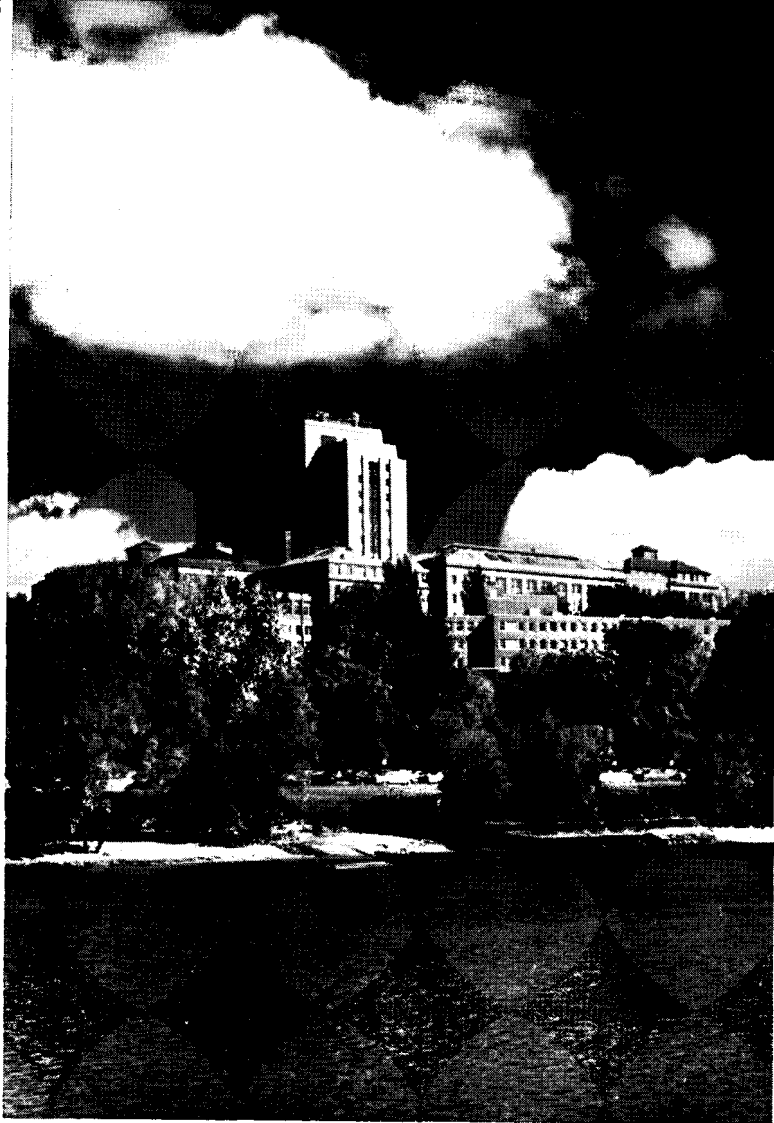


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1964-1966

SCHOOL OF PUBLIC HEALTH

UNIVERSITY OF MINNESOTA BULLETIN

UNIVERSITY OF MINNESOTA

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SCHOOL OF PUBLIC HEALTH

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Harry Foreman, M.D., Ph.D., Associate Professor

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Norman Steere, B.S., Instructor; Safety Engineer, University Health Service

Donald Vesley, M.S., Instructor; Senior Sanitarian, University Health Service

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Russell E. Frazier, B.A., Lecturer; Chief, Section of Engineering Laboratories, Minnesota Department of Health

Velvl W. Greene, Ph.D., Lecturer; Technical Specialist, Litton Systems, Inc., St. Paul

Jack J. Handy, B.S., Lecturer; Director, Environmental Health, Division of Public Health, Minneapolis

Elmer Huset, B.C.E., M.P.H., Lecturer; Chief, Section of Water Supply and General Engineering, Minnesota Department of Health

Warren Lawson, B.Ch.E., M.P.H., M.D., Lecturer; Chief, Section of Radiation and Occupational Health, Minnesota Department of Health

- Joe L. Mogg, M.S., Lecturer; Field Engineer, Edward E. Johnson, Inc., St. Paul
 Raymond L. Schreurs, M.S., Lecturer; Geologist, Edward E. Johnson, Inc., St. Paul
 Elmer C. Slagle, B.S., M.P.H., Lecturer; Assistant Director, Division of Hospital Services, Minnesota Department of Health
 Lyle Smith, M.S., Lecturer; Chief, Section of Water Pollution Control, Minnesota Department of Health
 Robert G. Wissink, M.S., Lecturer; Manager, Radiological Physics Department, Rural Cooperative Power Association, Elk River
 Frank L. Woodward, B.E., M.P.H., Lecturer; Director, Division of Environmental Sanitation, Minnesota Department of Health

Public Health Nursing

- Marion Murphy, M.P.H., Ph.D., Professor; Director of Public Health Nursing
 Ruth von Bergen, B.S., M.P.H., Associate Professor; Co-ordinator, Mental Health Program
 Eleanor M. Anderson, B.S., M.P.H., Assistant Professor
 Clare F. Blanchard, B.S., M.P.H., Assistant Professor
 Delphie Fredlund, B.S., M.P.H., Assistant Professor
 Marie J. McIntyre, M.S., M.S.(Hyg.), Assistant Professor
 Betty W. Bond, M.P.H., Ph.D., Research Associate
 Dorothy Downey, M.S., Instructor
 Marilyn R. Gladitsch, B.S., M.P.H., Instructor
 Mary C. Simons, B.S., Instructor
 Justine J. Speer, M.S., Instructor

Administrative and Educational Staff in Co-operating Field Agencies

- Ruth Abbott, M.S., Lecturer, Staff Development Co-ordinator, Public Health Nursing, Minneapolis Combined Nursing Service, Minneapolis
 Evi Altschuler, M.P.H., Lecturer; Assistant Chief and Educational Director, Section of Public Health Nursing, Minnesota Department of Health
 Hilda Boyle, M.P.H., Lecturer; Director, Rural Hennepin County Nursing District, Minneapolis
 Irene M. Donovan, B.S., Lecturer; Executive Director, St. Paul Family Nursing Service, St. Paul
 Mary Graupman, B.S., Lecturer; Director of Public Health Nursing, Rochester-Olmsted County Health Unit, Rochester
 Margaret Griffin, B.S., Educational Consultant, Family Nursing Service, St. Paul
 Vivian Harriman, M.A., Lecturer; Director of Public Health Nursing, Minneapolis Combined Nursing Service, Minneapolis
 Vera Lundstrom, B.S., Supervisor, Rural Hennepin County Nursing District, Minneapolis
 Alberta Wilson, M.S., Lecturer; Chief, Section of Public Health Nursing, Minnesota Department of Health

Health Education

- Ruth E. Grout, M.P.H., Ph.D., Professor
 Norman A. Craig, B.A., M.P.H., Assistant Professor
 Alloys F. Branton, Jr., M.A., Lecturer; Consultant, Community Health Committee, Community Health and Welfare Council of Hennepin County, Inc.
 Marie E. Ford, B.S., M.P.H., Lecturer; Chief, Section of Health Education, Minnesota Department of Health
 Helen Starr, Ph.D., Lecturer; Director, Health Education, Physical Education, and Recreation, Minneapolis Public Schools

Field Associates

- William A. Allen, M.P.H., Director, Division of Health Education, Philadelphia Department of Public Health
- Marion T. Bryant, M.P.H., Chief, Bureau of Health Education, County of San Diego Department of Public Health, San Diego, California
- K. Elizabeth Burrell, M.P.H., Director, Division of Public Health Education, Montana State Board of Health, Helena, Montana
- Violet DuBois, M.P.H., Director, Division of Health Education, Omaha-Douglas County Health Department, Omaha, Nebraska
- Neola Henson, M.P.H., Health Educator, Rochester-Olmsted County Health Unit, Rochester
- Melvin Lightner, M.P.H., Director of Public Health Education, Des Moines-Polk County Health Department, Des Moines, Iowa
- Binnie L. Manges, M.P.H., Supervising Public Health Educator, St. Louis County Health Department, Clayton, Missouri
- Norbert Reinstein, M.P.H., Program Director, Tuberculosis and Health Society of Wayne County, Detroit, Michigan
- Anthony V. Sinkosky, M.P.H., Public Health Educator, Regional Office, Pennsylvania Department of Health, Reading, Pennsylvania

Personal Health

- Stewart C. Thomson, M.S., M.D., M.P.H., Professor
- Donald W. Cowan, M.S., M.D., Professor; Director, University Health Service
- Murray B. Bates, M.S., M.D., Assistant Professor
- Phillip D. Kernan, M.D., Assistant Professor

Biostatistics

- Jacob E. Bearman, Ph.D., Professor
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- Eugene A. Johnson, Ph.D., Associate Professor
- James R. Boen, Ph.D., Assistant Professor
- Robert Evans, Ph.D., Assistant Professor
- Marian W. Thornton, Ph.D., Assistant Professor
- Constance van Eeden, Ph.D., Assistant Professor
- Alan Treloar, Ph.D., Research Associate
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- Ruth B. Loewenson, M.S., Instructor
- Robert Hiller, M.S., Lecturer

Laboratory of Physiological Hygiene

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- Ernst Simonson, M.D., Professor
- Henry L. Taylor, Ph.D., Professor
- Henry W. Blackburn, M.D., Associate Professor
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- R. Willis Parlin, B.A., Research Associate

Hospital Administration

- James A. Hamilton, M.A., M.C.S., Professor; Director, Program in Hospital Administration
Ray M. Amberg, Ph.C., Professor; Director, University of Minnesota Hospitals
James W. Stephan, M.B.S., Professor; Associate Director, Program in Hospital Administration
E. Gartly Jaco, Ph.D., Associate Professor
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A. Douglas Kincaid, Jr., B.A., Assistant Professor
Theodor J. Litman, Ph.D., Assistant Professor
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Kenneth M. Kelley, B.B.A., M.H.A., Lecturer
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Fred A. McNamara, B.A., Lecturer
Telmer O. Peterson, B.S., M.H.A., Lecturer; President, Northern Pacific Beneficial Association
John Sweetland, Jr., B.A., M.H.A., Lecturer
Bright M. Dornblaser, B.B.A., M.H.A., Clinical Preceptor; Director, Franklin County Public Hospital, Greenfield, Massachusetts
Marie J. Doud, R.N., Clinical Preceptor; Administrator, Highland Hospital, Rochester, New York
Richard E. Fox, Clinical Preceptor; Superintendent, St. Luke's Hospital, Duluth
Frank S. Groner, B.A., LL.D., Clinical Preceptor; Administrator, Baptist Memorial Hospital, Memphis, Tennessee
Alexander Harmon, B.A., M.B.A., Clinical Preceptor; Administrator, Mt. Sinai Hospital, Minneapolis
Kenneth J. Holmquist, M.A., Clinical Preceptor; Superintendent, Bethesda Lutheran Hospital, St. Paul
Lloyd L. Hughes, B.A., LL.B., M.H.A., Clinical Preceptor; Executive Director, Rhode Island Hospital, Providence, Rhode Island
Merton E. Knisely, A.A., Clinical Preceptor; Administrator, St. Luke's Hospital, Milwaukee, Wisconsin
Carl C. Lamley, M.B.S., Clinical Preceptor; Executive Director, Stormont-Vail Hospital, Topeka, Kansas
Matthew F. McNulty, Jr., B.S., M.H.A., M.P.H., Clinical Preceptor; Administrator, University of Alabama Hospital, Birmingham, Alabama
Harold Mickey, B.B.A., Clinical Preceptor; Administrator, Methodist Hospital, Rochester
Robert Millar, B.A., Clinical Preceptor; Administrator, Abbott Hospital, Minneapolis
Russell H. Miller, B.A., M.H.A., Clinical Preceptor; Administrator, University of Kansas Medical Center, Kansas City, Kansas
Robert A. Molgren, B.A., M.H.A., Clinical Preceptor; Administrator, St. Luke's Hospital, Kansas City, Missouri
Wade Mountz, B.A., M.H.A., Clinical Preceptor; Administrator, Norton Memorial Infirmary, Louisville, Kentucky
Russell A. Nelson, M.D., Clinical Preceptor; Director, Johns Hopkins Hospital, Baltimore, Maryland
Stanley R. Nelson, B.S., M.H.A., Clinical Preceptor; Administrator, Northwestern Hospital, Minneapolis

- David E. Olsson, B.S., M.H.A., Clinical Preceptor; Administrator, San Jose Hospital, San Jose, California
- Carl N. Platou, B.A., M.H.A., Clinical Preceptor; Administrator, Fairview Hospital, Minneapolis
- Boone Powell, LL.D., Clinical Preceptor; Administrator, Baylor University Hospital, Dallas, Texas
- Jack W. Rivall, B.A., M.H.A., Clinical Preceptor; Administrator, Eitel Hospital, Minneapolis
- Sr. Mary Madonna, B.A., M.S.S.W., M.H.A., Clinical Preceptor; Administrator, St. Mary's Hospital, Minneapolis
- Kenneth J. Shoos, B.A., Clinical Preceptor; Superintendent, St. Luke's Hospital, Cleveland, Ohio
- Roger R. Starn, B.S., M.H.A., Clinical Preceptor; Administrator, St. Luke's Hospital, St. Paul
- Raymond K. Swanson, B.S., Clinical Preceptor; Superintendent, The Swedish Hospital, Minneapolis
- Richard W. Trenkner, B.B.A., M.H.A., Clinical Preceptor; Administrator, Memorial Hospital of South Bend, South Bend, Indiana
- William N. Wallace, B.A., M.H.A., Clinical Preceptor; Administrator, Charles T. Miller Hospital, St. Paul
- Captain Robert A. Watson, Clinical Preceptor; USAF Hospital, Chanute AFB, Illinois
- Rolland E. Wick, B.A., M.H.A., Clinical Preceptor; Administrator, Children's Hospital, San Francisco, California
- Ray Woodham, B.S., M.H.A., Clinical Preceptor; Administrator, Presbyterian Hospital Center, Albuquerque, New Mexico
- P. David Youngdahl, B.A., M.H.A., Clinical Preceptor; Administrator, Frederick Memorial Hospital, Frederick, Maryland

Special Lecturers, 1962-64

- Ernest A. Ager, M.D., M.P.H., Head, Communicable Disease Control, Washington State Department of Health
- Odin W. Anderson, Ph.D., Research Director, Health Information Foundation, University of Chicago, Illinois
- N. R. Barakat, M.D., Professor of Public Health, Faculty of Medicine, University of Cairo, Egypt
- Clyde Berry, Ph.D., Associate Director, Institute of Agricultural Medicine, College of Medicine, State University of Iowa
- Donald J. Birmingham, M.D., Occupational Health Field Headquarters, Public Health Service, Cincinnati, Ohio
- Alan Brook, Ph.D., Lecturer in Botany, University of Edinburgh, Scotland
- Philip S. Broughton, B.A., Secretary, A. W. Mellon Educational and Charitable Trust, Pittsburgh, Pennsylvania
- William A. Brumfield, M.D., Commissioner of Health, Westchester County, White Plains, New York
- Irene Brzezinski, M.P.H., Health Education Consultant, Tuberculosis Institute of Chicago and Cook County, Chicago, Illinois
- LeRoy E. Burney, M.D., M.P.H., Vice-President of Health Sciences, Temple University
- James D. Caldwell, M.S., Public Health Engineer, Agency for International Development, Washington, D.C.
- Charles E. Carl, M.S., Director, Division of Sanitary Engineering, South Dakota State Health Department
- Ramon Casaprima, Field Engineer, Fairbanks, Morse and Company, Inc., Fair Lawn, New Jersey
- Mayhew Derryberry, Ph.D., former Chief, Health Education and Information Branch, Public Health Service, Washington, D.C.

George Dick, M.D., Department of Microbiology, The Queen's University of Belfast, Ireland

Vivian V. Drenckhahn, M.S., M.P.H., Minneapolis

Frederick K. Erickson, M.S., Associate Regional Health Director for Environmental Health Services, Public Health Service, Kansas City, Missouri

Martha Garst, M.S., Nursing Education Advisor, Agency for International Development, Ethiopia

Richard P. Gaulin, B.S., Mechanical Engineer, Architectural and Engineering Branch, Division of Hospital and Medical Facilities, Public Health Service, Silver Springs, Maryland

Lawrence B. Hall, M.S., Chief, Planetary Quarantine, National Aeronautics and Space Administration, Washington, D.C.

Ann W. Haynes, M.P.H., Chief, Bureau of Health Education, California Department of Public Health, Berkeley, California

August Hoenack, B.Arch., A.I.A., Chief, Architectural and Engineering Branch, Division of Hospital and Medical Facilities, Public Health Service, Washington, D.C.

Mark D. Hollis, D.Sc., Chief Engineer, Pan American Health Organization, Washington, D.C.

Abraham Horwitz, M.D., M.P.H., Director, Pan American Health Organization, Washington, D.C.

George James, M.D., M.P.H., Commissioner of Health, New York City Department of Health, New York

Eugene J. Jungmann, Sales Representative, Bucyrus-Erie Company, Minneapolis

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

Lynford L. Keyes, M.P.H., Chief, Bureau of Health Education, State Board of Health, Springfield, Illinois

Colonel Louis C. Kossuth, M.D., M.P.H., United States Air Force

Harry P. Kramer, M.S., Director, Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio

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

Hugh Leavell, M.D., Dr.P.H., Professor, School of Public Health, Harvard University

A. Helen Martikainen, M.P.H., Chief, Health Education, World Health Organization, Geneva, Switzerland

Charles S. Pineo, B.S., Chief, Community Water Supply Branch, Agency for International Development, Washington, D.C.

Robert D. Ragsdale, M.A., Executive Director, Tuberculosis and Health Association of Hennepin County, Minneapolis

Thomas Roberson, M.S.P.H., Health Education Consultant, Migrant Health Section, Division of Community Health Services, Public Health Service, Washington, D.C.

