechanisms of hypersensitivity; hypersensitivity-like states and immunologic diseases; homo-transplantation and tumor immunity; mechanisms of natural and acquired immunity. (4 cr; prereq 53) Watson

**121f. Physiology of Bacteria.** Chemical and physical structure; staining; growth; influence of environment on growth; nutrition; enzymes; metabolism. (3 cr; prereq 53, 8 cr in organic chemistry or biochemistry) Rogers, Bernlohr

**122w. Physiology of Bacteria Laboratory.** Bacterial physiology and metabolic analysis techniques. (3 cr; prereq 121, or #) Spizizen

**123s. Bacterial Metabolism.** Advanced treatment of metabolism; enzymes; biological energy; fermentation; respiration; nitrogen metabolism. (3 cr; prereq 122, biochemistry or #; offered 1963-64 and alt yrs) Rogers, Bernlohr

**124f. Principles of Virology and Animal Cell Culture.** Lectures on biology of animal cell cultures; nature of viruses and rickettsia; etiology, epidemiology, and laboratory diagnosis of viral and rickettsial infections. (3 cr; prereq 102 or 105 and 116) McLaren, Ross

- 153f,w,s. General Microbiology.** Lectures, demonstrations, and laboratory exercises in morphology, physiology, taxonomy, and ecology of bacteria. Emphasis on practical application of these fundamental principles in other phases of science and industry. (3 cr; prereq 10 cr in chemistry, 4 cr in biological sciences, §) Schmidt, Verna
- 201f,w,s. Research in Microbiology**
- 202f,w,s. Diagnostic Microbiology**
- 203f,w,s. Seminar**
- 206f. Laboratory Methods, Applied Animal Cell Culture and Virology**
- 207f. Research Techniques in Virology and Animal Cell Culture**

## Obstetrics and Gynecology (Obst)

John L. McKelvey, Professor and Head

### Professor

John L. McKelvey, M.D., C.M.

### Associate Professor

Konald A. Prem, M.D., M.S.

### Assistant Professor

Edgar L. Makowski, M.D.

### Clinical Assistant Professor

Alex Barno, M.D.  
 Irving Bernstein, M.D.  
 Claude J. Ehrenberg, M.D.  
 Donald W. Freeman, M.D.  
 John S. Gillam, M.D.  
 Erick Y. Hakanson, M.A.  
 George W. Janda, M.D.  
 Leonard A. Lang, M.D.  
 Mancel T. Mitchell, M.D.  
 David I. Seibel, M.D.  
 William B. Stromme, M.D.  
 Rodney F. Sturley, M.D.

### Instructor

Robert R. Horton, M.D.  
 Fred A. Lyon, M.D.

### Clinical Instructor

Milton Abramson, M.D., Ph.D.  
 James R. Bergquist, M.D.  
 Joseph F. Bicek, M.D.  
 Ray F. Cochrane, M.D.  
 Joseph W. Goldsmith, M.D.  
 John A. Haugen, M.D.  
 Albert F. Hayes, M.D.  
 Eugene M. Kasper, M.D., Ph.D.  
 Harold R. Leland, M.D.  
 Edward C. Maeder, M.D., Ph.D.  
 Owen F. Robbins, M.D.  
 Melvin B. Sinykin, M.D.  
 James J. Swendson, M.D.

### REQUIRED COURSES

- 120. Obstetrics Lectures.** Physiology of pregnancy, labor, and the puerperium. (4 cr per yr; prereq regis med)
- 124w. Introduction to Obstetrics and Gynecology.** (1 cr; prereq regis med soph)
- 135. Clinical Clerkship in Obstetrics and Gynecology.** Includes clinics in obstetrics and gynecology. (12 cr; prereq regis med)

### ELECTIVE COURSES

- 184. Externship in Obstetrics.** (Cr ar; prereq regis med)
- 190. Problems in Obstetrics and Gynecology.** (Cr ar; prereq regis med)

### ADVANCED CREDIT COURSES

- 201-202-203-204. Advanced Obstetrics and Gynecology, Part I**
- 205-206-207-208. Advanced Obstetrics and Gynecology, Part II**
- 209-210-211-212. Advanced Obstetrics and Gynecology, Part III**
- 213-214-215. Staff Conference Seminar**
- 216-217-218-219. Research**
- 221-222-223-224. Clinical Obstetrics and Gynecology**



## Ophthalmology (Oph)

John E. Harris, Professor and Head

### Professor

John E. Harris, M.D., Ph.D.

### Clinical Professor

Walter Fink, M.D.

### Clinical Professor Emeritus

Erling W. Hansen, M.D.

### Clinical Associate Professor

Walter L. Hoffman, M.D., M.S.

John P. Wendland, M.D., M.S.

### Assistant Professor

William L. Fowlks, Ph.D.  
(Ophthalmologic Research)

### Research Associate

Donald F. Clausen, Ph.D.

### Clinical Assistant Professor

Frank Adair, M.D.  
Edward P. Burch, M.D.  
Llewellyn E. Christensen, M.D.  
Robert R. Cooper, M.D.  
Richard C. Horns, M.D., M.S.  
Bourne Jerome, M.D.  
Bruce L. Kantar, M.D., M.S.

Vernon L. Lindberg, M.D.

Malcolm A. McCannel, M.D., M.S.

Robert H. Monahan, M.D.

Karl E. Sandt, M.D.

Virgil J. Schwartz, M.D.

Howard A. Shaw, M.D.

Leander T. Simons, M.D.

George T. Tani, M.D., M.S.

Frederic F. Wippermann, M.D.

### Instructor

Rolando L. Udasco, M.D.

### Clinical Instructor

Wilfred J. Bushard, M.D.

Robert J. Fink, M.D.

Harry S. Friedman, M.D.

Joseph L. Garten, M.D.

Douglas L. Johnson, M.D.

Robert P. Koenig, M.D.

Richard O. Leavenworth, Jr., M.D.

Winston Lindberg, M.D.

John A. McNeill, M.D.

Thomas W. O'Kane, M.D.

Harry L. Plotke, M.D.

Robert E. Rocknem, M.D.

Thomas K. Rucker, M.D.

Irving Shapiro, M.D.

Donald C. Sterner, M.D.

### REQUIRED COURSES

100. **Ophthalmology.** Lectures and demonstrations. (2 cr; prereq regis med; offered 1962-63 and alt yrs)

### ELECTIVE COURSES

180. **Externship in Ophthalmology.** (Cr ar; prereq regis med)

190. **Ophthalmology Research Problems.** (Cr ar; prereq regis med)

### ADVANCED CREDIT COURSES

- 200. **Clinical Ophthalmology**
- 201. **Practical Ocular Surgery**
- 202. **Ocular Pathology Conference**
- 203. **Basic and Applied Ophthalmology**
- 204. **Seminar: Ophthalmology**
- 205. **Neuro Ophthalmology**
- 206. **Refraction**
- 207. **Ocular Muscles**
- 208. **Didactic Ocular Surgery**
- 209. **Pathology of the Eye**
- 210. **Radiology of the Eye, Orbit, and Head**
- 211. **External Diseases**
- 212. **Medical Ophthalmology**
- 213. **Physiologic Optics**
- 214. **Ophthalmology Laboratory**
- 215. **Research in Ophthalmology**

## Otolaryngology (Otol)

Lawrence R. Boies, Professor and Head

### Professor

Lawrence R. Boies, M.D., M.A.  
Henry B. Clark, Jr., D.D.S., M.D.  
Frank M. Lassman, Ph.D.  
(Audiology and Speech)

Bradley Kusske, M.D.  
Douglas R. Kusske, M.D.  
Kurt Pollak, M.D.  
Graham C. Smith, M.D., M.S.  
George M. Tangen, M.D., M.S.  
Harold S. Ulvestad, M.D.