Dean W. Roberts, M.D., M.P.H., Executive Director, National Commission on Community Health Services, Inc., Bethesda, Maryland

Larry D. Samuels, M.D., Chief of the Midwest Radiation Study, Public Health Service

James Steele, D.V.M., M.P.H., Chief, Veterinary Public Health Section, Communicable Disease Center, Public Health Service, Atlanta, Georgia

James H. Sterner, M.D., Medical Director, Eastman Kodak Company, Rochester, New York

Herbert S. Stokinger, Ph.D., Director, Occupational Health Research, Occupational Health Field Headquarters, Public Health Service, Cincinnati, Ohio

Conrad P. Straub, Ph.D., Chief, Radiological Health, Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio

Myron Wegman, M.D., M.P.H., Dean, School of Public Health, University of Michigan

Dan W. Wilcox, Sales Manager, ACME Fishing Tool Company, Parkersburg, West Virginia

Dorothy Wilson, Ed.D., Executive Director, Community Nursing Service, Philadelphia, Pennsylvania

Franklin D. Yoder, M.D., M.P.H., Director of Public Health, Illinois Department of Public Health

Special Lecturers in Hospital Administration, 1962-64

Kenneth B. Babcock, M.D., Director, Joint Commission on Accreditation of Hospitals, Chicago, Illinois

George Bugbee, B.A., President, Health Information Foundation, Chicago, Illinois

O. J. Campbell, M.D., Surgeon, 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

Richard Crist, President, Minnesota Hospital Service Association, St. Paul

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

Mrs. Russell Hanson, President, Hospital Auxiliary, Benson

Warren B. Hempstead, Physicians' and Hospitals' Supply Company, Inc., Minneapolis

Robert F. Hoffman, B.A., M.H.A., Superintendent, State Hospital, Fergus Falls

Eugene Keating, B.A., LL.B., Attorney at Law, Minneapolis

Lucile P. Leone, M.A., L.D.H., D.Sc., Litt.D., Chief Nurse Officer, Public Health Service, Washington, D.C.

John R. Mannix, Executive Vice President, Blue Cross of Northeast Ohio, Cleveland, Ohio

Walter J. McNerney, B.S., M.H.A., President, Blue Cross Association, Chicago, Illinois

J. P. Medelman, M.D., Radiologist, St. Paul

Andrew Pattullo, B.S., M.B.A., 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

C.J. Rowe, M.D., Psychiatrist, St. Paul

Glen V. Taylor, B.A., Executive Secretary, Minnesota Hospital Association, Minneapolis

David J. Vail, M.D., Medical Director, Minnesota Department of Public Welfare, St. Paul

Donald E. Wood, M.H.A., Executive Director, Twin City Regional Hospital Council, St. Paul

SCHOOL OF PUBLIC HEALTH

GENERAL INFORMATION

The School of Public Health offers a wide selection of general and professional courses in the fields of public health and preventive medicine. The general courses are designed for the student who desires some knowledge of personal health and an understanding of the community programs that exist 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 public health and preventive medicine 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 various professional degree programs in the school are fully accredited by the appropriate national accrediting agencies.

The school occupies two and a half floors of the 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, St. Paul, and Rochester share in teaching responsibilities.

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, public health nutritionists, 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, environmental health, 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, veterinary public health, and public health nutrition are expected to begin during the second term of Summer Session preceeding 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 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 Public Health Service to provide a limited number of stipends for graduate 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 in the supplementary program, 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, and \$250 a month for those with a Bachelor's degree. Under Section 307, stipends are available to graduate nurses in the Master's program at \$250 a month regardless of previously earned degrees.

All stipends are awarded directly by 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, Minnesota 55455.

Students from other countries who desire financial support for their training should apply, through the respective Ministries of Health of their own countries, to the World Health Organization or to the Agency for International Development of the U. S. Department of State for such support. The school has no money which it can award directly to support the training of students from other countries.

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. Funds available through the Children's Bureau provide a special stipend in the area of maternal and child health. Special stipends are also available from the Public Health Service for training in the fields of radiological health, air pollution, hospital engineering, and accident prevention. The amounts of such stipends vary with the field of study. Inquiries should be addressed directly to the school.

Admission

Graduate Program—Those who wish to become candidates for the degrees of master of public health or master of hospital administration should apply directly to the School of Public Health for admission. Application blanks will be furnished by the school upon request. Two certified transcripts 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 students 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 other 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. A special orientation program for foreign students is offered through the Office of the Foreign Student Adviser during the week before fall quarter classes begin.

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 coherent sequence of courses in several 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, environmental health, epidemiology,

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 requirements 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; or

“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, environmental health, and statistics. The courses selected must have the approval of the student’s adviser. An over-all 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 a grade average of 2.5 in the foregoing required courses. Papers of the quality, though not the scope, of a Master’s thesis must be prepared in connection with 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 24.

Bachelor’s Degree—Major in Biostatistics—Registration for courses leading to the bachelor of arts degree with a major in biostatistics is in the College of Liberal 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

(Subject to change)

1. Tuition fee per quarter (except for hospital administration)	
Resident (full schedule)	\$ 91.00
Nonresident (full schedule)	245.00
Resident, per credit hour	7.75
Nonresident, per credit hour	20.50

2. Tuition fee per quarter (hospital administration only)	
Resident (full schedule)	155.00
Nonresident (full schedule)	330.00
Resident, per credit hour	13.00
Nonresident, per credit hour	27.50
3. Records service fee	1.00
4. Incidental fee per quarter	20.00
5. Summer Session, 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
PubH 231 (ground water development—first term Summer Session)	251.00
PubH 232 (ground water development—second term Summer Session)	251.00
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.

Partial Calendar, 1964-66

A few of the pertinent dates of the 1964-65 academic year are as follows:

	Beginning Date	Ending Date
First Term Summer Session 1964	June 15	July 18
Second Term Summer Session 1964	July 20	August 22
Interim Period (PubH 230) 1964	August 24	September 18
Fall Quarter 1964	September 28	December 18
Winter Quarter 1965	January 4	March 19
Spring Quarter 1965	March 29	June 12

The exact dates for the 1965-66 academic year are yet to be determined, but the training periods will be comparable.

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, 100 Wesbrook Hall, University of Minnesota, Minneapolis, Minnesota 55455.

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, Minnesota 55455.

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PROGRAMS OF STUDY

I. Program for Medical Health Officers *-14*

Major Advisers: Gaylord W. Anderson, Leonard M. Schuman, Stewart C. Thomson, Allyn G. Bridge

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

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. Of particular note are the electives available in the fields of epidemiology and maternal and child health. 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 170**—Administration of Public Health Nursing (2)
PubH 107—Maternal and Child Health (3)	PubH 191—Science of Human Nutrition (3)
PubH 114**—Environmental Sanitation Programs (3)	PubH 195—Public Health Aspects of Cardiovascular Disease (3)
PubH 125**—Public Health Education (2)	PubH 210—Seminar: Public Health (1)
PubH 132—Mental Health Program (1)	PubH 215—Maternal and Child Health (ar)
PubH 133—Mental Health (3)	PubH 241—Epidemiology of Noncommunicable Diseases (3)
PubH 140**—Vital Statistics I (3)	Anth 165—Culture and Personality (3)
PubH 141—Economic and Social Aspects of Medical Care (ar)	Pol 131—Public Administration (3)

See page 24 for doctoral program in epidemiology.

2. Programs in Environmental Health *-14*

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

Programs Leading to Master of Public Health or) *12* Master of Science Degree

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 a minimum of 11 months of study. Students should plan to be in attendance for the second summer term preceding the regular academic year, and to remain in attendance during the interim period between the end of second term Summer Session and the beginning of fall quarter.

The several programs that are available provide 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 the areas of water supply, sewerage, general sanitation, sanitary biology, radiological health, air pollution, industrial health, hospital engineering or accident prevention.

Master of Science—The master of science degree, with major emphasis in environmental health, is offered through the Graduate School. Candidates for this degree do not need prior public health experience.

Students planning to continue their studies for the Ph.D. degree, and/or to pursue an academic career of teaching and research in environmental health should consider enrolling in the Graduate School as candidates for the M.S. degree. The program for this degree consists of at least 21 credit hours in environmental health, with elective courses in the candidate's area of special interest. At least 18 credit hours in two or more related fields are also required. Persons interested in this program should consult the environmental health listing in the *Bulletin of the Graduate School*.

Master of Public Health—This degree is available to candidates with 3 years of acceptable public health experience or 1 year of graduate study in a related field. Persons planning to continue public health work with governmental agencies in an administrative or consultative capacity should consider enrolling for the M.P.H. degree. The master of public health program includes all of the core courses in public health and selected electives in the candidate's specialized area of interest.

Recommended Courses

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

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|----------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| PubH 100A,B,C**—Elements of Public Health (5) | PubH 145—Low Level Radioactivity and Radiation Measurements (3) |
| PubH 102**—Environmental Sanitation (3) | PubH 146—Radiological Health II (3) |
| PubH 104**, 105—Epidemiology I and II (6) | PubH 147—Environmental Radioactivity (3) |
| PubH 106**—Public Health Administration (3) | PubH 149—Public Health Aspects of Housing and the Residential Environment (3) |
| PubH 110-111—Biostatistics I and Biostatistics Laboratory (5) | PubH 151—Health Aspects of Air Control in Hospitals (2) |
| PubH 112A,B—Public Health Engineering—Plan Examinations (2) | PubH 152—Industrial Hygiene Engineering (3) |
| PubH 113A,B—Public Health Engineering—Field Investigations (4) | PubH 154—Radiological Health I (3) |
| PubH 115—Food Sanitation (3) | PubH 155—Introduction to Air Pollution Problems (3) |
| PubH 115A—Institutional Food Sanitation (2) | PubH 156—Air Pollution Surveys and Control (3) |
| PubH 116—Public Health Engineering Administration (2) | PubH 157—Radioisotope and Other Radiation Facilities (2) |
| PubH 117,118,119—Sanitary Biology (9) | PubH 158—Hospital Safety (3) |
| PubH 120,121,130,131—Biostatistics II and III (with laboratory) (10) | PubH 159—Chemical Laboratory Safety (1) |
| PubH 123—Topics in Public Health (ar) | PubH 170A**—Administration of Public Health Nursing (1) |
| PubH 125**—Public Health Education (2) | PubH 180**—Introduction to Biostatistics (6) (110 and 111 or 140 may be substituted) |
| PubH 126—Occupational Health Program (3) | PubH 185—Air Analysis (3) |
| PubH 138—Hospital Engineering Problems (ar) | |
| PubH 140—Vital Statistics I (3) | |

PubH 191—Science of Human Nutrition (3)	DInd 150—Dairy Bacteriology (3)
PubH 200—Research (ar)	Econ 103—Economic Development (3)
PubH 210—Seminar: Public Health (1)	Econ 104—International Economics (3)
PubH 212—Seminar: Public Health Engineering and Sanitation (ar)	Geog 133-134—Climatology (6)
PubH 230—Field Practice: Environmental Sanitation (ar)	Geog 167-168—American Cities—Location, Geographic Design (6)
PubH 231—Ground Water Development (ar)	Geog 256—Seminar: Metropolitan Regions of United States (3)
PubH 232—Field Practice: Ground Water Development (ar)	IE 153—Methods Engineering and Work Measurement (3)
PubH 241—Epidemiology of Noncommunicable Disease (3)	IE 180—Management for Engineers (3)
AgEn 149—Radioisotope Measurements (3)	IE 182—Industrial Safety (3)
Agro 256—Radiation Genetics (3)	InCh 112—Radioactivity and Nuclear Chemistry (3)
Arch 132—City Planning (3)	Math 164—Theory, Programming of Modern Digital Computers (3)
BPhy 170-171-172—Radiation Biophysics (9)	ME 146—Combustion (3)
CE 170—Water Supply (3)	ME 160—Psychrometrics Air Conditioning (3)
CE 171—Sewerage and Waste Water Treatment (3)	ME 162—Thermal Environmental Engineering (3)
CE 172—Sanitary Laboratory (3)	ME 169—Psychrometrics and Air Conditioning Laboratory (2)
CE 173-174—Sanitary Engineering Problems (6)	ME 183-184—Principles of Particle Technology (6)
CE 175—Industrial Waste Disposal (3)	ME 198—Industrial Instrumentation and Automatic Control (3)
CE 261-262—Water and Waste Water Plant Design (ar)	Phys 120-121-122—Experimental Atomic, Nuclear Physics (9)
ChEn 131-132—Chemical Reactor Analysis (6)	Phys 165-166-167—Physics of the Atmosphere and Meteorology (9)
ChEn 161-162-163—Nuclear Reactor Design (9)	
DInd 103—Market Milk (3)	
DInd 110—Sanitation Microbiology (3)	

Traineeships

A limited number of traineeships and fellowships are available for deserving student candidates in environmental health. These traineeships are generally for 1 year and are granted by the school through the Public Health Service Title I program and through Special Purpose Traineeship Grants to the school in the specialized areas of air pollution, radiological health, hospital engineering, and accident prevention.

Doctoral Degree Program

Requirements for Admission

Candidates for this degree with a major in environmental health 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 two modern foreign languages, or of one 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, Ruth von Bergen, Eleanor M. Anderson, Clare L. Blanchard, Delphie Fredlund, Marie J. McIntyre, Dorothy Downey, Marilyn R. Gladitsch, Justine J. Speer

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 (medical, surgical, maternal, pediatric, psychiatric, and public health nursing). Individual consideration will be given to applicants whose basic nursing preparation varies from the above. Deficiencies must be removed prior to full admission.
2. A satisfactory grade point average 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 two reference letters and, if possible, by an interview.
5. Experience: Applicants for the program leading to the master of public health degree should have experience in public health nursing (normally not less than 3 years). Those desiring to enter the program leading to the master of science degree may have less 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.

Plan of Instruction

Baccalaureate graduates who wish advanced preparation in public health nursing and who meet entrance requirements are admitted to programs leading to either the master of public health or master of science degree. The M.P.H. program allows for fewer free electives and, in general, is intended for nurses whose main interest is in administrative or senior supervisory positions. The M.S. programs, with public health as the area of concentration, offer wider opportunity for study in related fields and are designed to prepare public health nurses for a variety of leadership positions. Depending upon background and career goal, certain nurses preparing for administration and/or supervision may wish to elect the M.S. program although eligible for M.P.H. admission.

All graduate curriculums in public health nursing, whether leading to the M.P.H. or M.S. degree, include the following components: advanced theory and practice in public health nursing; courses in related fields; orientation to research; and functional preparation. In addition to advanced theory and practice in public health nursing, certain students may pursue extra study in areas such as mental health, long-term patient care and rehabilitation, or school nursing. See page 20.

Functional preparation is available in the areas of teaching, administration, and/or supervision. Individual students may, upon recommendation of the faculty, prepare for consultation. In all instances, clinical and functional courses are closely interrelated and are under the direct guidance of full-time University faculty. A student's program plan does not need to be set until the beginning of the winter quarter. It is possible to transfer from the master of public health to the master of science program with faculty approval at this time. See below for differentiation of curriculums according to type of degree.

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. A minimum of 4 consecutive quarters of study is required for public health nurses beginning in the fall quarter.

Recommended Courses

(Credits shown in parentheses; °° indicates required courses)

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|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| PubH 100A,B,C°°—Elements of Public Health (5) | PubH 174A,B°°—Administration and Supervision in Public Health Nursing (4) |
| PubH 102A°°—Environmental Sanitation (2) | PubH 175°°—Foundations of Public Health Nursing I (3) |
| PubH 104°°—Epidemiology I (3) | PubH 176°°—Foundations of Public Health Nursing II (3) |
| PubH 105—Epidemiology II (3) | PubH 177A,B°°—Clinical Seminar: Public Health Nursing (6) |
| PubH 106°°—Public Health Administration (3) | PubH 178—Seminar: Public Health Nursing Consultation (2) |
| PubH 107—Maternal and Child Health (3) | PubH 179—Rehabilitation Nursing and Long-Term Patient Care (ar) |
| PubH 122—Public Health Administration Problems (3) | PubH 210°°—Seminar: Public Health (1) |
| PubH 123—Topics in Public Health (ar) | PubH 214—School Health Programs (2) |
| PubH 125°°—Public Health Education (2) | PubH 241—Epidemiology of Noncommunicable Diseases (3) |
| PubH 139—Advanced Field Practice in Public Health Nursing: Mental Health (ar) | Anth 165°°—Culture, Personality (3) |
| PubH 140°°—Vital Statistics I (3) | SW 271—Community Organization (2) |
| PubH 141—Social and Economic Aspects of Medical Care (ar) | SW 275—Social Group Work (3) |
| PubH 171,172°°—Studies in Public Health Nursing (6) | Soc 120—Social Psychology (3) |
| PubH 173°°—Advanced Field Practice in Public Health Nursing: Functional Area (ar) (PubH 139 substituted for mental health students) | Soc 152—Sociology of Medicine and Medical Institutions (3) |

Master of Science—This is a plan B program in the Graduate School providing for concentration in public health and study in related fields. The following nurses should apply to the Graduate School for admission: those who wish to (1) teach public health nursing in a collegiate school of nursing, (2) prepare for beginning supervisory positions (certain experienced public health nurses who desire individualized program emphasis in administration and/or supervision also should apply via the Graduate School), (3) assume nursing leadership in community programs of long-term patient care and rehabilitation, (4) assume nursing leadership in the school nursing field.

All public health nursing students enrolled in a master of science program must complete the following courses in the area of concentration:

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|------------------------------------------------|----------------------------------------------------------------------------------|
| PubH 100A,B,C—Elements of Public Health (5) | PubH 140—Vital Statistics I (3) (or equivalent) |
| PubH 104—Epidemiology I (3) | PubH 171,172—Studies in Public Health Nursing (6) |
| (or) PubH 106—Public Health Administration (3) | PubH 173—Advanced Field Practice: Functional Area (ar) (PubH 139 substituted for |

mental health students, PubH 225 for teaching majors)	PubH 175—Foundations of Public Health Nursing I (3)	PubH 176—Foundations of Public Health Nursing II (3)	PubH 177A,B—Clinical Seminar in Public Health Nursing (6)	PubH 210—Seminar: Public Health (1)
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Not less than 18 additional credits must be taken in at least two related fields with a minimum of 6 credits required in each. See *Bulletin of the Graduate School*. Further detail concerning the related fields in line with various career plans is available from the School of Public Health.

Variations in Curriculums Within Public Health Nursing

Advanced Clinical Preparation

Mental Health (5 quarters)—Students may pursue either the master of science or master of public health sequence during the first 3 quarters on campus. The remaining 2 quarters are devoted to field experience with instruction from the co-ordinator of the mental health program. The purpose of the additional 2 quarters of study is to provide opportunity for the student to increase her competence in public health nursing, particularly in the use of behavioral and mental health concepts.