### Clinical Professor

Jerome A. Hilger, M.D., M.S.  
Robert E. Priest, M.D., M.S.

### Instructor

John R. Hilger, M.D.

### Clinical Associate Professor

Conrad Holmberg, M.D.

### Clinical Instructor

Ellis Ellison, M.D.  
Malcolm R. Johnson, M.D.  
Robert Koller, M.D.  
Robert Richardson, M.D.

### Clinical Assistant Professor

Benjamin Bofenkamp, M.D.  
John Glaeser, M.D.

### REQUIRED COURSES

101. Otolaryngology. Lectures and demonstrations. (2 cr per yr; prereq regis med; offered 1962-63 and alt yrs)

### ELECTIVE COURSES

191. Otolaryngology Externship. (Cr ar; prereq regis med)

### ADVANCED CREDIT COURSES

- 230. Clinical Otolary
- 231. Clinical Rhinology, Laryngology
- 232. Surgery of the Ear, Nose, and Throat
- 233. Operative Surgery of the Temporal Bone
- 234. Operative Surgery of the Nose and Throat
- 235. Roentgenology of the Head
- 236. Functional Ear Tests
- 237. Endoscopy
- 238. Pathology of the Ear, Nose, and Throat
- 239. Neurologic Lesions in the Field of Otolaryngology
- 240. Physiotherapy and Surgery of Malignant Diseases of the Ear, Nose, and Throat
- 241. Seminar: Current Literature
- 242. Applied Physiology in Otolaryngology
- 243. Applied Pharmacology in Otolaryngology
- 244. Speech Pathology
- 245. Allergy
- 246. Practical Audiology
- 247. Reconstructive Nasal Surgery

## Pathology (Path)

James R. Dawson, Jr., Professor and Head

### Professor

James R. Dawson, Jr., M.D.  
Franz Halberg, M.D.  
Robert Hebbel, M.D., Ph.D.

### Associate Professor

Herbert M. Hirsch, Ph.D.  
Paul H. Lober, M.D., Ph.D.  
Lee W. Wattenberg, M.D.

### Clinical Professor

Jesse E. Edwards, M.D.

### Clinical Associate Professor

Nathaniel Lufkin, M.D., M.S.

**Assistant Professor**

Joe I. Coe, M.D.

**Instructor**

Charles R. Chedister, M.D.

Donald F. Gleason, M.D.

Erhard Haus, M.D.

Robert E. Rydell, M.D.

Bertram Woolfrey, M.D.

**Clinical Instructor**

S. Steven Barron, M.D.

Frederick A. Fox, M.D.

Craig Freeman, M.D.

Seymour Handler, M.D.

Ellery James, M.D., M.S.

Alan R. Jay, M.D.

Allen Judd, M.D.

Stanley Lofsness, M.D.

Frederick Lott, M.D.

Robert J. McClellan, M.D.

Martin Segal, M.D.

Thomas T. Semba, M.D.

Walter Subby, M.D.

**REQUIRED COURSES**101f. **General Pathology.** (8 cr; prereq regis med soph or grad)102w. **Special Pathology.** (8 cr; prereq 101 and regis med soph)**ELECTIVE COURSES**150. **Problems in Pathology.** (Cr ar; prereq regis med)**ADVANCED CREDIT COURSES**104. **Autopsies.** (Cr ar; prereq 102)105. **Diseases of the Kidney.** (3 cr; prereq 102)106. **Diseases of the Heart.** (3 cr; prereq 102)107. **Pathology Slide Conference at Veterans Hospital.** (1 cr; prereq 102)109. **Clinical Pathological Conference.** (1 cr; prereq regis med)110. **Seminar: Pathology.** (1 cr per qtr; prereq 102)111. **Conference on Autopsies.** (1 cr per qtr; prereq 102)112. **Diagnosis of Tumors.** (Cr ar; prereq 102)113. **Surgical Pathology.** (Cr ar; prereq 102)114. **Diseases of the Liver.** (1 cr; prereq 102)115. **Advanced Neuropathology.** (Cr ar, §NPsy 150, §NPsy 210)116. **Problems in Neuropathology.** (Cr ar, §NPsy 143; prereq 102)117. **Neuropathology.** (Cr ar, §NPsy 143)118. **Intracranial Neoplasms.** (2 cr, §NPsy 211)119. **Survey of Neuropathology.** Examination of specimens from current autopsies. (Cr ar, §NPsy 151)120. **Diseases of the Lungs.** (1 cr; prereq 102)121. **Diseases of the Alimentary Tract.** (1 cr; prereq 102)122. **Basic Science of Cancer.** (Cr ar)140. **Seminar: Experimental Pathology.** (1 cr)141. **Problems in Experimental Pathology.** (Cr ar)201. **Research**207. **Research in Experimental Pathology.** (Cr ar)**Pediatrics (Ped)**

John A. Anderson, Professor and Head

**Professor**

John A. Anderson, M.D., M.S.

Robert A. Good, M.D., Ph.D.

Robert A. Ulstrom, M.D.

Lewis W. Wannamaker, M.D.

**Clinical Professor**

Bryng Bryngelson, Ph.D.

Hyman S. Lippman, M.D., Ph.D.

Albert V. Stoesser, M.D., Ph.D.

**Associate Professor**

Paul Adams, Jr., M.D.  
Ray C. Anderson, M.D., Ph.D.  
William Krivit, M.D., Ph.D.

**Clinical Associate Professor**

Paul F. Dwan, M.D.  
Harold B. Hanson, M.D.  
David Siperstein, M.D., M.A.  
Robert L. Wilder, M.D.

**Assistant Professor**

Elia Ayoub, M.D.  
Barbara Burke, M.D.  
Edward Defoe, M.D.  
Harriet Morgart, M.A.  
Paul Quie, M.D.  
Richard Raile, M.D.  
John Reynolds, M.D.  
Joseph St. Geme, M.D.  
Robert Vernier, M.D.  
Warren Warwick, M.D.

**Lecturer**

Richard Von Korff, Ph.D.

**Clinical Assistant Professor**

Arnold S. Anderson, M.D.  
Stuart L. Arey, M.D.  
Northrop Beach, M.D.  
Eldon B. Berglund, M.D.  
Heinz Bruhl, M.D.  
Paul Ellwood, M.D.  
Harold Flanagan, M.D.  
John J. Galligan, M.D.  
Frank Hedenstrom, M.D.

Elizabeth Lowry, M.D.  
George W. Lund, M.D.  
Edward Nelson, M.D.  
Alfred Ouellette, M.D.  
Theodore Papermaster, M.D.  
Edwin Robb, M.D.  
Robert Rosenthal, M.D.  
Theodore Smith, M.D.  
Willis Thompson, M.D.

**Instructor**

John H. Bornhofen, M.D.  
Robert Fisch, M.D.

**Clinical Instructor**

William Bevis, M.D.  
Alice Brill, M.D.  
Richard T. Cushing, M.D.  
Donnell Etwiler, M.D.  
Clayton R. Green, M.D.  
Evelyn Hartman, M.D.  
William Heilig, M.D.  
George Kimmel, M.D.  
Wallace Lueck, M.D.  
William Mulholland, M.D.  
Lloyd Nelson, M.D.  
Everett Perlman, M.D.  
Frances E. Schaar, M.D.  
Albert Schroeder, M.D.  
Eva Shaperman, M.D.  
Henry Staub, M.D.  
Ellsworth Stenswick, M.D.  
Norman Sterrie, M.D.  
Edward K. Strem, M.D.  
John D. Tobin, M.D.  
Richard Tudor, M.D.

**REQUIRED COURSES**

120. **Clinical Lectures in Pediatrics.** Physical growth and development. Psychological development. Physiology and metabolism. (2 cr per yr; prereq regis med)
135. **Clinical Clerkship in Pediatrics.** Patients on wards assigned to individual students for examination, treatment, and follow-up observation under supervision, including demonstration clinics on contagious and noncontagious diseases. (16 cr; prereq regis med)

**ELECTIVE COURSES**

181. **Externship.** Care of pediatric patients on an inpatient service at an advanced level of responsibility. Offered at University and affiliated hospitals. (Cr ar)
182. **Special Clinical Problems.** Opportunities for study in the following areas of clinical interest are available at University and affiliated hospitals: pediatric cardiology, pediatric neurology, pediatric endocrinology and metabolism; and renal diseases. A detailed listing of these opportunities is available in the departmental office. (Cr ar)
183. **Research in Pediatrics.** Research opportunities in the following areas are available at University or affiliated hospitals: hematology, infectious disease, immunology and inflammatory diseases, renal diseases, metabolic and endocrinologic research. A detailed listing of these opportunities is available in the departmental office. (Cr ar)

**ADVANCED CREDIT COURSES**

200. **Graduate Seminar: Pediatrics**  
202. **Pediatric Clinic**  
204. **Residency in Pediatrics**  
206. **Pediatric Special Interest**  
208. **Pediatric Research**

## Pharmacology (Phcl)

Raymond N. Bieter, Professor and Head

### Professor

Raymond N. Bieter, M.D., Ph.D.  
Harold N. G. Wright, Ph.D.

### Assistant Professor

Elizabeth M. Cranston, Ph.D.

### REQUIRED COURSES

- 101w. Introduction to Pharmacology. (3 cr; prereq regis med soph, Phsl 106, 107 or equiv)  
102s. General and Experimental Pharmacology. Detailed lecture and laboratory study of important drugs. (7 cr; prereq 101, regis med soph)  
103. Clinical Lectures in Pharmacology. (1 cr; offered 1963-64 and alt yrs)

### ELECTIVE COURSES

109. Pharmacological Problems. Experimental study of special topics; review of the literature. (Cr ar; prereq #)  
110. Toxicology. Systemic qualitative toxicological analysis. (Cr ar; prereq #)  
113. Industrial Toxicology. (Cr ar; prereq Δ)

### ADVANCED CREDIT COURSES

111. Advanced Toxicology. Quantitative toxicological analysis. (Cr ar; prereq 110 or ¶110)  
112. Spectrochemical Toxicology. (5 cr; prereq 110)  
124. Pharmacology of Special Systems. More detailed pharmacology of cardiovascular system, autonomic nervous system, etc.; clinical applications. (2 cr; prereq #)  
203. Research in Pharmacology  
204. Advanced Pharmacology  
205. General Discussions in Pharmacology

## Physical Medicine and Rehabilitation (PMed)

Frederic J. Kottke, Professor and Head

### Professor

Frederic J. Kottke, M.D., Ph.D.  
William G. Kubicek, Ph.D.  
Frank M. Lassman, Ph.D.

Ruby G. Overmann, M.A.  
Bror S. Troedsson, M.D.

### Clinical Professor

Miland E. Knapp, M.D.  
Frank Krusen, M.D.

### Instructor

John D. Allison, B.S.  
Marian L. Eliason, B.S.  
Dortha L. Esch, B.S.  
Martin O. Mundale, B.S.  
James F. Pohtilla, B.S.  
Samuel M. Reichel, M.D.  
Gary R. Sampson, D.V.S.  
Helen V. Skowlund, M.S.  
Richard M. Steidl, M.D.

### Associate Professor

Willis Beasley, Ph.D.  
Peter F. Briggs, Ph.D.  
Glenn Gullickson, Jr., M.D.

### Clinical Instructor

Joseph P. Engel, M.D., M.S.  
Michael Kosiak, M.D.  
Richard R. Owen, M.D.  
Arthur B. Quiggle, M.D.  
Herbert A. Schoening, M.D.

### Assistant Professor

Borghild Hansen, B.S.  
Marvin G. Lepley, B.S.  
Romine E. Matthews, Ph.D.  
Wilbur L. Moen, B.S., B.A.

### REQUIRED COURSES

122. Physical Medicine and Rehabilitation. Clinical lectures. (1 cr per yr; offered 1962-63 and alt yrs)

## ELECTIVE COURSES

181. Externship in Physical Medicine and Rehabilitation. (Cr ar; prereq regis med)  
 190. Problems in Physical Medicine and Rehabilitation. (Cr ar; prereq regis med)  
 191. Seminar: Rehabilitation Literature. (Cr ar; prereq regis med)

## ADVANCED CREDIT COURSES

200. Physical Medicine and Rehabilitation Service  
 203. Poliomyelitis Clinic  
 204. Peripheral Vascular Disease Clinic  
 205. Physical Medicine and Rehabilitation Literature Conference  
 206. Conference on Physical Medicine and Rehabilitation  
 210. Research in Physical Medicine  
 211. Electronics in Physical Medicine  
 212. Electromyography

## Physiological Chemistry (PhCh)

Wallace D. Armstrong, Professor and Head

## Professor

Wallace D. Armstrong, M.D., Ph.D.  
 Cyrus P. Barnum, Jr., Ph.D.  
 Paul D. Boyer, Ph.D.  
 Ivan D. Frantz, M.D., Ph.D.  
 Ralph T. Holman, Ph.D.

## Associate Professor

Charles W. Carr, Ph.D.  
 Helmut R. Gutmann, Ph.D.  
 Leon Singer, Ph.D.  
 Frank Ungar, Ph.D.

## Assistant Professor

Curtis H. Carlson, M.D., Ph.D.  
 William O. Caster, Ph.D.  
 James F. Koerner, Ph.D.  
 John F. Van Pilsum, Ph.D.  
 Richard W. Von Korff, Ph.D.

## Lecturer

Quenton T. Smith, Ph.D.

## Instructor

Mary E. Dempsey, Ph.D.