During the field period the student has the opportunity to work with patients in a public health nursing caseload, including psychiatric patients in and out of the hospital. The latter experience is accompanied by instruction from a psychiatrist. Throughout both experiences the student has opportunity to re-evaluate and add to her philosophy of public health nursing and to analyze her own performance.

Long-Term Patient Care and Rehabilitation (5 quarters)—This curriculum is designed to prepare selected nurses for positions as supervisors or consultants in community health agencies concerned with long-term patient care and rehabilitation.

The curriculum includes, in addition to clinical experience in public health nursing, opportunities for the student to have guided experience in a variety of community settings and to share learning experiences with other members of a multidisciplinary rehabilitation team.

School Nursing (4 quarters)—This is an experimental curriculum based upon the belief that a public health nurse can contribute best to the school health program through increased competence in her own field. In advanced public health nursing clinical experience, students have opportunity to work with selected children and families under faculty guidance over an extended period of time.

Courses in child development and in education provide additional background for nursing within the school setting. The curriculum also includes guided observation and exploration of the multidisciplinary nature of school and community services for children.

Functional Preparation

Teaching (5 quarters)—This curriculum is designed to utilize to a maximum the multidiscipline setting of a School of Public Health plus the educational advantages made possible through proximity to a collegiate School of Nursing. In addition, students have opportunity to share in courses in higher education and, with faculty guidance, to apply principles from public health, public health nursing, and education to the teaching of public health nursing.

Supervision and/or Administration (4 or 5 quarters)—Nurses who are preparing for junior or beginning positions in supervision pursue theory and practice courses

with emphasis on the guidance aspects of the supervisory relationship. Those with experience in supervision and/or administration have opportunity to secure additional preparation through analysis of the role, and through exploration of major theories of administration and of public health with appropriate practice under faculty guidance.

Traineeships

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.

Supplementary Preparation in Public Health Nursing for Nurses with a Previous Baccalaureate Degree

This program offers an opportunity for certain nurses to remove an undergraduate deficiency in public health nursing and thus prepare for employment in this field. Other nurses may utilize the program to qualify for admission for graduate study in nursing.

Graduates of collegiate programs in nursing which lack 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 or 2 quarters. A nurse with a baccalaureate degree whose nursing preparation was in a diploma school may be eligible for supplementary work under certain conditions.

All supplementary students make application to the School of Public Health via the Office of Admissions and Records. Admission will be in the fall quarter only, with the exception of students wishing to remove a deficiency in public health nursing prior to admission to a Master's program at the University of Minnesota.

Traineeships

Depending upon individual qualifications, and career goal, supplementary students are eligible for federal training assistance under Section 306, Public Health Service Act. 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.

Further information concerning the supplementary program and eligibility for traineeships is available from the School of Public Health.

4. Programs for Health Educators

Major Advisers: Ruth E. Grout, Norman A. Craig

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

The curriculum for health educators is designed to prepare persons who can assume leadership roles in planning and carrying out educational components of health programs.

The curriculum provides a basic public health content which will help the health educator to understand the broad field of public health and to work effectively with other health personnel. It also provides for study of educational principles, methods and techniques and the psychological and sociocultural factors governing their selection and use. The program of study consists of required courses supplemented by electives chosen on the basis of the individual student's interests and needs. Graduates of the programs described below are prepared to work on various aspects of health education of individuals, groups, and the general public.

One-Year Program—This program consists of a minimum of 3 quarters of academic study and 1 quarter of supervised field work in an approved agency. The program leading to a master of public health degree 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. A master of science program, with content similar to that for the master of public health, is offered through the Graduate School. Further information concerning the two programs is available from the School of Public Health.

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 3 quarters of academic study, followed by 2 quarters 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)

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|--------------------------------------------------------------------------|-------------------------------------------------------|
| PubH 95—Human Nutrition (3) | PubH 190**—Field Work in Public Health Education (ar) |
| PubH 100A,B,C**—Elements of Public Health (5) | PubH 210—Seminar: Public Health (1) |
| PubH 102A**—Environmental Sanitation (2) | PubH 227**—Problems in Public Health Education (ar) |
| PubH 104**—Epidemiology (3) | Anth 151—Applied Anthropology (3) |
| PubH 106**—Public Health Administration (3) | Anth 164—Social Anthropology (3) |
| PubH 107A—Maternal and Child Health Program (1) | Anth 165—Culture, Personality (3) |
| PubH 122—Public Health Administration Problems (3) | EdCI 105—Audio-Visual Materials in Education (3) |
| PubH 133—Mental Health (3) | EdCI 215—Problems in School Health Education (ar) |
| PubH 140**—Vital Statistics (3) | EdCI 217**—Seminar: School Health Education (3) |
| PubH 170**—Administration of Public Health Nursing (2) | EPsy 159—Personality Development, Mental Hygiene (3) |
| PubH 181,182,183**—Principles and Methods in Public Health Education (9) | |

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|-------------------------------------------------------------------|---------------------------------------------------|
| EPsy 193—Psychology of Human Learning (3) | Soc 140—Social Organization (3) |
| Jour 113—Mass Communication Theory (3) | Soc 153—Sociology of Leadership, Group Action (3) |
| Jour 115—Communications Analysis: Content, Audiences, Effects (3) | Soc 161—Rural Community Analysis (3) |
| Jour 130—Public Opinion, Propaganda (3) | SW 274—Seminar: Community Organization (ar) |
| Jour 150—Institutional Public Relations (2) | SW 275—Social Group Work (3) |
| Psy 140—Social Psychology (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 11 months of study. Students should plan to be in attendance for the second summer term preceding the regular academic year, and to remain in attendance during the interim between the end of second term Summer Session and the beginning of fall quarter.

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 102**—Environmental Sanitation (3) (114 may be substituted) | VBac 205—Advanced Veterinary Bacteriology (3) |
| PubH 103—Public Health Bacteriology (3) | VBac 221**—Advanced Veterinary Public Health (ar) |
| PubH 104,** 105—Epidemiology I and II (6) | VPaP 202—Seminar: Pathology (1) |
| PubH 106,** 122—Public Health Administration (6) | 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 154—Control of Radiation Hazards (3) | MicB 116**—Immunology (4) |
| PubH 155—Introduction to Air Pollution Problems (3) | MicB 124—Virology and Animal Cell Culture (3) |
| PubH 170A**—Administration of Public Health Nursing (1) | Ent 118—Experimental Ecology (3) |
| PubH 180**—Introduction to Biostatistics (6) (110 and 111, or 140 may be substituted) | FTec 101, 102—Food Technology (6) |
| PubH 210—Seminar: Public Health (1) | DInd 110—Sanitation Microbiology (3) |
| PubH 213—Seminar: Epidemiology (ar) | DInd 113—Technical Control of Dairy Products (3) |
| PubH 230—Field Practice in Environmental Sanitation (ar) | DInd 151—Advanced Dairy Bacteriology (3) |
| PubH 241—Epidemiology of Noncommunicable Diseases (3) | Pol 131—Public Administration (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 in Hospital Administration

Major Advisers: James A. Hamilton, James W. Stephan

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, Minnesota 55455.

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 132—Mental Health Program (1)
- PubH 141—Social and Economic Aspects of Medical Care (ar)
- 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—Administration of Public Health Nursing (1)
- PubH 210—Seminar: 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 ordinarily 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 a 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 teaching or research careers in hospital administration. The field of hospital administration is conceived to be more than the internal management of a hospital. Rather it is understood to encompass broadly all elements that affect the hospital and its related health services as social institutions. The curriculum emphasizes breadth of learning in contrast to technical development. The student will be given opportunity (1) to understand human society and the dynamic relationships between social behavior and health; (2) to comprehend the economic, political, psychological, and social aspects of health services; (3) to extend his knowledge of the planning, organization, and development of health services; (4) to acquire knowledge of research and skill in its application to the hospital and other health services; and (5) to obtain experience and guidance in teaching hospital administration.

Each student's program of study will be arranged individually with the guidance of his advisers and in accordance with Graduate School requirements. Each program will cover subject matter of the major field in the following three areas: (1) organization and administration of hospitals and related health services; (2) social, psychological, economic and political aspects of health care services; and (3) methodology of hospital and related health services research. In addition, the student will achieve competency in social science fields particularly related to the major field. Especially recommended are economics, political science, psychology, and sociology. With the approval of his advisers, the student will complete one of the following requirements: (1) at least 24 credits in a coherent program of courses selected from the related social science fields; (2) all of the minor field requirements in one of the related social science fields or in two fields as a split minor in social science; or (3) a second major in one of the related social science fields.

All candidates will also complete a minimum of 9 credits in courses in statistics numbered 100 or higher with the approval of his advisers. A reading knowledge of one foreign language is required and a research technique. A dissertation dealing with a significant problem concerning health care services as they relate to the role and function of the hospital is also required. Students lacking the basic public health courses will be required to complete such courses concurrently with their doctoral program. Graduate work satisfactorily completed prior to entering the doctoral program may be applied where appropriate and in accordance with the regulations of the Graduate School.

8. Programs in Physiological Hygiene

Major Adviser: Ansel 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 in 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.

Recommended Courses

(Credits shown in parentheses)

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

9. Program for Vital Statisticians

Major Advisers: Jacob E. Bearman, Richard B. McHugh, 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 125**—Public Health Education (2)
PubH 102A**—Environmental Sanitation (2)	PubH 140,** 150—Vital Statistics (6)
PubH 104,** 105—Epidemiology I and II (6)	PubH 141—Social and Economic Aspects of Medical Care (ar)
PubH 106**—Public Health Administration (3)	PubH 168—Orientation to Medical Sciences (3)
PubH 110, 111—Biostatistics I and Biostatistics Laboratory (5)	PubH 170A**—Administration of Public Health Nursing (1)
PubH 120-121, 130-131—Biostatistics II and III (with Laboratory) (10)	PubH 210—Seminar: Public Health (1)

Jour 150—Public Relations in Community Services (2)
 Math 121-122-123—Mathematical Theory of Statistics (9)

Pol 131—Public Administration (3)
 Psy 299—Tabulating Equipment Laboratory (1)
 Soc 111—Population Trends (3)
 Soc 112—World Population Problems (3)

10. Program for Public Health Nutritionists

Major Advisers: Ruth Stief, Joseph Anderson

Requirements for Admission

1. Bachelor's degree from an approved institution.
2. Appropriate courses in biochemistry, microbiology, nutrition, dietetics, education, psychology, behavioral sciences, foods, and food service management. Candidates who have not had undergraduate course work considered to be essential will be required to make up the deficiencies.

Plan of Instruction

The course of study leading to the degree of master of public health or master of science covers a minimum of 1 calendar year beginning with the second term Summer Session preceding the regular academic year. Students should plan to remain in residence during the interim between the end of second term Summer Session and the beginning of fall term. The first term Summer Session following the regular academic year will be devoted to field work in an approved training center. Students desiring the master of science degree should consult the public health listing in the *Bulletin of the Graduate School*.

The program of study includes certain required courses supplemented by electives chosen in accordance with the student's special interests and needs. The course credits are distributed approximately one-third in public health areas other than nutrition, one-third in nutrition and one-third in related courses covering the areas of social welfare, community organization, the behavioral sciences, and education.

Recommended Courses

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

PubH 100A,B,C**—Elements of Public Health (5)
 PubH 102A**—Environmental Sanitation (2)
 PubH 104**—Epidemiology (3)
 PubH 106**—Public Health Administration (3)
 PubH 122—Public Health Administration Problems (3)
 PubH 123—Topics in Public Health (ar)
 PubH 125**—Public Health Education (2)
 PubH 140**—Vital Statistics I (3)
 PubH 170**—Administration of Public Health Nursing (2)
 PubH 189—Field Work in Public Health Nutrition (ar)
 PubH 191—Science of Human Nutrition (3)
 PubH 193—Community Nutrition Programs (ar)
 PubH 194—Seminar: Public Health Nutrition (ar)
 PubH 196A,B,C—Public Health Nutrition (ar)
 PubH 210—Seminar: Public Health (1)

HE 171—Maternal and Child Nutrition (3)
 HE 175—Nutrition (4)
 HE 176—Advanced Nutrition (3)
 HE 183—The Family in World Perspective (3)
 HE 270—Principles of Human Nutrition (3)
 HE 271—Principles of Human Nutrition (3)
 HE 279—Seminar: Nutrition (1)
 Anth 151—Applied Anthropology (3)
 Anth 165—Culture and Personality (3)
 Soc 141—The Family (3)
 Soc 145—Urban Sociology (3)
 Soc 233-234-235—Seminar: Methods for the Evaluation of Social Action Programs (2 per qtr)
 SW 295—General Seminar: Social Work Methods (ar)
 EdCI 104—Adult Education (3)
 EdCI 217—Seminar: School Health Education Program (3)
 EPsy 193—Psychology of Human Learning (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	Credit(s)	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 a prerequisite course 6 in the same department as the course being described.

Public Health (PubH)

- 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
- 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
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) Fredlund
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 nurses) Gladitsch
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) 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)
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 cr 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 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 #) Bond, Olson

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

- 102A. Environmental Sanitation.** General principles of urban and rural sanitation; problems encountered by official health agencies. (2 cr; prereq 100A or ¶100A and #) Bond, 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 non-infectious 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, Gullen
- 105. Epidemiology II.** Extension of epidemiologic principles to detailed study of selected diseases. (3 cr; prereq 104) Schuman, Gullen
- 106. Public Health Administration.** Structure, basic functions, and activities of public health agencies. (3 cr; prereq 100A) G Anderson, Hamilton, Amyot
- 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) Bridge
- 107A. Maternal and Child Health Program.** Community programs for major maternal and child health problems. (1 cr, §107; prereq hospital administrators and #) Bridge
- 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) 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 , χ^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) Bond, Buxell
- 112B. Waste Disposal Systems. (1 cr, §114) Bond, Buxell
- 112C. Swimming Pools and Plumbing. (1 cr, §114) Bond, Buxell
- 113. Public Health Engineering: Field Investigations.** (Prereq engineering degree and 102 and #)
- 113A. Water Supplies. (2 cr, §114) Bond, Buxell
- 113B. Waste Disposal. (2 cr, §114) Bond, Buxell
- 113C. Swimming Pools and Plumbing. (2 cr, §114) Bond, Buxell
- 114. Environmental Sanitation Programs.** Public health supervision of activities in urban and rural sanitation. (3 cr, §112, §113, or §116; prereq #) Bond
- 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
- 115A. Institutional Food Protection Programs.** Public health implications in the design, construction, and installation of food service equipment; sanitary controls in food preparation and service; regulatory controls by official public health agencies. (2 cr; prereq #) Bond, Stauffer

116. **Public Health Engineering Administration.** Administrative organization of environmental sanitation activities. (2 cr, §114; prereq #) Bond
- 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, Craig
- 125A. **Public Health Education.** Purposes; scope; methods and materials; planning, with special emphasis on hospitals. (1 cr; prereq hospital administrators or #) Grout, Craig
126. **Occupational Health Programs.** Professional, social, economic, and legal aspects; organization; technical aspects of specific health hazards. (3 cr; prereq 100A or ¶100A and #)
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 #) 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
138. **Hospital Engineering Problems.** The application of environmental engineering, sanitation and maintenance principles and techniques, with particular reference to effective planning, administration and operation of hospitals. (Cr ar; prereq #) Staff and visiting lecturers
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. (Cr ar; prereq #) Ar

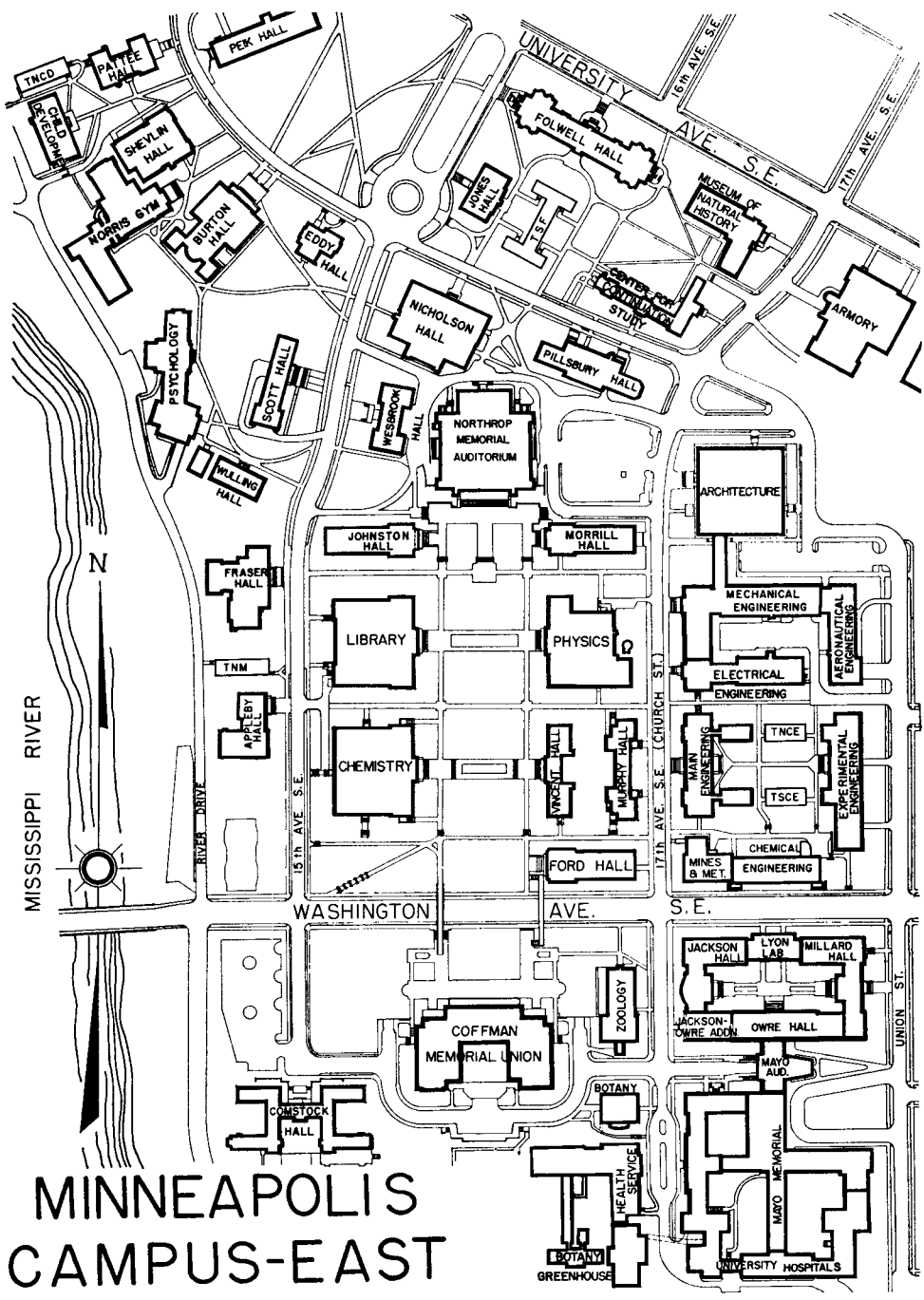
142. **Medical Economics.** Economic problems of medical and hospital care for community; programs for medical care and health and hospital insurance. (2 cr; prereq sr medical students only) Ar
143. **Introductory Topics in Mathematical Biology.** Introductory study of physico-, chemico-mathematical biology (analytical methods) of mechanical and electrochemical problems of colloids, cells, and tissues, and of the kinetics of simple reactions and transports. (3 cr; prereq 1-year sequences in mathematics (including calculus), physics, chemistry, and a basic biological science, with lab work in at least one of them or #) Evans
144. **History of Biostatistics.** Development of probability theory and systems for collection of vital statistics; early applications to life tables, medical, and biological problems; biographies of men important in development. (2 cr; prereq 3 cr in statistics) Thornton
145. **Low Level Radioactivity and Radiation Measurements.** Advanced isotope technics designed for assay of low levels of radioactivity in environmental samples. Includes use of gamma spectrometry, liquid scintillation spectrometry and low background anticoincidence beta counters. (3 cr; prereq #) Foreman
146. **Radiological Health II.** Biological effects of radiation covering radiation biochemistry, acute radiation syndrome, chronic effects, cellular and hematological aspects and mutagenic properties of radiation. (3 cr; prereq #) Foreman
147. **Environmental Radioactivity.** Measurement, evaluation, and control of environmental radioactivity with special emphasis on radiation to the general population. Includes natural radioactivity, fallout, reactor environs, radioactive wastes, and radiation ecology. (3 cr; prereq #) Foreman
149. **Public Health Aspects of Housing and the Residential Environment.** The principles of healthful housing and their application in community planning and development. (3 cr; prereq #) Buxell
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
151. **Health Aspects of Air Control in Hospitals.** Basic considerations in control of natural and mechanical air flow in hospitals to avoid spread of infection, to control odors, and to promote patient care. (2 cr; prereq #) Michaelsen
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
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
157. **Radiation Protection Criteria for Hospital Design and Operation.** Radiation protection methods in the design, shielding, equipping and operation of a radioisotope laboratory, X-ray, and other ionizing radiation facilities. (2 cr; prereq #) Michaelsen, Wollan
158. **Hospital Safety.** Theories and practices in accident and fire prevention and control for hospitals and other medical care facilities. (3 cr; prereq #) Michaelsen, Scheffler
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, Sweetland

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, Laur
- 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, Bieter, Damberg, Kincaid, Sweetland, Dumas, Laur
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, Michaels, Bieter, Laur
166. **Hospital Clerkship.** Assignment to local hospital for survey and solution of special problem. (5 cr) Stephan, Bieter, Dumas
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, Stephan, Laur
170. **Administration of 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
- 170A. **Administration of Public Health Nursing.** Scope of public health nursing; relationship to other aspects of public health. (1 cr, §170; prereq #) Murphy
- 171-172. **Studies in Public Health Nursing.** Orientation to research methodology; design and completion of a project. (3 cr per qtr; prereq 140, 175 or #) Murphy
173. **Advanced Field Practice in Public Health Nursing: Functional Area.** Opportunity for field placement in suitable functional area including administration, supervision, or consultation, under guidance of faculty members. (Cr ar; prereq public health nurses only) Murphy, E Anderson, Blanchard, Fredlund, McIntyre
- 174A-B. **Administration and Supervision in Public Health Nursing.** Application of principles; analysis of selected aspects of administrative and supervisory process in public health nursing. (2 cr per qtr; prereq public health nurses only, #) Murphy, Blanchard
175. **Foundations of Public Health Nursing I.** Investigation of the role of public health nursing within nursing and public health; review of content and process inherent in dynamic public health nursing; current trends in education and practice. (3 cr) von Bergen and associates
176. **Foundations of Public Health Nursing II.** Dynamics of human behavior; analysis of public health nursing practice through use of case material. (3 cr; prereq 175) von Bergen and Williams
- 177A-B. **Clinical Seminar: Public Health Nursing.** Experience with selected patients and families; concurrent seminar. (3 cr per qtr; prereq 176) von Bergen and associates
178. **Seminar: Public Health Nursing Consultation.** Opportunity for selected students to deepen understanding of the process involved in consultation. (2 cr; prereq #)
179. **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
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; community organization; communication theory; methods and materials; program planning and evaluation. (3 cr per qtr; prereq #) Grout, Craig
185. **Air Analysis.** Laboratory and field exercises on problems involving industrial hygiene and air pollution. The exercises include air flow measurement, calibration of instruments, analysis of different gases, stack sampling, dust counting and sizing, and industrial plant visits. (3 cr; prereq 152 or 155, #) Paulus
189. **Field Work in Public Health Nutrition.** Placement in an approved agency with opportunity for experience in various facets of public health nutrition activities. (Cr ar; prereq 196A,B,C) Stief and associates
190. **Field Work in Public Health Education.** Three months of supervised field experience. (Cr ar; prereq 183, 227) Grout, Craig, 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 106, 107 or equiv and #) Taylor
193. **Community Nutrition Programs.** Study of and participation in selected community nutrition programs under guidance of faculty. (Cr ar; prereq #, 194) Stief
194. **Seminar: Public Health Nutrition.** (Cr ar; prereq #) Stief
195. **Public Health Aspects of Cardiovascular Disease.** Etiology, incidence; problems of control and relationship to mode of life. (3 cr; prereq #) Keys, Grande
- 196A-B-C. **Public Health Nutrition.** Current local, state, national, and international public health nutrition problems; organization, administration, evaluation of community nutrition programs; educational methods and techniques applied to community nutrition activities. (Cr ar; prereq #) Stief
- 197-198†-199‡. **Elements of Mathematical Biology.** Physico-, chemico-, mathematical biology; analytical methods; mechanical (static and dynamic) and electrochemical problems of colloids, cells, and tissues; kinetics of reactions, transport, and their combinations; computers in bio-medicine, analog and digital. (5 cr per qtr; prereq mathematics, including differential equations and 1-year sequences in physics, chemistry, and a basic biological science, with lab work in at least one of them or #) Evans
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
- 201A. **Topics in Biometry.** Advanced topics in vital statistics. (3 cr; prereq 140 with grade B) Thornton, Bearman
202. **Seminar: 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: Public Health.** (Cr ar) Staff
211. **Seminar: Biometry.** (Cr ar) Staff

212. **Seminar: Public Health Engineering and Sanitation.** (Cr ar; prereq #) Bond
213. **Seminar: Epidemiology.** Discussion of selected current epidemiologic problems. (Cr ar) Schuman, Gullen
214. **School Health Programs.** Review of major health problems among children of school age; methods of providing and evaluating school health services. (Cr ar; prereq 107 or #) Bridge
215. **Maternal and Child Health.** Administration of well-child and antepartum conferences; psychosomatic problems of children. (Cr ar; prereq physicians only, #) Bridge
- 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
221. **Seminar: Nursing in Long-Term Patient Care and Rehabilitation.** Exploration of multidisciplinary aspects; role relationships affecting nursing; review of current research findings. (Cr ar; prereq 179) E Anderson and associates
222. **Seminar: School Nursing and Related Field Practice.** Exploration of nursing in the school setting; role relationships; review of current research. (Cr ar; prereq 107 or ¶214) Murphy and Fredlund
223. **Orientation to Teaching Public Health Nursing.** Evolution of public health nursing within collegiate nursing education; rationale for the relationship; impact of various related developments. (3 cr; prereq #) Murphy, McIntyre
224. **Seminar: Public Health Nursing Within the Curriculum.** Course objectives; organization; opportunity to explore problems in the development of plans for teaching public health nursing. (Cr ar; prereq #) Murphy, McIntyre
225. **Practicum in Teaching Public Health Nursing.** Planning for and evaluation of instruction; selected field experiences and seminars. (Cr ar; prereq #) Murphy, McIntyre
227. **Problems in Public Health Education.** Independent study and experimentation in health education. (Cr ar; prereq #) Grout, Craig
230. **Field Practice in Environmental Sanitation.** (Cr ar; prereq #) Bond and others
231. **Ground Water Supplies.** Ground water as a source of supply for communities in economically underdeveloped areas of the world. Special reference to public health problems involved. (Cr ar; prereq grad engineer and #) Bond, staff, visiting lecturers
232. **Field Work in Ground Water Development.** Development of ground water sources for communities in economically underdeveloped areas of the world. Special reference to public health problems involved. (Cr ar; prereq grad engineer, 231) Bond, staff, visiting lecturers
241. **Epidemiology of Noncommunicable Diseases.** Application of basic epidemiologic principles to noncommunicable diseases and to trauma; selected disease examples. (3 cr; prereq 104) Schuman, Gullen
- 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, Jaco, Litman, and staff
264. **Seminar: Medical Care Patterns Abroad.** (3 cr; prereq #) Litman
265. **Seminar: Research Studies on Health Services.** (3 cr; prereq #) Jaco, Litman, Weckwerth, and staff
266. **Hospital Administration Topics.** Independent study under tutorial guidance on selected problems, current issues. (Cr ar; prereq #) Hamilton, Stephan

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267. **Health and Human Behavior.** The social ecology of health; social and personal components of illness; health and the community; social and cultural aspects of health care services. (3 cr; prereq #) Jaco
269. **Political Aspects of Health Services.** Analysis of interrelationships between government, politics, and health services; the political and social bases of health legislation and community decision-making in the provision and modifications of health services. (3 cr; prereq #) Litman
273. **Contemporary Problems of Hospital and Related Health Services.** Current concepts, problems, principles, and future developments in hospital and related health services. (Cr ar; prereq #) Hamilton, Stephan, Jaco and staff
274. **Readings in Theory and Principles of Hospital Administration.** (Cr ar; prereq #) Hamilton, Stephan, and staff
290. **Research in Physiological Hygiene and Related Areas.** (Cr ar) Staff



MINNEAPOLIS CAMPUS-EAST



XVII-11

1964-1966

SCHOOL OF DENTISTRY

Dentistry • Dental Hygiene • Dental Assisting

UNIVERSITY OF MINNESOTA BULLETIN

UNIVERSITY OF MINNESOTA

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SCHOOL OF DENTISTRY

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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. The lecture rooms, laboratories, and clinics in Owre Hall are well arranged and are furnished with the modern equipment that is essential for the teaching of the science and practice of dentistry.

The dental school is part of a great university health center. It is adjacent to the main University of Minnesota Hospitals, and the teaching and research laboratories of the basic medical sciences. This center provides the students with excellent facilities for the study of dentistry and allied dental fields.

These facilities and the highly specialized teaching staff in the dental school, the University Hospitals, the basic medical science subjects, and other academic disciplines enable the students to study dentistry and allied fields under very favorable conditions. Instruction is given by lectures, laboratory courses, closed circuit television, demonstrations, and clinical practice in the dental clinics.

The students enjoy all the advantages which come from participation in the activities of a university composed of academic, scientific, and professional colleges. Since the dental school is on the main campus of the University, cultural and recreational opportunities are available for the students. The central library and the biomedical library are conveniently located near Owre Hall. Dormitories for men and women are just a short distance from the dental school.

The School of Dentistry conducts a broad program of education, research, and service. It offers a 4-year program in dentistry leading to the degree of doctor of dental surgery (D.D.S.). Also, the school promotes a strong graduate activity at the M.S.D. and Ph.D. levels and sponsors auxiliary personnel programs in dental hygiene and dental assisting. The school maintains facilities for an active dental research effort and provides service to the public and the profession of dentistry through a variety of activities.

Four-Year Program Leading to Degree of Doctor of Dental Surgery

Requirements for Admission

General—The 4-year program in dentistry for the D.D.S. degree is open to both men and women. A freshman class 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.

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. General biology or general zoology—10 quarter credits.
3. Physics—12 quarter credits.
4. General principles of 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 preidental 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 1A-2A-3A (12 qtr cr) or 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. GeCh 4-5, 6 (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 53, 66; Art 20; and Clas 48.

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 general 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 Morrill Hall, University of Minnesota, Minneapolis, Minnesota 55455.

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 Morrill Hall, University of Minnesota, Minneapolis, Minnesota 55455. 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. After the request for transfer of college has been submitted, the Office of Admissions and Records will provide the School of Dentistry with the student's University of Minnesota transcripts as needed by the School.

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 Morrill Hall.
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 Morrill Hall.

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 Liberal 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 the Arts College Upper Division and a minimum of 30 must be in Upper Division courses.

The Arts College credits must include a minor and 15 Upper Division credits outside the major and minor areas. Since the major area is dentistry, the 15 Upper Division elective credits must be in the humanities and social sciences. 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 Liberal 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 Liberal 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 Scholastic Committee. 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 pre-dental 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 the School of Dentistry 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	\$155.00
Nonresidents	330.00
Credit hour tuition fee (unclassified students, auditors, and others carrying less than full work):	
Residents of Minnesota	13.00
Nonresidents	27.50
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	\$611.00	\$139.00	\$ 8.00
Sophomore Year	831.00	133.00	\$75.00	12.00
Junior Year	251.00	108.00	3.00
Senior Year	49.00	42.00

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 Wesbrook 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

Medical care and health counseling are provided for all students through the University Health Service. No charge is made to students for general care or for consultations with a specialist on physical or mental health problems except for prolonged treatment of an elective nature for certain conditions. Medical care is given to a hospitalized student without charge, except for surgery. Students also receive specialized services, such as allergy testing and treatment, eye examinations, and laboratory services. Physical therapy and X-ray therapy are provided up to a limit of \$50 per quarter. Charges are made on a cost basis or less for drugs, glasses, and dentistry.

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 the Reading Room on the third floor of the Owre-Jackson addition.

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. 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, Minnesota 55455.

FOUR-YEAR PROGRAM IN DENTISTRY

	Fall Qtr		Winter Qtr		Spring Qtr		Total	
	Cr	Hrs	Cr	Hrs	Cr	Hrs	Cr	Hrs
Freshman Year								
Dent 50-51-52—Dental Anatomy	3	50	3	70	3	70	9	190
Dent 55—Development of Occlusion	2	20					2	20
Dent 60-61-62—Dental Prosthetics	4	100	4	100	3	70	11	270
Anat 108-109—Gross Human Anatomy for Dental Students			6	120	6	120	12	240
MicB 100—Microbiology for Dental Students					6	120	6	120
Met 159—Dental Physical Metallurgy			2	20			2	20
MicB 104-105—Physiological Chemistry	7	110	5	50			12	160
PubH 76—Introduction to Public Health for Dental Students					1	10	1	10
	16	280	20	360	19	390	55	1030
Sophomore Year								
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 83—Genetics: An Introduction for Den- tal Students	1	10					1	10
Dent 84-85-86—Operative Technic	3	75	4	100	3	75	10	250
Dent 91—Orthodontic Technic					1	10	1	10
Anat 105—Microscopic Anatomy	8	140					8	140
Path 100—Pathology for Dental Students					8	130	8	130
Phcl 101—Introduction to Pharmacology					1	10	1	10
Phsl 101—Human Physiology			10	120			10	120
	19	395	20	360	18	335	57	1090
Junior Year								
Dent 90—Anesthesia	1	10					1	10
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 130—Oral Diagnosis					2	20	2	20
Dent 132C—Roentgenology Clerkship					1	36	1	36
Dent 141-142—Operative Dentistry			1	10	2	20	3	30
Dent 140C-141C-142C—Operative Clinic	3	90	4	120	3	90	10	300
Dent 144—Endodontics	1	10					1	10
Dent 150—Introduction to Oral Surgery					1	10	1	10
Dent 161-162—Oral Pathology and Histology			3	40	3	40	6	80
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 102—General Pharmacology	6	80					6	80
Phcl 108—Dental Therapeutics			1	10			1	10
	19	370	17	360	20	416	56	1146
Senior Year								
Dent 105—Orthodontics	3	30					3	30
Dent 115C-116C-117C—Dental Prosthetics Clinic	2	60	2	60	2	60	6	180
Dent 127-128-129—Seminar: Restorative Dentistry	1	10	1	10	1	10	3	30
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 138—Diagnostic Oral Roentgenology			1	10			1	10
Dent 145C-146C-147C—Clinical Operative Dentistry	2	60	3	90	2	60	7	210
Dent 149—The Management of Mass Cas- ualties 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	21	430	15	350	52	1080

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 Associate Professor

Lee C. Hermann, D.D.S.

Clinical Assistant Professor

Robert R. Hoover, D.D.S.
Melvin C. Humbert, D.D.S.
Rad M. Jevric, D.D.S.
George D. MacGibbon, D.D.S.
Charles B. McAllister, D.D.S.
Eugene A. Moll, D.D.S.

Professorial Lecturer

Herman A. Garmers, D.D.S.

Clinical Instructor

Jacob R. Bergstedt, D.D.S.
George A. LeMay, 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 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 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
- 127. Seminar: Restorative Dentistry.** 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) Yock, Jensen, Morstad

Division of Dental Anatomy

Professor

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

Associate Professor

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

Clinical Assistant Professor

Irving A. Borkon, D.D.S.
Cory H. Kruckenberg, D.D.S.

Clinical Instructor

Charles H. Buscher, D.D.S.
Peter M. Holm, 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; de-

tailed 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. (3 cr per qtr; 190 lab and lect hrs) Hall and staff

Division of Prosthetics

Professor

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

Associate Professor

Maurice W. Meyer, D.D.S., Ph.D.
E. Severn Olsen, D.D.S., M.S.D.

Clinical Associate Professor

Edward E. Anderson, D.D.S., M.S.
Robert J. Jacobsen, D.D.S.
Clarence N. Reiersen, D.D.S.

Clinical Assistant Professor

Rudolph B. Delton, D.D.S.
John F. Erickson, D.D.S.
Imants R. Niels, D.D.S.