## REQUIRED COURSES

- 100f. Physiological Chemistry. (7 cr; prereq regis med fr, physics, and organic chemistry)  
 101w. Physiological Chemistry. (7 cr; prereq regis med fr, 100)

## ELECTIVE COURSES

153. Problems in Physiological Chemistry. (Cr ar; may be taken 1 or more qtrs; prereq 101)

## ADVANCED CREDIT COURSES

200. Seminar: Physiological Chemistry  
 205. Research in Physiological Chemistry  
 206. Advanced Endocrinology and Steroid Chemistry  
 207. Radiotracers and Mineral Metabolism  
 208. Advanced Laboratory Technique  
 210. Metabolic Enzymology  
 211. Nucleic Acid and Protein Metabolism  
 214. Kinetics and Mechanism of Enzymic Reactions  
 215. Topics in Lipid Metabolism  
 217. Physical Chemistry of Proteins  
 236. Seminar: Radioactive Isotopes

## Physiology (Phsl)

Maurice B. Visscher, Distinguished Service Professor and Head

### Professor

Eugene D. Grim, Ph.D.  
 John A. Johnson, M.D., Ph.D.  
 Joseph T. King, M.D., Ph.D.  
 Nathan Lifson, M.D., Ph.D.  
 Victor Lorber, M.D., Ph.D.  
 Carlos Martinez, M.D., Ph.D.  
 Carlo Terzuolo, M.D.  
 Maurice B. Visscher, M.D., Ph.D.

Charles Edwards, Ph.D.  
 Rodney B. Harvey, M.D., Ph.D.

### Assistant Professor

Robert L. Evans, Ph.D.  
 Irwin J. Fox, M.D., Ph.D.  
 Jui S. Lee, Ph.D.  
 Laurence O. Pilgeram, Ph.D.

### Associate Professor

Marvin Bacaner, M.D.  
 H. Mead Cavert, M.D., Ph.D.

### Instructor

George Wermers, Ph.D.

### REQUIRED COURSES

**106s-107f. Human Physiology.** (7 cr for 106, 8 cr for 107; prereq regis med fr or grad for 106...regis med soph or grad, neuroanatomy, organic chemistry, zoology for 107)

### ELECTIVE COURSES

**113. Problems in Physiology.** Topics assigned for laboratory study, conferences, and reading. (Cr ar; prereq 107)

### ADVANCED CREDIT COURSES

- 112. Hemodynamic Measurements.** Demonstration and laboratory. Use of modern tools for various hemodynamic measurements. (Cr ar; prereq regis med)
- 202. Readings in Physiology**
- 203. Research in Physiology**
- 210. Selected Topics in Permeability**
- 211. Selected Topics in Heart and Circulation**
- 212. Selected Topics in Respiration**
- 215. Selected Topics in Intermediary Metabolism**
- 216. Selected Topics in Neurophysiology**
- 227. Methods in Physiology**
- 230. Topics in General Physiology**
- 231. Topics in General Physiology**
- 232. Immunological Basis of Tissue Transplantation and Related Phenomena**
- 233. Biophysics of Circulation**
- 234. Respiration, Acid-Base Chemistry, and Electrolyte Metabolism**
- 235. Bioenergetics of Cardiac Contraction**
- 236. New Concepts in Physiology of Renal Function**
- 237. Biophysical Aspects of Nerve Function**
- 238. Neural and Humoral Control of Circulation**

## Psychiatry and Neurology (NPsy)

Donald W. Hastings, Professor and Head

### Division of Psychiatry

Donald W. Hastings, Director

#### Professor

Richard W. Anderson, M.D.  
Donald W. Hastings, M.D.  
Robert Hinckley, M.D.  
Burtrum C. Schiele, M.D.  
Werner Simon, M.D.

#### Clinical Professor

S. Alan Challman, M.D.

#### Associate Professor

William Fleeson, M.D.  
Ian Gregory, M.D.  
Carl D. Koutsky, M.D.  
Richard M. Magraw, M.D.  
George E. Williams, M.D.

#### Clinical Associate Professor

Clifford O. Erickson, M.D.  
Walter Gardner, M.D.  
Gove Hambidge, M.D.  
Frank Kiesler, M.D.  
Otto N. Rath, Jr., M.D.  
Clarence J. Rowe, M.D.  
Marvin Sukov, M.D.

#### Assistant Professor

Titus Bellville, M.D.  
G. Wendell Hopkins, M.D.  
William Jepson, M.D.  
Orville Johnson, M.D.

H. Douglas Lamb, M.D.  
Myron Messenheimer, M.D.  
Anthony J. Pollock, M.D.

#### Clinical Assistant Professor

Vera M. Behrendt, M.D.  
Irving Bernstein, M.D.  
Robert Bush, M.D.  
Leslie Caplan, M.D.  
Philip Feinberg, M.D.  
Joyce S. Lewis, Jr., M.D.  
J. Benjamin Lund, M.D.  
David Vail, M.D.

#### Instructor

Ann M. Bailey, M.D.  
Daniel Ferguson, M.D.  
Floyd Garetz, M.D., M.S.  
Ralph Scott, M.D.

#### Clinical Instructor

Jerome Bach, M.D.  
Kenneth Bredezen, M.D.  
Robert Clark, M.D.  
Donald Daggett, M.D.  
Luther Dehnel, M.D.  
George Dorsey, M.D.  
James Garvey, M.D.  
Charles Haberle, M.D.  
Donald Mayberg, M.D.  
John Mulvahill, M.D.  
Jennings Peteler, M.D.  
Ivan Sletten, M.D.

### REQUIRED COURSES

103. Clinical Clerkship in Psychiatry and Neurology. (12 cr; prereq regis med)  
120f,w,s. Basic Behavioral Science. (1 cr per qtr; prereq regis med fr)  
121w,s. Behavior Pathology and Psychiatric Methods. (2 cr per qtr; prereq regis med soph)  
122. Clinical Lectures in Psychiatry. (1 cr; offered 1963-64 and alt yrs)

### ELECTIVE COURSES

191. Externship in Adult Psychiatry. (Cr ar; prereq regis med)  
193. Problems in Psychiatry. (Cr ar; prereq regis med)

### ADVANCED CREDIT COURSES

145. Readings in Psychiatry. (Cr ar)  
171A. Descriptive Psychiatry. (Cr ar)  
251. Clinical Inpatient Psychiatry  
252. Clinical Outpatient Psychiatry  
254. Advanced Clinical Inpatient Psychiatry  
255. Advanced Clinical Outpatient Psychiatry  
257. Special Assignments  
258. Research



- 260. Orientation to Clinical Psychiatry
- 262. Techniques of Clinical Observation and Evaluation
- 264. Descriptive Psychopathology
- 265. Personality Development and Psychodynamics
- 266. Therapeutic Dynamics in Hospital Psychiatry
- 269. Introduction to Psychotherapy
- 271. Basic Readings in Psychoanalysis I
- 272. Reconstructive Psychotherapy
- 273. Survey of Psychosomatic Medicine
- 275. Introduction to Collaborative Therapy
- 276. Current Research
- 277. Psychophysiology for Psychiatrists
- 278. The Family and the Community
- 279. Development of Psychiatric Thought
- 281. Readings in Psychoanalysis II
- 283. Seminar: Special Topics
- 290. Psychiatry for Neurologists
- 291. Seminar: Current Literature
- 292. Special Supervision in Psychotherapy
- 293. Problems in Teaching Psychiatry
- 294. Seminar: Advanced Critical Examination of Systems and Theories
- 295. Introduction to Group Therapy

*Division of Neurology*

A. B. Baker, Director

**Professor**

- A. B. Baker, M.D., Ph.D.
- Maynard M. Cohen, M.D., Ph.D.
- Royal C. Gray, M.D., Ph.D.