Clinical Instructor

Leonard H. Arndt, D.D.S.
Robert W. Farish, D.D.S.
George J. Hayano, D.D.S.
Vernon R. Steffens, D.D.S.
David W. Twomey, 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.** Introductory clinical course in removable denture prosthesis. The course includes (1) demonstrations in impression-making and (2) practice in impression-making with various materials and making models from them. (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. Television demonstrations and personal supervision are closely correlated during these courses. (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. Practical examinations are given encompassing clinical practices taught in the course. (2 cr per qtr; 180 clin and lab hrs) Staff
- 128. Seminar: Restorative Dentistry.** 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) Morstad, Jensen, Yock

Division of Operative Dentistry

Professor

James R. Jensen, D.D.S., M.S.D., *chairman*
John W. Wakely, D.D.S., M.S.

Clinical Professor

Blanchard K. Braum, D.D.S.

Associate Professor

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

Clinical Associate Professor

Herman T. Aeziman, D.D.S.
William F. Braasch, D.D.S.
Herbert A. Carlson, D.D.S.
Peter S. Gregus, D.D.S.
Miles B. Hirschev, D.D.S.

Clinical Assistant Professor

Kenneth J. Buechele, D.D.S.
David R. Bernard, D.D.S.

Kenji Horita, D.D.S.
Carl J. Olson, D.D.S., M.S.D.
Arthur R. Schmidt, D.D.S.
Hugo M. Wolf, D.D.S.

Clinical Instructor

Robert W. Bjorndahl, D.D.S.
Clark F. LaChapelle, D.D.S.
Henry J. Menke, D.D.S.
David McGill, D.D.S.
Arne R. Westerback, D.D.S.
Edgar F. Ziegler, D.D.S.

- 84-85-86. Operative Technic.** Introduction to the nomenclature of operative dentistry, principles of cavity preparation, manipulation of restorative materials and related instrumentation. (3-4-3 cr; 250 hrs) Wakely and staff
- 141. 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
- 129. Seminar: Restorative Dentistry.** 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) Jensen, Morstad, Yock
- 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

George M. Yamane, D.D.S., Ph.D.

Assistant Professor

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

Clinical Associate Professor

William Branstad, D.D.S.

Clinical Assistant Professor

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

Clinical Instructor

John S. Bacon, D.D.S.

- 80. Oral Diagnosis.** Oral examinations, methods of investigation, and recording of clinical data. (1 cr; 10 lect hrs) Yamane

- 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
- 130. Oral Diagnosis.** Series of lectures on the clinical appearance of oral lesions, its natural history and treatment of these lesions. (2 cr; 20 hrs) Yamane and staff
- 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) Yamane, 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, Yamane
- 137C. Oral Diagnosis Clinic.** Students serve clerkships in the Division of Oral Diagnosis. (1 cr; 30 clin hrs) Yamane
- 138. Diagnostic Oral Roentgenology.** Lectures on interpretations of intraoral and extraoral roentgenograms and radiobiology. (1 cr; 10 hrs) Yamane and Petersen

Division of Oral Histology and Pathology

Professor

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

Associate Professor

Robert A. Vickers, D.D.S., M.S.D.

Clinical Assistant Professor

Robert S. Redman, D.D.S., M.S.D.

Clinical Instructor

Lawrence H. Meskin, D.D.S., M.S.D.
Burton L. Shapiro, D.D.S., M.S.D.

- 161-162. 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 is emphasized. Microscope required; use of microscope may be obtained by purchasing \$3 microscope card from bursar. (4-2 cr; 40 lect hrs) Gorlin and staff

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 Associate Professor

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

Clinical Assistant Professor

Roger J. Burke, D.D.S., M.S.D.
William P. Frantzich, 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, five 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., *acting chairman*

Associate Professor

Robert J. Isaacson, D.D.S., M.S.D., Ph.D.

Clinical Associate Professor

Walter M. Jacobsen, D.D.S., M.S.
Charles D. Simpson, D.D.S., M.S.D.

Clinical Assistant Professor

Theodore T. Edblom, D.D.S., M.S.D.
Paul W. Jorgenson, D.D.S., M.S.D.
Charles D. Ostergren, D.D.S., M.S.D.
Richard C. Paulson, D.D.S., M.S.D.

55. **Development of Occlusion.** Factors affecting the normal and abnormal development of the deciduous, mixed, and permanent dentitions. (2 cr; 20 hrs) Isaacson
- 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
91. **Orthodontic Technic.** Lectures and demonstrations concerning those auxiliary orthodontic appliances most useful to the practicing dentist; and their actual construction on models. (1 cr; 30 hrs) Jacobsen and staff
105. **Orthodontics.** Principles and procedures in preventive and interceptive and corrective orthodontics. Analysis of cases and treatment planning. (3 cr; 30 lect hrs) Steadman, Edblom, Ostergren

Division of Pedodontics

Professor

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

Clinical Associate Professor

Russell H. Solsvig, D.D.S.

Clinical Assistant Professor

Dennis J. Brandstetter, D.D.S.
Kenneth C. Erickson, D.D.S.

Walter G. Iverson, D.D.S.

William M. Trygstad, D.D.S.
Marion R. White, D.D.S.

Clinical Instructor

Laurence A. Garfin, D.D.S.
Warren W. Hunt, D.D.S.
Bruce M. Nelson, D.D.S.
Martin J. Rathmanner, D.D.S.

170. **Pedodontics.** Value and aims of pedodontics, management of child patient, diagnosis, treatment planning, prophylaxis, premedication, use of stainless steel crowns, and local anesthesia. (1 cr; 10 lect hrs) Wittich
171. **Pedodontics.** Treatment of pulps of deciduous and young permanent teeth, restoration of fractured permanent anterior teeth, space maintainers, topical application of fluorides, construction of partial and full dentures for children. (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, and application of preventive malocclusion methods. (1 cr; 10 clin hrs) Wittich and staff

Division of Periodontics

Associate Professor

Richard E. Stallard, D.D.S., M.S.D., Ph.D.,
chairman

Clinical Assistant Professor

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

Professor

Erwin M. Schaffer, D.D.S., M.S.D.

Clinical Instructor

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

Clinical Associate Professor

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

Professorial Lecturer

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

Clinical Instructor

Burton L. Shapiro, D.D.S., M.S.D.

- 83. Genetics: An Introduction for Dental Students.** Lectures on chemical basis of heredity, cytogenetics, genetic ratios, methodology of human genetics, heredity and environment, and mutation and radiation. Genetic principles related to specific problems in dentistry. (1 cr; 10 hrs) Shapiro
- 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) Staff

CONTRIBUTING DEPARTMENTS

Anatomy

Professor

Arnold Lazarow, M.D., Ph.D., *chairman*
R. Dorothy Sundberg, Ph.D., M.D.
Lemen J. Wells, Ph.D.

Lecturer

Robert J. Isaacson, D.D.S., M.S.D., Ph.D.

Assistant Professor

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

Associate Professor

Anna Mary Carpenter, Ph.D., M.D.
William J. L. Felts, 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. Gross Human Anatomy for Dental Students.** Lectures and dissection of extremities and abdomen and pelvis. (6 cr; 120 hrs) Felts and staff
- 109. Gross Human Anatomy for Dental Students.** Lectures and dissection of thorax and head and neck. (6 cr; 120 hrs) Felts and staff

Microbiology

Professor

John Spizizen, Ph.D., *chairman*
Edwin L. Schmidt, Ph.D.
Dennis W. Watson, Ph.D.

Assistant Professor

Dwight L. Anderson, Ph.D.
Robert W. Bernlohr, Ph.D.
Brooks D. Church, Ph.D.
Ronald W. Hinz, Ph.D.
Joseph W. St. Geme, M.D.
John E. Verna, Ph.D.

Associate Professor

K. Gerhard Brand, M.D.
Martin Dworkin, Ph.D.
Leroy C. McLaren, Ph.D.
Louis H. Muschel, Ph.D.
Palmer Rogers, Ph.D.

Instructor

Terrence M. Joys, Ph.D.
Mary E. Pollock, Ph.D.
James T. Prince, M.S.

- 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) Anderson and staff

Pathology

Professor

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

Instructor

William A. Foley, M.D.
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 two \$3 microscope cards from bursar) Dawson and assistants

Pharmacology

Professor

Frederick E. Shideman, M.D., Ph.D., *chairman*
 Raymond N. Bieter, M.D., Ph.D.
 Norman O. Holte, D.D.S., M.S.D.
 Gilbert J. Mannering, Ph.D.
 Harold N. C. Wright, Ph.D.

Associate Professor

Jack W. Miller, Ph.D.

Assistant Professor

Elizabeth M. Cranston, Ph.D.
 Akira E. Takemori, Ph.D.
 Travis I. Thompson, Ph.D.
 Ben G. Zimmerman, Ph.D.

- 101. Introduction to Pharmacology.** (1 cr; 10 hrs) Cranston and staff
102. General Pharmacology. Detailed lecture and laboratory study of important drugs. (6 cr; 100 hrs) Cranston and staff
108. Dental Therapeutics. (1 cr; 10 hrs) Holte and staff

Physical Metallurgy

Professor

Richard A. Swalin, 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

Biochemistry

Professor

Wallace D. Armstrong, Ph.D., M.D., *chairman*
 Cyrus P. Barnum, Jr., Ph.D.
 Leon Singer, Ph.D.
 Ivan D. Frantz, M.D.
 Ellis S. Benson, M.D.

John F. Van Pilsum, Ph.D.
 Richard W. Von Korff, Ph.D.
 Donald B. Wetlaufer, Ph.D.

Assistant Professor

Curtis H. Carlson, Ph.D., M.D.
 George J. Schroepfer, Jr., Ph.D., M.D.
 Bernard Pollara, Ph.D., M.D.
 James F. Koerner, Ph.D.

Associate Professor

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

- 104. Physiological Chemistry.** (7 cr; 110 hrs; \$5 physiological chemistry card must be purchased from bursar; laboratory desks will not be assigned until this card is presented; cost of special chemicals, nonreturnable equipment, and breakage will be charged against the deposit) Singer, Koerner, Carlson
105. Physiological Chemistry. (5 cr; 50 hrs) Singer and Koerner

Physiology

Professor

Maurice B. Visscher, M.D., Ph.D., *chairman*
 Eugene D. Grim, Ph.D.
 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.

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

Assistant Professor

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

Associate Professor

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

Lecturer

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

GENERAL INFORMATION

Graduate work through the School of Dentistry and the Graduate School of the University of Minnesota is offered at both the master of science and doctor of philosophy levels.

The M.S. program is designed to meet dentistry's need in two areas. The first concerns the preparation of qualified teachers and investigators in the various branches in dentistry. The second is for the preparation of fully trained specialists for the different dental fields. The major is in some special phase of dentistry and usually the minor is in a basic medical science. Some fellowships, teaching assistantships, and teaching associateships are available for graduate students pursuing the M.S.D. degree.

The Ph.D. program has been developed to educate competent teachers and research workers. In this type of program, the major is in a basic medical science and the minor is in a special area of dentistry. The Ph.D. can be earned in post-sophomore and postdoctoral programs which are supported by a grant that provides stipends and free tuition for qualified students.

Program for the Degree of Master of Science in Dentistry

Requirements for Enrollment

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.

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 himself shall make the majority of the original observations upon which the thesis is based, except in unusual cases where the problem would not permit.

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

The Master's thesis must be typewritten in quadruplicate, two copies on 20-pound linen stock of 75 per cent rag content, the others on 13-pound bond paper. Samples of the paper required should be examined in the office of the dean of the Graduate School. The original and first copy must contain all illustrative material. Ample margins should be left for binding purposes. The body of the thesis should be double spaced, but footnotes may be single spaced. A copy of the thesis, certified by the adviser as complete, must be registered in the dean's office at least 8 weeks before graduation. (Students should consult the Graduate School office for dates when their theses must be registered.) The thesis will be examined by a committee of not less than three appointed by the dean of the Graduate School on recommendation of the Committee on Graduate Dental Education. *Unanimous approval by the thesis committee is necessary for the acceptance of the thesis*, and a record of this approval must be filed in the Graduate School office on the appropriate form before the candidate may be admitted to the final written and oral examinations. The Graduate School in any case should be informed, on the appropriate blank, of the action of the thesis committee.

If the thesis is accepted, the candidate must deposit with the Office of Admissions and Records, at least 5 weeks before the commencement in which he wishes to take his degree, the sum of \$5 for binding two copies of the thesis, which will be catalogued and deposited in the University Library.

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.

Tuition—The tuition fee for graduate work in dentistry is \$155 per quarter for residents and \$330 per quarter for nonresidents. For students who are majoring in the fundamental sciences, the tuition fee is \$91 per quarter for residents and \$245 per quarter for nonresidents.

Course of Study Requirements

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. 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 a special phase of dentistry. The different M.S. programs vary in length of time from 21 to 36 calendar months.

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.

Admission to Candidacy—The student who expects to obtain a Master's degree shall present his program and his thesis title and plan not later than the opening of the quarter preceding the final quarter or final summer term, for his adviser's recommendation and transmission to the Committee for Graduate Dental Education. The Plan A forms are provided by the Graduate School. A transcript of all grades must accompany the program. Approval by the Committee on Graduate Dental Education and the Graduate School indicates the student's admission to candidacy for the degree.

Examinations—In addition to the usual course examinations in all subjects where such are given, the candidate for the Master's degree must pass final written and oral examinations.

The final *written examination* will be held prior to the oral examination. It will cover the major field and may include any work fundamental thereto. It is given by the members of the graduate faculty in the major department, the adviser acting as chairman. In those major fields in which there is representation on the Graduate School faculty from the School of Dentistry and the Mayo Foundation, the examination will be jointly prepared by faculty members from both campuses. The written examinations are generally held on the first Friday of December, March, June, and September although, necessarily, there is flexibility in this schedule.

The final *oral examination* is held when all other requirements for the degree have been met, including the final written examination and the acceptance of the thesis. The examination will be administered by the student's thesis committee. If the student's name is to be included in the commencement program, the oral examination must be completed at least 5 weeks before the commencement in which he expects to take the degree.

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.

Although there is some flexibility in the scheduling of these examinations, they are usually held the second Friday of November, February, May, and August.

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 of Study Available

At present, graduate courses in dentistry are offered in the major fields of oral pathology, oral surgery, orthodontics, restorative dentistry, oral medicine, and periodontics. The M.S.D. degree in one of these major fields can be earned in a program designed exclusively for this degree or as one step in a program leading to the Ph.D. in a basic medical science with a minor in a special area of dentistry.

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 the Degree of Doctor of Philosophy

In the Graduate School, one Doctor's degree, the doctor of philosophy (Ph.D.), is conferred by the University of Minnesota. Work toward this degree in conjunction with the School of Dentistry is offered for the purpose of training teachers and research workers for the various areas of dentistry. In these programs the student selects a major field of study in one of the basic medical sciences. Work in the major field is identical to the required work in the major of Ph.D. programs offered through the Graduate School in conjunction with the various basic medical science departments. The minor field of study, however, is in dentistry and usually in an area of a recognized dental specialty. Work in the minor field is similar to the requirements of programs leading to the degree of master of science in dentistry offered through the Graduate School in conjunction with the School of Dentistry.

This training is offered under two separate programs. In the first program, qualified dental students enroll in the Graduate School at the end of the sophomore year of dental school. For a minimum of the next 3 full years these students register concurrently in both the School of Dentistry and the Graduate School. At the end of 3 years, work toward the D.D.S. degree is completed. Work toward the Ph.D. degree and M.S.D. training is completed at the end of a minimum of 3 additional years. A stipend of \$2,200 per year is available for the first 3 years. Stipends ranging from \$6,000 to \$6,500 per year plus dependency allowances are available for the second 3 years and tuition is paid throughout the program.

In the second type of program, graduates holding a D.D.S. or D.M.D. degree also may work toward a Ph.D. degree. The major field of study also is selected in one of the basic medical science departments and the minor is in dentistry as described above. Stipends ranging from \$5,500 to \$6,500 per year plus dependency allowances are available and tuition is paid in this program.

Further information regarding these programs may be secured 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) Yamane
- 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) Yamane
- 232f,w,s,su. Research Problems in Oral Medicine.** (Cr and hrs ar) Yamane
- 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. (4 cr) Gorlin and staff

- 262f,w,s,su. **Research in Oral Pathology.** (Cr and hrs ar) Gorlin
 263f,w,s. **Seminar: Oral Pathology.** (1 cr) Gorlin
 265. **Seminar: Oral Pathology Slides.** (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. (1-3 cr; limited to 8 students; offered alt yrs) Gorlin
 267. **Oral Pathology—Advanced Human Genetics.** (1 cr; offered alt yrs) Gorlin
 268. **Oral Pathology Literature Review.** (1 cr) 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. **Seminar: Oral Surgery.** (1 cr) Clark and staff
 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, Paulson, and staff
 201f,w,s,su. **Treatment Procedures in Orthodontics.** (Cr and hrs ar) Steadman, Simpson, Paulson, and staff
 202f,w,s,su. **Case Analysis.** (Cr and hrs ar) Steadman, Simpson, Paulson, and staff
 203f,w,s,su. **Treatment Planning.** (Cr and hrs ar) Steadman, Simpson, Paulson, and staff
 204f,w,s,su. **Advanced Clinical Orthodontics.** (Cr and hrs ar) Steadman, Simpson, Paulson, and staff
 205f,w,s,su. **Osteology and Myology of the Head.** (Cr and hrs ar) Steadman
 206f,w,s,su. **Growth and Development of the Head.** (Cr and hrs ar) Steadman
 207f,w,s,su. **Comparative Odontology.** (Cr and hrs ar) Steadman
 208f,w,s,su. **Seminar: Orthodontics.** (Cr and hrs ar) Steadman, Simpson, Paulson, Isaacson, and staff
 209f,w,s,su. **Problems and Research in Orthodontics.** (Cr and hrs ar) Steadman, Isaacson
 210f,w,s,su. **Principles of Orthodontic Retention.** (Cr and hrs ar) Steadman, Simpson, Paulson, and staff
 211f,w,s,su. **Advanced Clinical Orthodontic Retention.** (Cr and hrs ar) Steadman, Simpson, Paulson, and staff
 212f,w,s,su. **Orthodontic Prognosis.** (Cr and hrs ar) Steadman, Simpson, Paulson, and staff
 213f,w,s,su. **Clinical Orthodontic Prognosis.** (Cr and hrs ar) Steadman, Simpson, Paulson
 214f,w,s,su. **Advanced Orthodontic Seminar.** (Cr and hrs ar) Steadman, Simpson, Paulson, Isaacson, and staff

Periodontics

- 280f,w,s,su. Advanced Periodontics Clinic.** Practical work in the clinic in examination, diagnosis, treatment planning, and treatment of periodontal disease. It includes the practice of curettage, splinting teeth, periodontal surgery, and treating traumatic occlusion. (Cr and hrs ar) Schaffer and staff
- 281f,w,s. Advanced Periodontics Lectures.** Consideration of the tissues involved in periodontal disease, and the 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: Periodontics.** Etiology of periodontal disease, histopathology of periodontal symptoms, treatment of periodontal disease, research in periodontics. (12 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,s. Histochemistry of the Normal and Pathologic Periodontium.** (2 cr) Staff
- 286su. Bacteriology of Periodontal Diseases.** (2 cr) Korn and 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, Morstad, Wittich, Yock
- 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, Morstad, Wittich, Yock
- 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) Jensen, Morstad, Wittich, Yock

PROGRAM IN DENTAL HYGIENE

GENERAL INFORMATION

The Program in Dental Hygiene was established to fill the need for skilled personnel 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 Minnesota and in a number of other 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 by their private physician. 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 plan to enter the Program in Dental Hygiene, should consult the advisers in dental hygiene. 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 Liberal 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, Minnesota 55455.