**Clinical Professor**

- Harold H. Noran, M.D., Ph.D.

**Associate Professor**

- James Berry, Ph.D.
- Joseph A. Resch, M.D.
- Hildred Schuell, Ph.D.
- Fernando Torres, M.D.
- David Webster, M.D.

**Clinical Associate Professor**

- Robert L. Meller, M.D., M.S.
- Zondal Miller, M.D.

**Assistant Professor**

- Michael Blaw, M.D.
- Harold Cohen, Ph.D.
- John Logothetis, M.D.

- Erland R. Nelson, M.D., Ph.D.
- Bernard Sandler, M.D.

**Clinical Assistant Professor**

- Harold Berris, M.D.
- William Chalgren, M.D., Ph.D.
- Ernest Hammes, Jr., M.D.
- Andrew Leembuis, M.D.
- Sidney Shapiro, M.D.
- V. Richard Zarling, M.D.

**Instructor**

- John Bornhofen, M.D.
- Erik Dahl, M.D.
- Milton Ettinger, M.D.
- George Flora, M.D.
- Edward Jimenez-Pabon, M.D.
- James Moriarty, M.D.
- Gilbert Ross, M.D.

**Clinical Instructor**

- Maland Hurr, M.D.
- Robert Stoltz, M.D.

**REQUIRED COURSES**

- 101. Clinical Neurology. Systematic clinics, demonstrations, and lectures. (4 cr; prereq regis med or grad clinical psychology; offered 1963-64 and alt yrs)
- 103. Clinical Clerkship in Psychiatry and Neurology. (12 cr; prereq regis med)

**ELECTIVE COURSES**

- 181. Externship in Neurology. (Cr ar; prereq regis med)
- 182. Problems in Basic and Clinical Neurology. (Cr ar; prereq regis med)

## ADVANCED CREDIT COURSES

143. Problems in Neuropathology. (Cr ar)  
 145X. Readings in Neurology. (Cr ar)  
 171B. Descriptive Neurology. (Cr ar)  
 208. Clinical Neurology  
 209. Research in Neurology  
 210. Advanced Neuropathology  
 211. Intracranial Neoplasms  
 212. Survey of Neuropathology  
 213. Neuropharmacology  
 214. Child Neurology  
 215. Neurological Complications of Internal Disease  
 216. Clinical Neurochemistry  
 217. Neuro-embryology  
 218. Neurological Language Disorders  
 219. Electronics of Neurological Instrumentation  
 220. Advanced Clinical Neurology  
 221. Neurochemistry  
 222. Seizure Mechanisms  
 223. Brain Tumors  
 224. Infectious Diseases of the Nervous System  
 225. Neuro-ophthalmology  
 226. Neurological-Neurosurgical Conference  
 227. Neurological Development  
 228. Research in Neuropathology  
 230. Electroencephalography  
 231. Applied EEG and Myography  
 232. Applied Neuroroentgenology  
 233. Applied Neuropathology  
 238. Neurological Clinical Pathological Conference  
 239. Neuroanatomy  
 240. Neuropathology Conference  
 241. Neuroradiology  
 247. Speech Disorders  
 248. Applied Neurophysiology

*Division of Clinical Psychology*

Starke R. Hathaway, Director

**Professor**

Norman Garnezy, Ph.D.  
 Starke R. Hathaway, Ph.D.  
 Gardner Lindzey, Ph.D.  
 Paul E. Meehl, Ph.D.  
 William Schofield, Ph.D.  
 Robert D. Wirt, Ph.D.

**Associate Professor**

Peter F. Briggs, Ph.D.  
 Gordon Heistad, Ph.D.  
 David T. Lykken, Ph.D.

**Assistant Professor**

John P. Brantner, Ph.D.  
 Harold Gilberstadt, Ph.D.  
 A. Jack Hafner, Ph.D.  
 Manfred Meier, Ph.D.

Reuben Silver, Ph.D.  
 Daniel Wiener, Ph.D.

**Clinical Assistant Professor**

Howard Davis, Ph.D.  
 Guy Miles, Ph.D.

**Instructor**

Thomas Kiresuk, Ph.D.  
 Mary L. Maxwell, Ph.D.  
 Anita Mills, B.A.  
 Robert Petersen, Ph.D.  
 Naomi Quevillon, Ph.D.  
 Murray Reed, Ph.D.  
 Donald Stieper, Ph.D.  
 Zigfrids Stelmachers, B.A.  
 Edward Sulzer, Ph.D.  
 Lyle Wharton, Ph.D.

## ADVANCED CREDIT COURSES

- 201. Clinical Seminar for Psychologists
- 202. Case Conference
- 203. Psychometric Clerkship
- 204. Intermediate Seminar
- 205. Advanced Seminar

*Division of Child Psychiatry*

Reynold A. Jensen, Director

**Professor**

Reynold A. Jensen, M.D.

**Clinical Professor**

Hyman S. Lippman, M.D., Ph.D.

**Clinical Associate Professor**

Harold B. Hanson, M.D.

**Assistant Professor**James Lawton, Jr., M.D.  
Wentworth Quast, Ph.D.**Clinical Assistant Professor**

Leo Hanvik, Ph.D.

**Instructor**

Paul Bransford, M.D.

## ELECTIVE COURSES

- 192. Externship in Child Psychiatry. (Cr ar; prereq regis med)

## ADVANCED CREDIT COURSES

- 253. Clinical Child Psychiatry
- 256. Advanced Clinical Child Psychiatry
- 284. Readings in Child Psychiatry
- 285. Seminar: Current Literature in Child Psychiatry
- 286. Diagnostic and Therapeutic Methods in Child Psychiatry

**Public Health (PubH)**

Gaylord W. Anderson, Professor and Director

(Staff giving instruction to medical students. For complete announcement of staff and courses in Public Health, see *Bulletin of the School of Public Health.*)**Professor**Gaylord W. Anderson, M.D., Dr.P.H.  
Joseph T. Anderson, Ph.D.  
Jacob E. Bearman, Ph.D.  
Richard G. Bond, M.S., M.P.H.  
Herbert M. Bosch, M.P.H.  
Francisco Grande, M.D.  
Ansel Keys, Ph.D.  
Marion I. Murphy, M.P.H., Ph.D.  
Leonard M. Schuman, M.D., M.S.  
Ernst Simonson, M.D.  
Henry L. Taylor, Ph.D.  
Stewart C. Thomson, M.D., Ph.D.**Associate Professor**Harry Foreman, M.D., Ph.D.  
George S. Michaelsen, M.D.**Assistant Professor**Gustave L. Scheffler, B.S.C.E.  
Marion W. Thornton, M.A., Ph.D.  
Ralph O. Wollan, M.P.H.**Lecturer**Robert N. Barr, M.D., M.P.H.  
Henry Bauer, Ph.D.  
Dean S. Fleming, M.D., M.P.H.  
John F. Shronts, M.D., M.P.H.  
Frank L. Woodward, B.E., M.P.H.

## REQUIRED COURSES

(for medical students)

- 90s. **Medical Statistics I.** Frequency proportions and probability; rates, measured variables; chance variation and judgment of significance; association. (3 cr; prereq regis med soph)

- 100s. **Elements of Preventive Medicine and Public Health.** Occurrence and prevention of communicable, degenerative, and industrial diseases; protection of food, water, and milk; maternal and child health. (6 cr; prereq regis med soph)
142. **Medical Economics.** Economic problems of medical and hospital care for community; programs for medical care and health and hospital insurance. (2 cr; 1962-63 and alt yrs)

#### ELECTIVE COURSES

104. **Epidemiology.** (Cr ar; prereq regis med)
106. **Public Health Administration.** (Cr ar; prereq regis med)
123. **Topics in Public Health.** (Cr ar; prereq regis med)
154. **Control of Radiation Hazards.** (Cr ar; prereq regis med)
155. **Introduction to Air Pollution Problems.** (Cr ar; prereq regis med)
200. **Research**

### Radiology (Rad)

Harold O. Peterson, Professor and Head

#### Professor

Donn G. Mosser, M.D., M.S.  
Harold O. Peterson, M.D.

#### Clinical Professor

J. Richards Aurelius, M.D.  
Oscar Lipschultz, M.D.

#### Associate Professor

Joseph Jorgens, M.D., Ph.D.

#### Clinical Associate Professor

Samuel B. Feinberg, M.D.  
Daniel L. Fink, M.D.  
John P. Medelman, M.D.

#### Assistant Professor

Kurt Amplatz, M.D.  
Phil R. Berger, M.D.  
Lewis S. Carey, M.D.  
John F. Dillon, M.D.  
Baruch S. Jacobson, Ph.D.  
Merle Loken, Ph.D.

#### Clinical Assistant Professor

Osmond J. Baggenstoss, M.D.  
Solveig M. Bergh, M.D.  
Chauncey N. Borman, M.D.  
Sewell Gordon, M.D.  
Cyrus O. Hansen, M.D.  
Malcolm B. Hanson, M.D.  
Elmer Paulson, M.D.  
Donald H. Peterson, M.D.

#### Instructor

Norman Blank, M.D.  
Leonard O. Langer, Jr., M.D.  
J. Paul Leonard, M.D.  
Andrew R. Lillie, M.D.  
Paul Selchau, M.D.  
John A. Tobin, M.D.  
Arnolds Veinbergs, M.D.

#### Clinical Instructor

Eugene Ahern, M.D.  
Heino Alari, M.D.  
Manouchehr Azad, M.D.  
Stanford H. Calin, M.D.  
John B. Coleman, M.D.  
Marvin Goldberg, M.D.  
Frank R. E. Gratzek, M.D.  
Bernard Hall, M.D.  
Jule J. Hopperstad, M.D.  
Richard S. Johnson, M.D.  
Robert Kasper, M.D.  
Warren L. Kump, M.D.  
Thomas B. Merner, M.D.  
Harry Mixer, M.D., M.S.  
Leo Nash, M.D., M.S.  
Ames Naslund, M.D.  
Paul C. Olfelt, M.D., M.S.  
Arnold O. Rholi, M.D.  
Norman F. Stone, M.D.  
Richard C. Tucker, M.D.  
Stanley C. VonDrashek, M.D.  
William A. Wilcox, M.D.  
Hugh J. Williams, M.D.

#### REQUIRED COURSES

- 107w. **Biophysics.** (1 cr; prereq regis med fr)
126. **Clinical Lectures in Roentgen Diagnosis and Radiation Therapy.** (3 cr; prereq regis med; offered 1963-64 and alt yrs)

#### ELECTIVE COURSES

180. **Externship in Radiology.** (Cr ar; prereq regis med)
181. **Externship in Diagnostic Radiology.** (Cr ar; prereq regis med)
182. **Externship in Radiation Therapy.** (Cr ar; prereq regis med)

183. Problems in Radiation Biology and Radioactive Isotope Methods. (Cr ar; prereq regis med)  
 184. Problems in Diagnostic Radiology. (Cr ar; prereq regis med)  
 186. Roentgen Technique. (Cr ar; prereq regis med)

#### ADVANCED CREDIT COURSES

102. X-ray Conference. (1 cr; prereq #)  
 111. Medical Roentgenologic Conference. (1 cr)  
 124. Pediatric-Roentgenologic Conference. (1 cr)  
 135. Surgical Roentgenologic Conference. (1 cr)  
 163. Neurosurgical-Roentgenologic Conference. (1 cr)  
 200. Research: Roentgenology  
 202. Cardiovascular Roentgenologic Conference  
 203. Radiological Physics I  
 204. Tumor Clinic Conference  
 205. Research: Radiation Therapy, Nuclear Medicine, Radiobiology  
 206. Roentgenoscopy  
 207. Roentgen, Radium Therapy  
 209. Roentgen Diagnosis  
 210. Roentgen Technique  
 217. Roentgenologic Conference on Chest Diseases  
 218. Seminar: Radiobiology  
 220. Urologic-Roentgenologic Conference  
 236. Seminar: Radioisotope  
 237. Radiological Physics II  
 238. Roentgen-Surgical Pathology Conference  
 240. Radiation Therapy Conference

### Surgery (Surg)

Owen H. Wangensteen, Distinguished Service Professor and Head

#### Division of General Surgery

##### Professor

Claude R. Hitchcock, M.D., Ph.D.  
 William D. Kelly, M.D., Ph.D.  
 C. Walton Lillehei, M.D., Ph.D.  
 Richard L. Varco, M.D., Ph.D.  
 Owen H. Wangensteen, M.D., Ph.D.

##### Clinical Professor

Orwood J. Campbell, M.D., Ph.D.  
 Lyle J. Hay, M.D., Ph.D.  
 Thomas J. Kinsella, M.D., Ph.D.  
 Arnold J. Kremen, M.D., Ph.D.  
 N. Logan Leven, M.D., Ph.D.  
 Charles E. Rea, M.D., Ph.D.

##### Associate Professor

Joe B. Aust, M.D., Ph.D.  
 Edward W. Humphrey, M.D., Ph.D.  
 Richard C. Lillehei, M.D., Ph.D.  
 Fletcher A. Miller, M.D., Ph.D.

John F. Perry, Jr., M.D., Ph.D.  
 Yoshio Sako, M.D., Ph.D.  
 W. Albert Sullivan, M.D., M.S.

##### Clinical Associate Professor

George S. Bergh, M.D., Ph.D.  
 Tague C. Chisholm, M.D.  
 Davitt A. Felder, M.D., Ph.D.  
 L. Haynes Fowler, M.D., M.S.  
 William A. Hanson, M.D.  
 Victor Hauser, M.D.  
 Earl C. Henrikson, M.D., M.S.  
 N. Kenneth Jensen, M.D.  
 Conrad I. Karleen, M.D., D.D.S.  
 Bernard G. Lannin, M.D., Ph.D.  
 Maynard C. Nelson, M.D., M.S.  
 Frederick H. Owens, Jr., M.D.  
 Edward A. Regnier, M.D.  
 Carl O. Rice, M.D., M.S.  
 Willard D. White, M.D.