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	\$ 85.00
Nonresidents	240.00
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 \$7.25 per credit for residents, \$20 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.

American Dental Hygienists Association—The association administers four scholarships for well-qualified second-year dental hygiene students. These funds are awarded on a national competitive basis. Application may be made through the Dental Hygiene office in the School of Dentistry.

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	
MdBc 30—Biochemistry	4	44					4	44	
Phsl 2—Human Physiology			4	55			4	55	
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	
DH 62—Dental Roentgenology						2	33	2	33
	17½	242	21	352	16	308	54½	902	
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	
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	
Phcl 1—Dental Therapeutics			2	33			2	33	
PEW 25—Standard and Advanced First Aid					2	22	2	22	
DH 64—Lecture in Periodontology			1	11			1	11	
	20	363	16	330	14	308	50	1001	

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.

Instructor

Patricia J. Peterson, G.D.H., B.A.

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, Peterson
- 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, dental 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, Peterson
- 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
- 64. Lecture in Periodontology.** A review of the anatomy, histology, and physiology of the supporting structures of the teeth; physiotherapy; classification, etiology, and treatment of periodontal diseases. (1 cr; 1 lect hr a wk) Schaffer and staff

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

Biochemistry (MdBc)

- 30. Elements of Biochemistry.** (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

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 three or four short stories first quarter; three 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

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

Pharmacology (Phcl)

1. **Dental Therapeutics.** 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)

2. **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; prereq 1 qtr zoology or biology, 1 qtr chemistry; 3 lect hrs and 2 dem hrs a wk) 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 Theatre 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 three 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 Morrill Hall, University of Minnesota, Minneapolis, Minnesota 55455. Applicants must be young women between 18 and 35 years of age, and must be able to pass a physical examination. 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

	Cr	Hrs
FALL QUARTER		
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—Seminar: Dental Assisting	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—Seminar: Dental Assisting	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.

Assistant Professor

Helen M. Tuchner, B.A.

- 1X. **Oral Anatomy and Laboratory Procedures.** Study of bones, muscles, glands of head and neck. Identification, development, and anatomical description of teeth. Classification and use of impression materials. Technics of investing 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 teeth. (1 cr) Thorson
- 6X. **Prosthetic Laboratory Procedures.** Properties and uses of impression materials. Basic prosthetic techniques. (2 cr; 1 lect and 1 lab a wk) Tuchner, 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. **Seminar: Dental Assisting.** Correlated series of lectures based on the clinical approach of the dental assistant to the various fields of dentistry. Lectures as assigned.
- 14X. **Seminar: Dental Assisting.** 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)

Supplement to the
UNIVERSITY OF MINNESOTA BULLETIN
SCHOOL OF NURSING, 1963-1965

**Notice of Change in First-Year Course Requirements for
Plan B—Basic Professional Nursing Program**

The following first-year course requirements for Plan B of the Basic Professional Nursing Program are effective as of September 1964. This statement replaces that which appears on page 20 of the 1963-1965 School of Nursing bulletin.

PLAN B

First-Year Course Requirements

(Quarter credits shown in parentheses)

The minimum quarter-credit requirement for the first year is 45 plus a current Red Cross first aid certificate for the standard course. Of these 45 quarter credits, 36 must be distributed as follows:

Group A—Freshman English (3 qtrs)

Group B or E—Foreign language or humanities (8)

Group C—Social science: Anth 2A required (8)

Group D—Natural science: GeCh 4 and 5 (10); NSci 3 (5)**

The remaining credit requirement must be fulfilled by selections from any of groups B, C, D, and E described below:

A. Freshman English

Engl A-B-C—Freshman Literature and Composition (composition portion) (6)

(or) Engl 1A-2A-3A—Freshman English (composition portion) (6)

(or) Engl 1B-2B-3B—Freshman English (composition portion) (9)

(or) Comm 1-2-3—Communication (12)

(or) Exemption from requirement

(All students are required to have an English Classification Card before registration for one of these courses)

** Students who transfer from another college may substitute 5 quarter credits of general biology.

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October 1, 1964

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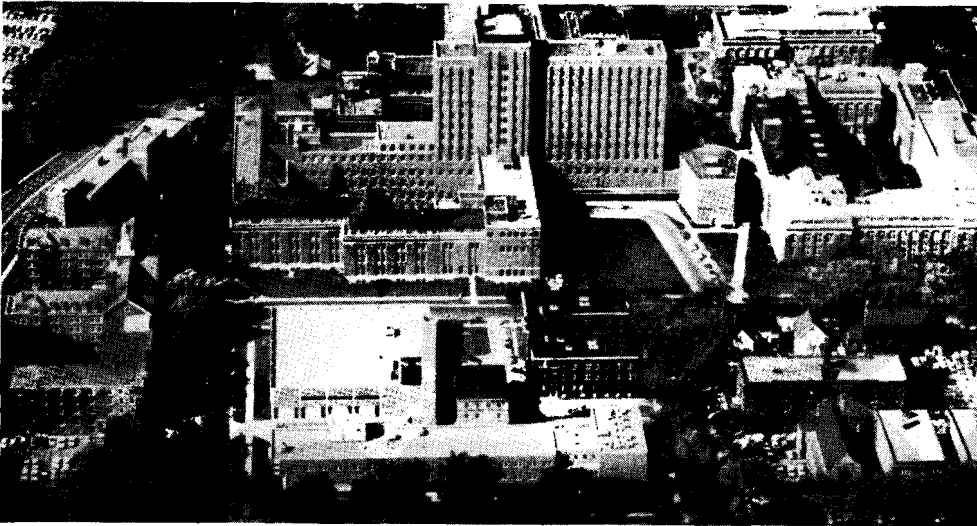
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MEDICAL SCHOOL

75th Anniversary • 1965



1964-1967

UNIVERSITY OF MINNESOTA BULLETIN

UNIVERSITY OF MINNESOTA

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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, Minnesota 55455.

About the Medical School

The first classes in medicine at the University began in 1888 when three of the four 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, Veterans of Foreign Wars Cancer Research Center, and the Children's Rehabilitation Center.

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 Hennepin County 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.

Library facilities and services are readily available to medical students and staff in the Bio-Medical Library housed in Diehl Hall, immediately adjacent to the Medical School and the University Hospitals. The library contains extensive collections of periodical reference material and subscribes regularly to more than 1,500 periodicals. There are in excess of 165,000 volumes in the library, almost all of which are shelved on open stacks. A medical historical collection contains many unique items. Departmental libraries within the Medical School supplement the Bio-Medical Library collections. The services of the Walter Library, the main library on the University campus, are available to and are used freely by students and staff.

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 year, 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 with examination of patients and discussion of selected clinical problems in medicine at the University Hospitals or at one of the affiliated hospitals. The emphasis is on the pathophysiology of disease, on the production of significant symptoms and signs and on the detection of biochemical alterations by clinical laboratory methods.

Throughout these first 2 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.

During the succeeding 2 years the focus of the student's program shifts from the laboratory to the patient. Bedside instruction on hospital wards and in the clinics

enlarges the student's experience and knowledge of the problems of the sick. He learns how to recognize and treat illness and learns about the many ways to help patients seeking relief from symptoms of disease and discomfort. Certain regular lecture-demonstrations are available to the student but the chief learning experience comes from study of patients assigned. Scheduled time is arranged to facilitate the individual instruction which is a necessary part of this kind of learning experience.

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, Hennepin County General, or Veterans. On these assignments the student participates in the diagnosis and treatment of patients as a member of the clinical team engaged in the treatment of patients.

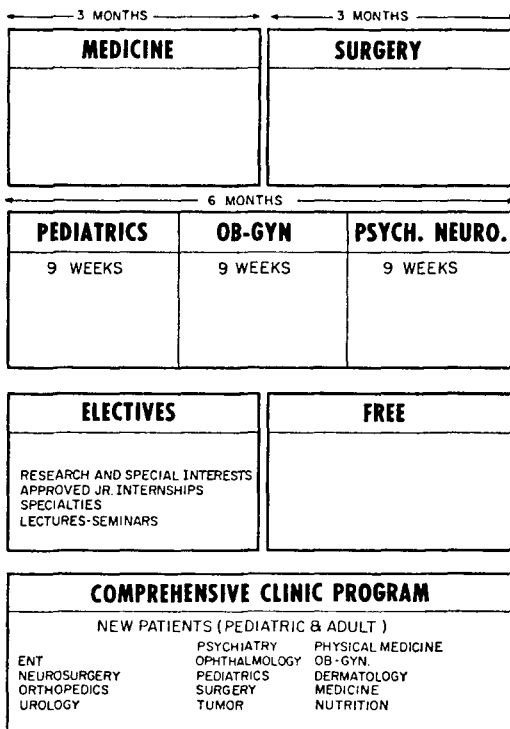


Diagram of Junior-Senior Biennium in one of several possible variations

The 2-year period is divided into 8 quarters of approximately 3 months each, approximately 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 clerkships; 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. In special cases, free and/or elective time may be arranged during the junior year.

Didactic or lecture room instruction for entire classes has been reduced to 4 or 5 lecture hours each week in the junior-senior biennium. Most of the lectures are given in a single afternoon, so as to interfere as little as possible with the various clerkship, clinic, or elective time responsibilities.

JUNIOR LECTURE SCHEDULE

	Summer	Fall	Winter	Spring
Wednesday 1-4 p.m.	Medicine 104, Pediatrics 120 on alternate weeks			
	Obstetrics 120			
	Surgery and Surgical Specialties 122, 129, 127, 173			
	Ophthalmology 100, Medicine 123 on alternate weeks			
Saturday 8 a.m.	Neuropsychiatry 101			

SENIOR LECTURE SCHEDULE

	Summer	Fall	Winter	Spring
Wednesday 4 p.m.	Surgery and Surgical Specialties 127, 129, 140, 173			
Wednesday 5 p.m.	Otology 101	Otology 101	Physical Medicine 122	Public Health 142
Saturday 8 a.m.	Anesthesiology 101	Radiology 126		
Saturday 9 a.m.		Neuropsychiatry 122	Pharmacology 105	Public Health 142

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 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 out-patient 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. 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.

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. This is 135 quarter credits or 90 semester hours of college credit.

The medical graduate has an increasing responsibility to understand and deal with the social and cultural forces of his environment. Scientific background and training alone are not sufficient to meet this need and studies in the general field of humanities are required so that 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. The outline presented should be recognized as suggesting minimum requirements only. It is to the applicant's advantage to go beyond these minimums in his college career.

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 following table lists *minimum* course requirements and credits.

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 in the office of the dean will be pleased to discuss premedical programs with college students, teachers, and advisers, either in person or through correspondence. A useful reference booklet which contains a summary of the admission requirements, the timetable and details about application to the Medical School of the University of Minnesota as well as summaries of requirements of other medical schools in the United States and Canada can be purchased from the Association of American Medical Colleges, 2530 Ridge Avenue, Evanston, Illinois, and is available in most college reference libraries.

MINIMUM REQUIREMENTS

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

Residence

Preference for admission to the Medical School is given to residents of Minnesota and to residents of neighboring states that do not have 4-year medical schools. Nonresidents from other areas may be accepted providing their scholarship is outstanding and other qualifications indicate unusual promise for a career in medicine.

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, Minnesota 55455. These forms should be completed during the *year before* the student plans to enter the Medical School; they must be forwarded to the University after May 15, but 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 three or four 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 with the exception of students transferring following completion of 2 years of medical school elsewhere. These are standard tests of personality characteristics and 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 only the individual's factual knowledge but are designed to help the admissions committee learn more about the candidate's aptitudes and suitability for training in medicine.

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 1966 should plan to take the MCAT in May or October of 1965. 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 several 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 admissions 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 special 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 their medical education. 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 in the Medical School office. The student will be asked to make formal application including transcripts of premedical credits.

Special arrangements are in effect with the 2-year medical schools in North and South Dakota which 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 Liberal 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. 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 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 a number of qualified students who have been accepted by the faculties for the combined program. Stipends for the combined program begin at a level of \$2,800 plus dependency allowances and Graduate School tuition. Students are accepted for stipend support under the M.D.-Ph.D. program usually 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. These students must be eligible for admission to the Graduate School in a basic medical science department.

All of the basic medical science departments conduct active and extensive graduate research and 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 or other 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 announced 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, Hennepin County 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 Graduate School of Medicine in Rochester, Minnesota, is affiliated with the Graduate School of the University. Graduate physicians engaged in post-doctoral training and research in Rochester may receive graduate credit for their work and be awarded advanced degrees from the University.

Approximately 400 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 are receiving graduate credit 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 \$155 per quarter for residents of Minnesota for the academic year 1964-65. Nonresident tuition is \$330 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.

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, federal loans to students of the health professions, 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 designing 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 office is located in Room 1342, Mayo Memorial.

The foundation 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 2,300 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

Arnold Lazarow, M.D., Ph.D.
R. Dorothy Sundberg, M.D., Ph.D.
Lemen J. Wells, Ph.D.

Associate Professor

Anna-Mary Carpenter, M.D., Ph.D.
William J. L. Felts, Ph.D.
Carl B. Heggstad, M.D., Ph.D.
Morris Smithberg, Ph.D.
Richard C. Wood, Ph.D.

REQUIRED COURSES

100f-101w.† Gross Human Anatomy. Dissection, including osteology. (6 cr for 100, 8 cr for 101; prereq regis med fr or grad with # for 100, 100 for 101)

103f-104s.† Human Histology. The microscopic structure, and the cytochemical and functional aspects of cells, tissues, and organs. (7 cr for both qtrs; prereq regis med fr or grad with # for 103, 103 for 104)

107w. Human Embryology. Development of the human body. (4 cr; prereq regis med fr or grad with #)

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 with # 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 1965-66 and alt yrs)

132. Experimental Study of the Fetus. (Cr ar; prereq #)

- 140f. **Skeletal Tissue Biology.** Gross and microscopic anatomy of the skeletal tissues, their origin and development. Students present literature in their particular areas of interest. (2 cr; prereq #)
149. **Experimental Neuroanatomy.** Morphology of the central nervous system as determined by experimental methods. (Cr and hrs ar; prereq #)
- 153, 154, 155, 156. **Advanced Anatomy.** Gross anatomy, histology, embryology, cytochemistry, hematology, neuroanatomy, or experimental morphology. (Cr ar; prereq #)
160. **Introduction to Histological and Morphologic-Histochemical Techniques.** Fixation, embedding, and staining of cytological components and enzymes. (2 cr; prereq 103-104, #)
161. **Experimental Cytochemistry.** (Cr ar; prereq 103, 104, MdBc 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 students; prereq 103, or Zool 54 or # for 165...165, # for 166)
167. **Seminar: Hematology.** Discussion of literature and research. (1 cr; prereq 166)
180. **Endocrinology of the Reproductive Tract.** Relationship of endocrines to reproduction studied by use of the experimental techniques of physiology, cytochemistry, and radioautography. (Cr and hrs ar; prereq 103, 104, MdBc 100-101, #)
- 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.

Clinical Assistant Professor

Robert C. Knutson, M.D., M.S.

Instructor

Charles F. Galway, M.D., C.M., M.S.
John R. Gordon, M.D., M.S.
Van S. Lawrence, M.D.
John S. Rydberg, M.D., M.S.
Hugh D. Westgate, M.D., M.S.

Clinical Instructor

Russell W. Bagley, M.D.
Edward G. Hustad, M.D.
J. Albert Jackson, M.D.
Egon Marte, M.D.

REQUIRED COURSES

101. **Principles of Anesthesia Lectures.** (1 cr; prereq regis med)

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**

Biochemistry (MdBc)

Wallace D. Armstrong, Professor and Head

Professor

Wallace D. Armstrong, M.D., Ph.D.
Cyrus P. Barnum, Jr., Ph.D.
Ellis S. Benson, M.D.
Ivan D. Frantz, M.D., Ph.D.
Ralph T. Holman, Ph.D.
Leon Singer, Ph.D.

Associate Professor

Charles W. Carr, Ph.D.
Helmut R. Gutmann, Ph.D.
Frank Ungar, Ph.D.
John F. Van Pilsun, Ph.D.
Richard W. Von Korff, Ph.D.
Donald B. Wetlaufer, Ph.D.

Assistant Professor

Curtis H. Carlson, M.D., Ph.D.
Ernest D. Gray, Ph.D.
James F. Koerner, Ph.D.
Bernard Pollara, M.D., Ph.D.
George J. Schroeffer, Jr., M.D., Ph.D.

Lecturer

Ulysses S. Seal, Ph.D.
Quenton T. Smith, Ph.D.

Instructor

Mary E. Dempsey, Ph.D.

REQUIRED COURSES

100f. Physiological Chemistry. (8 cr; prereq regis med fr, physics, and organic chemistry)

101w. Physiological Chemistry. (8 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. Protein Chemistry
- 218. Physical Methods in Biopolymer Research
- 236. Seminar: Radioactive Isotopes

Laboratory Medicine (LMed)

Gerald T. Evans, Professor and Head

Professor

Ellis Benson, M.D.
Gerald T. Evans, M.D.C.M., Ph.D.
Ruth Hovde, M.S.
R. Dorothy Sundberg, Ph.D., M.D.