**Assistant Professor**

Victor A. Gilbertsen, M.D., M.S.  
 Esten O. Lindseth, M.D., Ph.D.  
 Benjamin R. Reiter, M.D.  
 (Surgery and Public Health)  
 Harlan D. Root, M.D., Ph.D.

**Clinical Assistant Professor**

Stuart W. Arhelger, M.D., Ph.D.  
 Samuel G. Balkin, M.D., D.D.S.  
 Coleman J. Connolly, M.D.  
 Leo C. Culligan, M.D.  
 George D. Eitel, M.D.  
 David Gavisser, M.D., M.S.  
 Joseph J. Garamella, M.D., Ph.D.  
 William F. Hartfiel, M.D.  
 Laurence D. Hilger, M.D.  
 Samuel Hunter, M.D., M.S.  
 Frank E. Johnson, M.D.  
 Donald C. MacKinnon, M.D.  
 Stanley R. Maxeiner, Jr., M.D., M.S.  
 Robert F. McGandy, M.D.  
 Daniel J. Moos, M.D.  
 Nathan C. Plimpton, M.D., M.S.  
 Frank Quattlebaum, M.D., M.S.  
 Walter R. Schmidt, M.D.  
 Abbott Skinner, M.D., M.S.  
 Vernon D. Smith, M.D.  
 Bernard J. Spencer, M.D.  
 Lyle Tongen, M.D., M.S.  
 Robert W. Utendorfer, M.D., M.S.  
 Earl G. Yonehiro, M.D., Ph.D.

**Instructor**

Richard A. DeWall, M.D.  
 William Feller, M.D.  
 Henry Gans, M.D.  
 Theodor Grage, M.D.  
 John Haglin, M.D.  
 Stephen L. Richards, M.D.

**Clinical Instructor**

John F. Alden, M.D., M.S.  
 U. Schuyler Anderson, M.S.  
 Frank S. Ankner, M.D.  
 Manuel R. Binder, M.D.  
 John B. Brainard, M.D., M.S.  
 Raymond E. Buirge, M.D., M.S.  
 Merrill D. Chesler, M.D.  
 John A. Culligan, M.D.  
 Charles T. Eginton, M.D., M.S.  
 Edward C. Emerson, M.D.  
 Robert S. Flom, M.D.  
 Leroy J. Fox, M.D.  
 John K. Grotting, M.D., M.S.  
 Donald W. Hannon, M.D.  
 Carter W. Howell, M.D.  
 Clarence V. Kusz, M.D.  
 Lawrence M. Larson, M.D., Ph.D.  
 Louis C. Lick, M.D., M.S.  
 Walter L. Lynn, M.D.  
 Felix A. McParland, M.D.  
 Berton D. Mitchell, M.D.  
 Aaron A. Papermaster, D.D.S.  
 John H. Rosenow, M.D.  
 Horace G. Scott, M.D., M.S.  
 Joseph L. Sprafka, M.D.  
 William E. Stephens, M.D.  
 Rolla I. Stewart, M.D.  
 Jacob H. Strickler, M.D., M.S.  
 John E. Twomey, M.D.  
 Richard J. Webber, M.D.  
 Darrell E. Westover, M.D.

**Clinical Assistants**

Edwin G. Benjamin, M.D.  
 Harold G. Benjamin, M.D.  
 Frank J. Bonello, M.D.  
 Robert P. Caron, M.D.  
 Hamlin A. Mattson, M.D., M.S.  
 Wallace I. Nelson, M.D.

**REQUIRED COURSES**

- 121s. Principles of Surgery. "The Origins of Contemporary Surgical Thought." Antiseptics, asepsis, homostasis, inflammation, process of repair of tissues. (3 cr; prereq regis med soph)  
 129. Clinical Lectures in General Surgery. (1 cr per yr; prereq regis med)  
 135. Clinical Clerkship. (16 cr; prereq regis med)

**ELECTIVE COURSES**

181. Cardiovascular Surgery. (Cr ar; prereq regis med)  
 182. Problems in Clinical Investigation and/or Problems in Experimental Surgery. (Cr ar; prereq regis med)  
 183. Externship in Affiliated Hospital. (Cr ar; prereq regis med)

**ADVANCED CREDIT COURSES**

200. Outpatient Surgery Clinic  
 202. Applied Surgical Anatomy on the Cadaver  
 203. Proctoscopy and Sigmoidoscopy  
 204. Tumor Clinic  
 205. Surgical Diagnosis  
 208. Surgical Service  
 211. Operative Surgery

- 214. Surgical Ward Conference
- 215. Roentgenological-Surgical Conference
- 216. Surgical Research
- 217. Surgical Seminar
- 218. Medical and Surgical Pathological Conference
- 219. Surgical Literature Conference
- 220. Peripheral-Vascular Surgical Clinic-Conference
- 221. Surgery-Physiology Conference

*Division of Neurosurgery*

Lyle A. French, Director

**Professor**

Lyle A. French, M.D., Ph.D.

**Clinical Professor**

Wallace P. Ritchie, M.D., M.S.

**Clinical Associate Professor**

Harold F. Buchstein, M.D., M.S.

**Clinical Assistant Professor**

Paul S. Blake, M.D.  
Robert L. Merrick, M.D.  
Leonard A. Titrud, M.D., Ph.D.

**Instructor**

S. N. Chou, M.D., M.S.

**Clinical Instructor**

J. L. Story, M.D.

**REQUIRED COURSES**

- 127. Clinical Lectures in Neurosurgery. (1 cr per yr; prereq regis med)

**ELECTIVE COURSES**

- 188. Neurosurgery Externship, University Hospitals. (Cr ar; prereq regis med)
- 189. Neurosurgery Externship, Veterans Administration Hospital. (Cr ar; prereq regis med)
- 190. Neurosurgery Investigation. (Cr ar; prereq regis med)

**ADVANCED CREDIT COURSES**

- 262. Outpatient Clinic in Neurosurgery
- 305. Neurosurgical Diagnosis
- 308. Neurosurgical Service
- 311. Operative Neurosurgical Surgery
- 316. Neurosurgical Research
- 318. Neurosurgical Conference

*Division of Orthopedic Surgery*

John H. Moe, Director

**Clinical Professor**

Edward T. Evans, M.D.  
Harry B. Hall, M.D.  
John H. Moe, M.D.

**Clinical Associate Professor**

Richard H. Jones, M.D.  
Malvin Nydahl, M.D.

**Clinical Assistant Professor**

Frank S. Babb, M.D., M.S.  
Lester W. Carlander, M.D.  
Walter Indeck, M.D.

Edward H. Kelly, M.D.  
Donald R. Lannin, M.D., M.S.  
D. Keith Millett, M.D.  
Harvey O'Phelan, M.D.  
Richard Reiley, M.D.  
Frederick G. Rosendahl, M.D.

**Instructor**

Paul M. Arnesen, M.D.  
Robert F. Premer, M.D.

**Clinical Instructor**

Robert M. Barnett, M.D.  
John J. Beer, M.D.

Wesley H. Burnham, M.D.  
 Frederick E. Drill, M.D.  
 Evan S. Ellison, M.D.  
 Meyer Z. Goldner, M.D.  
 Paul O. Gustafson, M.D.  
 John A. Hartwig, M.D.  
 Richard J. Johnson, M.D.

Sheldon M. Lagaard, M.D.  
 Donovan L. McCain, M.D.  
 George E. Nelson, M.D., M.S.  
 Roland F. Neumann, M.D.  
 Irwin F. Schaffhausen, M.D.  
 Ivan Schloff, M.D.

#### REQUIRED COURSES

122. Principles of Diagnosis, Treatment, Prognosis of Fractures, Dislocations. (1 cr; prereq regis med; offered 1963-64 and alt yrs)  
 140. Clinical Lectures in Orthopedic Surgery. (1 cr; prereq regis med; offered 1962-63 and alt yrs)

#### ELECTIVE COURSES

185. Externship in Orthopedic Surgery and Fractures. (Cr ar; prereq regis med)  
 186. Research Problems. (Cr ar; prereq regis med)

#### ADVANCED CREDIT COURSES

401. Orthopedic Conference  
 403. Fractures  
 405. Orthopedic Diagnosis  
 408. Orthopedic Service  
 411. Orthopedic Operative Surgery  
 416. Orthopedic Research  
 418. Pediatric Orthopedics

### *Division of Urology*

C. D. Creevy, Director

#### Professor

C. D. Creevy, M.D., Ph.D.

#### Clinical Professor

Theodore H. Sweetser, M.D.

#### Associate Professor

George Mellinger, M.D.

#### Clinical Associate Professor

Baxter A. Smith, M.D., M.S.

#### Assistant Professor

Milton P. Reiser, M.D., M.S.

#### Clinical Assistant Professor

David M. Anderson, M.D.  
 Samuel S. Bernstein, M.D.  
 Bruce E. Linderholm, M.D.  
 Hugo E. Miller, M.D., M.S.  
 William E. Price, M.D.  
 Richard S. Rodgers, M.D.  
 Edgar A. Webb, M.D.

#### Clinical Instructor

George L. Garske, M.D.  
 Harold A. Reif, M.D., M.S.  
 Edward J. Richardson, M.D.  
 Ragnar T. Soderlind, M.D.

#### REQUIRED COURSES

173. Urology Lecture. (1 cr; prereq regis med)

#### ELECTIVE COURSES

180. Externship in Urology. (Cr ar; prereq regis med)

#### ADVANCED CREDIT COURSES

250. Urological Surgery  
 251. Cystoscopy and Urology Diagnosis  
 252. Urological Conference  
 253. Research: Urology



254. Urological Seminar  
 255. Urological Radiological Conference  
 256. Urological Pathological Conference  
 257. Use of the Artificial Kidney

### *Division of Proctology*

William C. Bernstein, Director

#### Clinical Professor

William C. Bernstein, M.D.

#### Clinical Associate Professor

Howard M. Frykman, M.D.  
 Charles A. Neumeister, M.D.

#### Clinical Assistant Professor

Loren E. Nelson, M.D.  
 Lloyd F. Sherman, M.D.  
 William T. Smith, M.D.  
 Robert J. Tenner, M.D., M.S.

#### Clinical Instructor

Emerson E. Hoppes, M.D.

### COURSES

For course descriptions, see preceding section on General Surgery.

## Interdepartmental Instruction

### *Comprehensive Clinic Program (CoCl)*

Richard Magraw, M.D., Director and Associate Professor of Medicine and Psychiatry  
 Edward Defoe, M.D., Assistant Director and Assistant Professor of Pediatrics

### REQUIRED COURSES

150. **Comprehensive Clinic.** Students in the junior-senior biennium attend Comprehensive Clinic during 2 consecutive quarters near the end of the Medical School career. In the clinic the student is the clinic-doctor and is responsible for patient care as long as his patients are in attendance at the clinic. In addition to this primary assignment, the student services for 3 weeks in each of the specialty clinics: neurosurgery, orthopedics, urology, ophthalmology, dermatology, physical medicine, radiology, and otolaryngology. During the course students are required to submit a paper in the field of public health. Instruction throughout is interdepartmental. (36 cr; prereq regis med)
- Staff: Dermatology Clinic—Ramon Fusaro, M.D., Director  
 ENT Clinic—Kurt Pollak, M.D., Director  
 Eye Clinic—John Harris, M.D., Director  
           Roland Udasco, M.D., Assistant Director  
 Gynecology Clinic—Edgar Makowski, M.D., Director  
 Medicine Clinic—James B. Carey, Jr., M.D., Director  
           Russell Schultz, M.D., Assistant Director  
 Neurology Clinic—James Moriarty, M.D., Director  
 Neurosurgery Clinic—Lyle French, M.D., Director  
           Shelley Chou, M.D., Assistant Director  
 Orthopedics Clinic—Paul Arnesen, M.D., Director  
 Pediatrics Clinic—Edward Defoe, M.D., Director  
           Robert Fisch, M.D., Assistant Director  
 Physical Medicine and Rehabilitation Clinic—Glenn Gullickson, M.D., Director  
 Psychiatry Clinic—Richard Anderson, M.D., Director  
 Surgery Clinic—William Feller, M.D., Director  
 Urology Clinic—Donald Creevy, M.D., Director  
           Milton Reiser, M.D., Assistant Director  
 Public Health—Stewart Thomson, M.D., Professor  
 Radiology—Phil Berger, M.D., Director

## Contributing University Departments

### *School of Chemistry*

Any advanced work given in the School of Chemistry may be elected for credit in the Medical School. Such courses as AnCh 127, 131, 132, 133, 134 on pH and on electrical and spectrophotometric methods of analysis by members of the analytical chemistry staff, PCh 128, 129, 130 on colloid chemistry, PCh 214 on enzyme chemistry, PCh 275 on protein chemistry, and OrCh 142 on the chemistry of natural products are recommended.

For description of these courses see *Bulletin of the Institute of Technology*.

### *Zoology (Zool)*

(For faculty see *Bulletin of the College of Science, Literature, and the Arts*)

- 144. **Medical Entomology.** Arthropods which serve as vectors of pathogenic organisms of man and animals. (3 cr; prereq 15 cr in zoology or entomology, #; lect, lab)
- 145. **Parasitic Protozoa.** Protozoal parasites of man and animals including laboratory diagnosis. (3 cr; prereq 15 cr in zoology, #; lect, lab)
- 146. **Helminthology.** Worm parasites of man and animals. (3 cr; prereq 15 cr in zoology, #; lect, lab)
- 170. **Advanced Genetics.** General laws involved in heredity and variation, exclusive of man. (3 cr; prereq 15 cr in zoology incl 83, or #)
- 171. **Genetics of Speciation.** (3 cr; prereq 15 cr in zoology incl 83, or #)
- 175. **Human Genetics.** Inherited characters in man from standpoint of medicine. (3 cr; prereq 83, #)
- 182. **Experimental Embryology.** Growth, differentiation, and metabolism of developing organisms. (5 cr; prereq 15 cr in zoology incl 50 or 59 or equiv)