Associate Professor

Robert Bridges, M.D.
Esther Freier, M.S.
Edmond Yunis, M.D.

Assistant Professor

Patricia Bordewich, M.S.
 Grace Mary Ederer, M.P.H.
 Lorraine Gonyea, M.S.
 Elaine McMaster, M.S.
 Verna Rausch, M.S.
 Paul Strandjord, M.D.
 Jorge Yunis, M.D.

Instructor

Frances Casey, B.S.
 Kathleen Clayson, B.S.
 Marie Dammann, B.S.
 Joycelyn Duncan, B.S.

Kathryn Hammer, M.S.
 Jean Jorgenson, B.S.
 Arthur Sanders, B.A.
 Lila Wengler, B.S.

Clinical Assistant Professor

Leonard Crowley, M.D.
 Edward Segal, M.D.
 Martin Segal, M.D.

Clinical Instructor

Paul Finley, M.D.
 Aina Galejs, M.D.

REQUIRED COURSES

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

ELECTIVE COURSES

- 180. Problems in Fluid and Electrolyte Metabolism.** (Cr ar; prereq regis med)
181. Problems in Clinical Laboratory Medicine. (Cr ar; prereq regis med)
182. Topics in Hematology. (Cr ar; prereq regis med)
183. Topics in Immunology. (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**Professor**

Ivan D. Frantz, M.D.
 Wendell H. Hall, M.D., Ph.D.
 James F. Hammarsten, M.D., M.B.
 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.
 Louis Tobian, Jr., M.D.
 Cecil J. Watson, M.D., Ph.D.
 Leslie Zieve, M.D., M.A.

Frederick C. Goetz, M.D.
 Dennis J. Kane, M.D.
 B. J. Kennedy, M.D., M.S.
 Frank M. MacDonald, M.D.
 Richard M. Magraw, M.D.
 Harold G. Muchmore, M.D.
 M. John Murray, M.D.
 Alvin L. Schultz, M.D.
 Naip Tuna, M.D., Ph.D.
 Yang Wang, M.D.
 C. Paul Winchell, M.D.
 Horace H. Zinneman, M.D.

Clinical Professor

Reuben Berman, M.D., M.S.
 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.

Clinical Associate Professor

Donald S. Amatzio, M.D.
 Karl W. Anderson, M.D., M.S.
 Rolf L. Andreassen, M.D.
 Paul J. Bilka, M.D.
 Joseph F. Borg, M.D.
 Sumner S. Cohen, M.D.
 David M. Craig, M.D.
 William R. Fifer, M.D.
 Richard J. Frey, M.D.
 Delmar R. Gillespie, M.D.

Associate Professor

Carl S. Alexander, M.D.
 James B. Carey, Jr., M.D., Ph.D.
 N L Gault, Jr., M.D.

Robert A. Green, M.D.
 Mark C. L. Hanson, M.D.
 Douglas P. Head, M.D.
 William H. Hollinshead, M.D.
 Howard L. Horns, M.D.
 Milton M. Hurwitz, M.D., M.S.
 Wyman E. Jacobson, M.D.
 John W. LaBree, 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.
 George C. Roth, M.D.
 L. Raymond Scherer, M.D.
 Philip A. Soucheray, M.D.
 Horatio B. Sweetser, Jr., M.D.
 A. Boyd Thomes, M.D.
 Lowell W. Weber, 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.
 Richard B. Davis, M.D., Ph.D.
 Alfred Doscherholmen, M.D., Ph.D.
 Alfred Eichenholz, M.D.
 Abraham Falk, M.D.
 John W. Jenne, M.D., Ph.D.
 James P. Lillehei, M.D.
 Robert O. Mulhausen, M.D.
 Ralph C. Williams, Jr., M.D.

Clinical Assistant Professor

Robert D. Blomberg, M.D.
 Henry B. Blumberg, M.D.
 Donald G. Bohn, M.D.
 James C. Dahl, M.D.
 Robert E. Doan, M.D.
 Edmund P. Eichhorn, M.D.
 John G. Fee, M.D.
 Benjamin F. Fuller, Jr., M.D.
 Albert J. Greenberg, M.D.
 Earl Hill, M.D.
 John E. Holt, M.D.
 Wayne L. Hoseth, M.D.
 Martin E. Janssen, M.D.
 Herbert W. Johnson, M.D.
 John W. Johnson, M.D.
 David G. Jones, M.D.
 Walter F. Larrabee, Jr., M.D.
 George X. 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.
 Dwight L. Martin, 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.
 Alan P. Rusterholz, M.D.
 Joseph M. Ryan, M.D.
 Raymond W. Scallen, M.D.
 Marguerite Schwyzer, M.D.

Andrew W. Shea, M.D.
 Donald B. Swenson, M.D.
 Francis B. Tiffany, M.D.
 Richard B. Tregilgas, M.D.
 Frank A. Ubel, M.D.
 A. Cabot Wohlrahe, M.D.

Instructor

Graham Beaumont, M.D.
 Ausma S. Blumentals, M.D.
 John H. Burns, M.D.
 Thaddeus Chao, M.D.
 Richard P. Doe, M.D.
 Robert S. Eliot, M.D.
 Joyce L. Funke, M.D.
 Robert P. Gruninger, M.D.
 Maynard E. Jacobson, M.D.
 Henry A. Johnsen, Jr., M.D.
 John I. Levitt, M.D.
 Robert J. McCollister, M.D.
 Harold D. Miller, M.D.
 Thomas F. Mulrooney, M.D.
 Byron U. Musa, M.D.
 Frank Q. Nuttall, M.D.
 Richard A. Pfohl, M.D.
 Harold G. Richman, M.D.
 Jane Self, M.D.
 Marcus B. Shook, M.D.
 William R. Swaim, M.D.
 Nejat Turkbas, M.D.
 Frank A. Wollheim, M.D.
 John W. Yarbro, M.D.
 Solomon J. Zak, M.D.

Clinical Instructor

Alfred F. Anderegg, M.D.
 David Berman, M.D.
 Henry S. Bloch, M.D.
 Paul F. Bowlin, M.D.
 John G. Bradley, M.D.
 Rene Braun, M.D.
 Robert Breitenbucher, M.D.
 John B. Cardle, M.D.
 Malcolm D. Clark, M.D.
 Ephraim B. Cohen, M.D.
 Henry W. Cohen, M.D.
 Donald E. Derauf, M.D.
 David K. Drill, M.D.
 Donald A. Duncan, M.D.
 Hugh A. Edmondson, M.D.
 Rodney W. England, M.D.
 John N. Ferguson, M.D.
 David L. Fingerman, M.D.
 Stanley A. Fruchtman, M.D.
 A. S. Gilbertsen, M.D.
 Muharrem Gokcen, M.D., Ph.D.
 David Gold, M.D.
 Benjie L. Goldfarb, M.D.
 William L. Hedrick, M.D.
 Wilbert J. Henke, M.D.
 Kjeld O. Huseby, M.D.
 Harold B. Kaiser, M.D.
 Harold A. Kaplan, M.D.
 Markle Karlen, M.D.
 Everett H. Karon, M.D.
 Joseph R. Kelly, M.D.
 Charles P. Kolars, M.D.
 Elliot M. Latts, M.D.
 Arthur T. Lindeland, M.D.
 Jeanette K. Lowry, M.D.
 Aaron L. Mark, M.D.
 Robert A. Maslansky, M.D.

James L. McKenna, M.D.
 Winston R. Miller, M.D.
 William D. Nessel, M.D.
 Franklin C. Norman, M.D.
 William F. Nuessle, M.D.
 William A. O'Brien, M.D.
 Earl T. Opstad, M.D.
 William J. Paule, M.D.
 Frank S. Preston, Jr., M.D.
 David A. Randall, M.D.
 Thomas M. Recht, M.D.
 Paul D. Redleaf, M.D.
 William D. Remole, M.D.
 A. McDonnell Richards, M.D.
 Rudolph J. Ripple, M.D.
 James A. Ronan, Jr., M.D.

Ronald J. Rosandich, M.D.
 Donald O. Schultz, M.D.
 Richard W. Swenson, Jr., M.D.
 Donald G. Vellek, M.D.
 J. A. Vennes, M.D.
 Harold M. Wexler, M.D.
 F. Douglas Whiting, M.D.
 Richard C. Woellner, M.D.
 Donald W. Woodley, M.D.

Lecturer

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

Clinical Assistant

Lawrence V. Perlman, 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, arthritis, 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, immunology, cardiovascular and pulmonary disease, experimental hemodynamics. 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, immunology, cardiovascular and pulmonary disease, clinical hemodynamics. 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
- 214. Seminar: Cardiovascular

Division of Dermatology

Francis W. Lynch, Professor and 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.
Isadore Fisher, M.D., M.S.
Robert W. Goltz, M.D.
Harold G. Ravits, M.D.
John G. Rukavina, M.D.

Clinical Assistant Professor

Frederic T. Becker, M.D.
Elmer H. Hill, M.D.
Irvine M. Karon, M.D.
Elmer M. Rusten, M.D.
Alvin S. Zelickson, 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.
Thomas J. Kalb, M.D.
Sheldon L. Mandel, M.D.
Orville E. Ockuly, M.D., M.S.
Milton Orkin, M.D.
Willard C. Peterson, Jr., M.D.
Nadine C. Smith, M.D.
James L. Tuura, M.D.
C. Gordon Vaughn, M.D.

REQUIRED COURSES

- 123. Dermatology and Syphilology. Clinical lectures on common skin diseases and syphilis; diagnosis and treatment. (2 cr; prereq 101)

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
- 229. Experimental Methods in Dermatology
- 230. Functional Biology of the Skin

Microbiology (MicB)

Dennis W. Watson, Professor and Head

Professor

S. Gaylen Bradley, Ph.D.
Robert A. Good, M.D.
James J. Jezeski, Ph.D.
Joseph C. Olson, Ph.D.
Edwin L. Schmidt, Ph.D.
John Spizizen, Ph.D.
Dennis W. Watson, Ph.D.

Associate Professor

K. Gerhard Brand, M.D.
Martin Dworkin, Ph.D.
Louis H. Muschel, Ph.D.
Palmer Rogers, Ph.D.
Joseph V. Scaletti, Ph.D.

Assistant Professor

Dwight L. Anderson, Ph.D.
 Robert W. Bernlohr, Ph.D.
 Brooks D. Church, Ph.D.
 Joseph W. St. Geme, M.D.
 John E. Verna, Ph.D.

Instructor

Roswell S. Coles, Ph.D.
 N. Jacqueline Ellis, Ph.D.
 Russell C. Johnson, Ph.D.
 Terence M. Joys, Ph.D.
 Mary E. Pollock, Ph.D.
 James T. Prince, M.S.
 Waide Rogers, M.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, MdBc 100 or 101 or BioC 120 for 105...105 for 106) 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 1964-65 and alt yrs) Bradley

111s. Experimental Microbiology. An advanced laboratory study in comparative morphology, taxonomy, and physiology of bacteria. Stress enrichment, isolation, identification, cultivation, structure, and functions of microorganisms. (5 cr; prereq 53, 121 and #) Church

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 1965-66 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; homotransplantation and tumor immunity; mechanisms of natural and acquired immunity. (3 cr; prereq 53) Watson

116Aw. Immunology Laboratory. (2 cr; prereq #116) 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

122. Physiology of Bacteria Laboratory. Bacterial physiology and metabolic analysis techniques. (3 cr; prereq 121 or #; offered 1st term SS only) Bernlohr, Rogers

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) Verna

153f. Biology of Microorganisms. Lectures, demonstrations, and laboratory exercises in taxonomy, anatomy, physiology, biochemistry, and ecology of microbes. Emphasis is on the fundamental properties of bacteria. (4 cr; prereq 4 cr in biological sciences, OrCh 61, 62 or #) Dworkin

201f,w,s. Research in Microbiology

202f,w,s. Diagnostic Microbiology

- 203f,w,s. Seminar
- 205f,w,s. Advances in Immunology
- 206f. Laboratory Methods, Applied Animal Cell Culture and Virology
- 207f. Advanced Medical Microbiology
- 223s. Bacterial Metabolism

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

William D. Cohen, M.D.
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

Fred A. Lyon, M.D.
Henry C. Meeker, M.D.
William N. Spellacy, M.D.

Clinical Instructor

Milton Abramson, M.D., Ph.D.
Melvin P. Baken, Jr.
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.
Edward C. Maeder, M.D., Ph.D.
Nicholas M. Mensheha
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; prereq regis med jr)
- 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 (Opth)

John E. Harris, Professor and Head

Professor

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

Clinical Associate Professor

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

Robert H. Monahan, M.D.

Karl E. Sandt, M.D.

Harry G. Sperling, Ph.D.

(Ophthalmic Research)

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

Assistant Professor

William L. Fowlks, Ph.D.

(Ophthalmic Research)

William H. Knobloch, M.D., M.S.

Donald I. Tepas, Ph.D.

(Ophthalmic Research)

Research Associate

Donald F. Clausen, Ph.D.

Clinical Assistant Professor

Frank Adair, M.D.

Llewellyn E. Christensen, M.D.

Robert R. Cooper, M.D.

Robert J. Fink, M.D.

Harry S. Friedman, M.D.

Joseph L. Garten, M.D.

Richard C. Horns, M.D., M.S.

Bourne Jerome, M.D.

Douglas L. Johnson, M.D.

Bruce L. Kantar, M.D., M.S.

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

Vernon L. Lindberg, M.D.

Winston R. Lindberg, M.D.

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

John A. McNeill, M.D.

Thomas O'Kane, M.D.

Harry L. Plotke, M.D.

Robert E. Rocknem, M.D.

Irving Shapiro, 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 Udasco, M.D.

Clinical Instructor

Wilfred J. Bushard, M.D.

Richard Ellingson, M.D.

Donald W. Herrick, M.D.

George Hilgerman, M.D.

Charlotte Hill, M.D.

Robert P. Koenig, M.D.

Ernest Larson, M.D.

Lydia Neibergs, M.D.

Sidney Nerenberg, M.D.

Thomas K. Rucker, M.D.

Donald Sterner, M.D.

Richard Student, M.D.

Frederick C. Wuest, M.D.

REQUIRED COURSES

100. Ophthalmology. Lectures and demonstrations. (2 cr; prereq regis med)

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.A., M.D.
Henry B. Clark, Jr., D.D.S., M.D.
Frank M. Lassman, Ph.D.
(Audiology and Speech)
Henry L. Williams, Jr., M.D.

Clinical Professor

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

Associate Professor

W. Dixon Ward, Ph.D. (Hearing Research)

Clinical Associate Professor

Conrad Holmberg, M.D.

Assistant Professor

Arndt J. Duvall III, M.D., M.S.

Clinical Assistant Professor

Benjamin Bofenkamp, M.D.
John Glaeser, M.D.
Bradley Kusske, M.D.
Douglas R. Kusske, M.D.
Kurt Pollak, M.D.
Graham C. Smith, M.D., M.S.

Clinical Instructor

John S. Huff, M.D.
Malcolm R. Johnson, M.D.
Robert Koller, M.D.
Hyman M. Paisner, M.D.
Robert Richardson, M.D.
Douglas D. Robertson, M.A. (Audiology)
George V. Tangen, M.D., M.S.

REQUIRED COURSES

- 101. Otolaryngology. Lectures and demonstrations. (2 cr per yr; prereq regis med)

ELECTIVE COURSES

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

ADVANCED CREDIT COURSES

- 230. Clinical Otology
- 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.

Erhard Haus, M.D.
 Kenneth A. Osterberg, M.D.
 Robert E. Rydell, M.D.
 Bertram Woolfrey, M.D.

Clinical Professor

Jesse E. Edwards, M.D.

Associate Professor

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

Clinical Associate Professor

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

Instructor

William A. Foley, M.D.
 Donald F. Gleason, M.D.

Clinical Instructor

Charles H. Chedister, 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. (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)
 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

Pediatrics (Ped)

John A. Anderson, Professor and Head

Professor

John A. Anderson, M.D., Ph.D.
 Robert A. Good, M.D., Ph.D.
 Reynold E. Jensen, M.D.
 William Krivit, M.D., Ph.D.
 Lewis Wannamaker, M.D.

Clinical Professor

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

Associate Professor

Paul Adams, M.D.
 Ray C. Anderson, M.D., Ph.D.
 Robert Bridges, M.D.
 Richard Raile, M.D.

Clinical Associate Professor

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

Assistant Professor

Elia Ayoub, M.D.
 Michael E. Blaw, M.D.
 Barbara Burke, M.D.
 Edward C. Defoe, M.D.
 Keith R. Drummond, M.D.
 Robert O. Fisch, M.D.
 Ernest D. Gray, M.D.
 James J. Lawton, M.D.
 James T. Lowman, M.D.
 Harriet Morgart, M.A.
 Arthur Page, M.D.
 Raymond Peterson, M.D.
 Paul Quie, M.D.
 John Reynolds, M.D.
 Joseph St. Geme, M.D.
 Kenneth Swaiman, M.D.
 Homer D. Venters, M.D.
 Robert Vernier, M.D.
 Warren Warwick, M.D.
 James G. White, M.D.
 Francis S. Wright, M.D.

Clinical Assistant Professor

Arnold 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.
 George W. Lund, M.D.
 Edward Nelson, M.D.
 Theodore Papermaster, M.D.
 Theodore Smith, M.D.
 Willis Thompson, M.D.

Lecturer

Allyn Bridge, M.D.
 Jack Hafner, Ph.D.
 Lawrence Meskin, D.D.S.
 Wentworth Quast, Ph.D.
 Richard W. VonKorff, Ph.D.

Instructor

Roswith I. Lade, M.D.
 Alfred Michael, 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 E. Hartman, M.D.
 William Heilig, M.D.
 Harold Katkov, M.D.
 George Kimmel, M.D.
 Stanley Leonard, M.D.
 Wallace Lueck, M.D.
 Jack Markovitz, M.D.
 William Mulholland, M.D.
 Lloyd Nelson, M.D.
 Everett Periman, M.D.
 Sylvester Sanfilippo, M.D.
 Frances E. Schaar, M.D.
 Albert Schroeder, M.D.
 Eva Shapermen, 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; 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. (12 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 infectious 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)

Frederick E. Shideman, Professor and Head

Professor

Raymond N. Bieter, M.D., Ph.D.
 Norman O. Holte, D.D.S.
 Gilbert J. Mannering, Ph.D.
 Frederick E. Shideman, M.D., Ph.D.
 Harold N. G. Wright, Ph.D.

Associate Professor

Frank T. Maher, M.D., Ph.D.
 Jack W. Miller, Ph.D.

Assistant Professor

Elizabeth M. Cranston, Ph.D.
 Akira E. Takemori, Ph.D.
 Travis I. Thompson, Ph.D.

Instructor

Siret H. Ener, Ph.D.
 Ben G. Zimmerman, Ph.D.

REQUIRED COURSES

- 103-104.† General Pharmacology.** Lectures and laboratory exercises on the action and fate of drugs. (10 cr; prereq regis med soph, Phsl 106, 107 or equiv and MdBc 100, 101 or equiv)
- 105. Forensic Medicine and Medical Jurisprudence.** Lectures on the legal aspects of medicine and on laws governing the practice of medicine. (1 cr; prereq regis med sr or ‡)

ELECTIVE COURSES

- 106. Toxicology.** Lectures on the chemistry, action, fate, and detection of toxic substances. (2 cr; prereq 103 and 104 or †104)
- 109. Problems in Pharmacology.** (Cr and hrs ar; prereq ‡)

ADVANCED CREDIT COURSES

201. **Advanced Pharmacology: Physiological Disposition of Drugs.** Principles underlying the absorption, distribution, metabolism, and excretion of drugs. (3 cr; prereq 103 and 104 or #; offered 1965-66 and alt yrs)
202. **Advanced Pharmacology: Pharmacodynamics.** Lectures and laboratory exercises on the physiological, biochemical, and behavioral effects of drugs. Emphasis will be placed on the application of newer techniques to the study of drug action. (3 cr; prereq 103 and 104 or #; offered 1964-65 and alt yrs)
203. **Research in Pharmacology.** (Cr and hrs ar; prereq 103 and 104 or #)
204. **Seminar: Selected Topics in Pharmacology.** (3 cr on completion of 3 qtrs; prereq 103 and 104 or #)
205. **Seminar: Survey of Current Pharmacological Literature.** (3 cr on completion of 3 qtrs; prereq 103 and 104 or #)
206. **Seminar: Psychopharmacology.** Selected topics on the behavioral aspects of drug action. (3 cr on completion of 3 qtrs; prereq #)

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.

Clinical Professor

Miland E. Knapp, M.D.

Associate Professor

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

Clinical Associate Professor

Paul M. Ellwood, Jr., M.D.

Assistant Professor

Marian L. Eliason, B.S.
 Daniel Halpern, M.D.
 Borghild Hansen, B.S.
 Marvin G. Lepley, B.S.
 Romine E. Matthews, Ph.D.
 Wilbur L. Moen, B.S., B.A.
 Richard R. Owen, M.D.
 Helen Skowlund, M.S.
 Auke Tellegen, Ph.D.
 Bror S. Troedsson, M.D.

Clinical Assistant Professor

Ruby C. Overmann, M.A.
 Richard M. Steidl, M.D.

Instructor

John D. Allison, B.S.
 Essam A. Awad, M.D.
 Helen Dahlstrom, B.S.
 Bruce Gutzmann, D.V.M.
 Garland K. Meadows, M.Ed.
 Frank Meelhuysen, M.D.
 Martin O. Mundale, B.S.
 James F. Pohtilla, B.S.
 Allan C. Yater, M.A.

Clinical Instructor

Walter J. Dawson, M.D.
 Joseph P. Engel, M.D., M.S.
 Sara Gault, M.D.
 Michael Kosiak, M.D.
 Arthur B. Quiggle, M.D.
 Herbert A. Schoening, M.D.

REQUIRED COURSES

122. **Physical Medicine and Rehabilitation.** Clinical lectures. (1 cr)

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**
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
- 220. Seminar

Physiology (Phsl)

Maurice B. Visscher, Distinguished Service Professor and Head

Professor

Eugene D. Grim, Ph.D.
 John A. Johnson, 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.
 Irwin J. Fox, M.D., Ph.D.
 Rodney B. Harvey, M.D., Ph.D.

Assistant Professor

James S. Beck, 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

John L. Walker, Ph.D.
 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.
Vera M. Eiden, 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

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

Clinical Associate Professor

Irving C. Bernstein, M.D.
Robert Bush, M.D.
Clifford O. Erickson, M.D.
Walter Gardner, M.D.
Gove Hambidge, Jr., M.D.
Frank Kiesler, M.D.
Otto N. Rath, Jr., M.D.
Clarence J. Rowe, M.D.
Marvin Sukov, M.D.
David Vail, M.D.

Assistant Professor

Titus P. Bellville, M.D.
Floyd Garetz, M.D., M.S.
G. Wendell Hopkins, M.D.
William Jepson, M.D.
Orville H. Johnson, M.D.
H. Douglas Lamb, M.D.
Myron Messenheimer, M.D.
Sonja D. Monson, M.D.
Anthony J. Pollock, Jr., M.D.

Clinical Assistant Professor

Leslie Caplan, M.D.
Robert Clark, M.D.
Louis Flynn, M.D.
Leonard Goldman, M.D.
Joyce S. Lewis, Jr., M.D.
J. Benjamin Lund, M.D.
Robert Pfeiler, M.D.
John Regan, M.D.

Instructor

Ann M. Bailey, M.D.
Edward Bardou, M.D.
Thomas Dredge, Sr., M.D.
Daniel Ferguson, M.D.
Theodore Larson, M.D.
Abelardo Mena, M.D., Ph.D.
Frances Olson, M.D.
Ronald Young, M.D.

Clinical Instructor

Burton Abramson, M.D.
Jerome Bach, M.D.
Donald Daggett, M.D.
George Dorsey, M.D.
James Garvey, M.D.
William Goodchild, M.D.
Charles Haberle, M.D.
Glenn Lewis, M.D.
Carl Malmquist, M.D., M.S.
Donald Mayberg, M.D.
John Mulvahill, M.D.
Ilgvars Nagobads, M.D.
Martin Orbuch, M.D.
Jennings Peteler, M.D.
Stanley Shapiro, M.D.

REQUIRED COURSES

- 103. Clinical Clerkship in Psychiatry and Neurology. (12 cr; prereq regis med)
- 120f,s. Basic Behavioral Science. (3 cr; prereq regis med fr)
- 121s. Behavior Pathology and Psychiatric Methods. (4 cr; prereq regis med soph)
- 122. Clinical Lectures in Psychiatry. (1 cr)

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
- 267. Social 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.
 Royal C. Gray, M.D., Ph.D.

Clinical Professor

Zondal R. Miller, M.D.
 Harold H. Noran, M.D., Ph.D.

Associate Professor

James Berry, Ph.D.
 Harold Cohen, Ph.D.
 John Logothetis, M.D., 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.
Sidney K. Shapiro, M.D.

Assistant Professor

Michael Blaw, M.D.
William Bradley, M.D.
Milton Ettinger, M.D.
George Flora, M.D.
Edward Jimenez-Pabon, M.D.
Sping Lin, Ph.D.
James Moriarty, M.D.
Erland R. Nelson, M.D., Ph.D.
Gilbert Ross, M.D.
Emanuel Stadlan, M.D.
Joo Ho Sung, M.D.
Kenneth Swaiman, M.D.
Francis Wright, M.D.

Clinical Assistant Professor

Harold Berris, M.D.
William Chalgren, M.D., Ph.D.
Paul Elwood, M.D.
Ernest M. Hammes, Jr., M.D.
Andrew J. Leemhuis, M.D.
Robert Stoltz, M.D.
V. Richard Zarling, M.D.

Instructor

Milton Alter, M.D.
Philip Calanchini, M.D.
Anna Ellington, M.D.
Hsien-Hwa-Hsieh, M.D.
G. Aurebeck Lindseth, M.D.

Clinical Instructor

Cecil Baker, M.D.
Lawrence Farber, M.D.
Maland Hurr, M.D.

REQUIRED COURSES

- 101. **Clinical Neurology.** Systematic clinics, demonstrations, and lectures. (4 cr; prereq regis med or grad clinical psychology)
- 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
- 229. Behavior Assessment of the Neurological Patient
- 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.
 Harold Gilberstadt, Ph.D.
 Gordon T. Heistad, Ph.D.
 David T. Lykken, Ph.D.
 Manfred J. Meier, Ph.D.

Assistant Professor

John P. Brantner, Ph.D.
 Thomas Kiresuk, Ph.D.
 Robert Knights, Ph.D.
 Jerome Pauker, Ph.D.
 Lloyd Sines, Ph.D.
 Edward Sulzer, Ph.D.

Auke Tellegen, Ph.D.
 Travis Thompson, Ph.D.
 Daniel Wiener, Ph.D.

Clinical Assistant Professor

Gayle K. Lumry, Ph.D.
 Guy Miles, Ph.D.
 Murray K. Reed, Ph.D.
 Jon Weinberg, Ph.D.

Instructor

Edward M. Ells, Ph.D.
 Seymour Gross, B.A.
 Harold Ireton, Ph.D.
 James Kincannon, B.S.
 Mary Lou Maxwell, Ph.D.
 Naomi Quevillon, Ph.D.
 Zigfrids Stelmachers, Ph.D.
 Donald Stieper, Ph.D.

Clinical Instructor

Baldev Luther, M.A.

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

A. Jack Hafner, Ph.D.
James Lawton, Jr., M.D.
Wentworth Quast, Ph.D.

Clinical Assistant Professor

Richard Bartman, Ph.D.
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.
Francisco Grande, M.D.
Ansel Keys, Ph.D.
George S. Michaelsen, M.S.
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., M.P.H.

Associate Professor

Harry Foreman, M.D., Ph.D.
Harold J. Paulus, Ph.D.

Assistant Professor

Gustave L. Scheffler, B.S.C.E.
Marion W. Thornton, M.A., Ph.D.
Ralph O. Wollan, M.P.H.

Lecturer

Lloyd F. Detwiller, M.H.A.

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)

142s. **Medical Economics.** Economic problems of medical and hospital care for community; programs for medical care and health and hospital insurance. (2 cr)

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)
 191. Science of Human Nutrition. (Cr ar; prereq regis med)
 195. Public Health Aspects of Cardiovascular Disease. (Cr ar; prereq regis med)
 200. Research

Radiology (Rad)

Harold O. Peterson, Professor and Head

Professor

Harold O. Peterson, M.D.
 G. J. D'Angio, M.D.

Clinical Professor

J. Richards Aurelius, M.D.
 Samuel B. Fineberg, M.D.
 Oscar Lipschultz, M.D.
 Donn G. Mosser, M.D., M.S.

Associate Professor

Joseph Jorgens, M.D., Ph.D.
 Kurt Amplatz, M.D.

Clinical Associate Professor

Daniel L. Fink, M.D.
 John P. Medelman, M.D.

Assistant Professor

K. K. N. Charyulu, M.D.
 Eugene Gedgaudas, M.D.
 Baruch S. Jacobson, Ph.D.
 Leonard Langer, Jr., M.D.
 Merle Loken, M.D., Ph.D.
 Yosh Maruyama, M.D.

Clinical Assistant Professor

Osmond J. Baggenstoss, M.D.
 Solveig M. Bergh, M.D.
 Chauncey N. Borman, M.D.
 Lewis S. Carey, 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

Carroll N. Hess, M.D.
 Charles Hewel, M.D.
 J. Paul Leonard, M.D.
 Shih Hao Tsai, 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.
 Robert R. Foley, M.D.
 Charles Wallace Frye, M.D.
 Marvin Goldberg, M.D.
 Bernard Hall, M.D.
 Jule J. Hopperstad, M.D.
 Richard S. Johnson, M.D.
 Thomas Errol Johnson, M.D.
 Robert Kasper, M.D.
 Warren L. Kump, M.D.
 Andrew R. Lillie, 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. Rholl, 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)

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.

- Richard C. Lillehei, 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 Professor

- Orwood J. Campbell, M.D., Ph.D.
- Tague C. Chisholm, M.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.

Clinical Associate Professor

- George S. Bergh, M.D., Ph.D.
- Davitt A. Felder, M.D., Ph.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 M. Owens, Jr., M.D.
- Carl O. Rice, M.D., M.S.

Associate Professor

- Joe Bradley Aust, M.D., Ph.D.
- Edward W. Humphrey, M.D., Ph.D.

Assistant Professor

- Karel B. Absolon, M.D., Ph.D.
- Victor A. Gilbertsen, M.D., M.S.

Theodor Grage, M.D., Ph.D.
 Ward O. Griffen, Jr., M.D., Ph.D.
 Harlan D. Root, M.D., Ph.D.
 Peter A. Salmon, 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.
 Joseph J. Garamella, M.D., Ph.D.
 David Gavisser, M.D., M.S.
 John K. Grotting, M.D., M.S.
 William F. Hartfel, M.D.
 Laurence D. Hilger, M.D.
 Samuel Hunter, M.D., M.S.
 Frank E. Johnson, M.D.
 Esten O. Lindseth, M.D., Ph.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.
 Abbot Skinner, M.D., M.S.
 Vernon D. Smith, M.D.
 Bernard J. Spencer, M.D.
 Jacob H. Strickler, M.D., M.S.
 Lyle A. Tongen, M.D., M.S.
 Robert W. Utendorfer, M.D., M.S.
 Earl G. Yonehiro, M.D., Ph.D.

Instructor

Eugene F. Bernstein, M.D.
 Aldo Castaneda, M.D.
 John D. Condie, M.D.
 Henry Gans, M.D.
 Bernard Goott, M.D.
 John Haglin, M.D.
 Arnold Leonard, M.D.
 Morris Levy, M.D.
 John Lunseth, M.D.
 Theodore A. Peterson, M.D.

Stephen R. Richards, M.D.
 Neil M. Trotman, M.D.

Clinical Instructor

John F. Alden, M.D., M.S.
 Frank J. Ankner, M.D.
 Manuel R. Binder, M.D.
 Norman B. Bloom, 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.
 Jerome T. Grismer, M.D.
 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.
 John H. Linner, M.D.
 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.
 Jack I. Schneck, M.D.
 Horace G. Scott, M.D., M.S.
 Joseph L. Sprafka, M.D.
 William E. Stephens, M.D.
 John E. Twomey, M.D.
 Richard J. Webber, M.D.
 George Werner, M.D.
 Darrell E. Westover, M.D.

Clinical Assistants

Edwin G. Benjamin, M.D.
 Harold C. Benjamin, M.D.
 Frank J. Bonello, M.D.
 Robert P. Caron, M.D.
 Lyle V. Kragh, 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, asepis, homeostasis, 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.

Assistant Professor

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

J. L. Story, M.D.

Clinical Assistant Professor

Paul S. Blake, M.D.

Robert L. Merrick, M.D.

Leonard A. Titrud, M.D., Ph.D.

Clinical Instructor

Michael P. Sperl, 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

- 300. 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

Professor

John H. Moe, M.D.

Clinical Professor

Edward T. Evans, M.D.
Harry B. Hall, M.D.
Malvin J. Nydahl, M.D.

Clinical Associate Professor

Walter Indeck, M.D.
Richard H. Jones, M.D.

Clinical Assistant Professor

Frank S. Babb, M.D., M.S.
Lester W. Carlander, 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 E. Reiley, M.D.
Frederick G. Rosendahl, M.D.

Instructor

Ramon B. Gustilo, M.D.
William Kane, M.D.
Robert F. Premer, M.D.

Clinical Instructor

Paul M. Arnesen, M.D.
Robert M. Barnett, M.D.
John J. Beer, M.D.
Frederick E. Drill, M.D.
Evan S. Ellison, M.D.
Paul H. Gislason, 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.
Donald C. Meredith, M.D.
George E. Nelson, Jr., M.D., M.S.
Roland F. Neumann, M.D.
Irwin F. Schaffhausen, M.D.
Ivan Schloff, M.D.
Wayne Thompson, M.D.

REQUIRED COURSES

122. Principles of Diagnosis, Treatment, Prognosis of Fractures, Dislocations. (1 cr; prereq regis med jr)
140. Clinical Lectures in Orthopedic Surgery. (1 cr; prereq regis med sr)

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
407. Pediatric Orthopedics
408. Orthopedic Service
410. Orthopedic Pathology
411. Orthopedic Operative Surgery
412. Orthopedic Anatomy
416. Orthopedic Research

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

Stanley M. Goldberg, M.D.

COURSES

For course descriptions, see preceding section on General Surgery.

Division of Urology

Charles D. Creevy, Director

Professor

Charles D. Creevy, M.D., Ph.D.

Edward J. Richardson, M.D.
Richard S. Rodgers, M.D.
Edgar A. Webb, M.D.

Clinical Associate Professor

Samuel S. Beirstein, M.D.
Baxter A. Smith, M.D., M.S.

Instructor

John Pyrris, M.D.

Assistant Professor

Colin Markland, M.D.
George T. Mellinger, M.D.

Clinical Instructor

Robert A. Flynn, M.D.
George L. Garske, M.D.
Robert W. Geist, M.D.
Gerald D. McEllistrem, M.D.
Harold A. Reif, M.D., M.S.
Ragnar T. Soderlind, M.D.
Gordon W. Strom, M.D.
Theodore H. Sweetser, Jr., M.D.

Clinical Assistant Professor

David M. Anderson, M.D.
Bruce Edgar Linderholm, M.D.
Hugo E. Miller, M.D., M.S.
William E. Price, M.D.
Milton P. Reiser, M.D., M.S.

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

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 serves 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—Arndt J. Duvall III, M.D., Director
 Eye Clinic—William Knoblauch, M.D., Director
 Gynecology Clinic—Edgar Makowski, M.D., Director
 Medicine Clinic—James B. Carey, Jr., M.D., Director
 Maynard Jacobson, M.D., Assistant Director
 Graham Beaumont, M.D., Director, Admissions Clinic
 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., Associate Director,
 Director of Child Development Clinic
 Robert ten Bensel, M.D., Assistant Director
 Physical Medicine and Rehabilitation Clinic—Glenn Gullickson, M.D., Director
 Psychiatry Clinic—Richard Anderson, M.D., Director
 Surgery Clinic—Arnold Leonard, M.D., Director
 Tumor Clinic—Joseph Aust, M.D., Director
 Urology Clinic—Donald Creevy, M.D., Director
 Milton Reiser, M.D., Assistant Director
 Public Health—Stewart Thomson, M.D., Professor
 Radiology—Charles Hewel, M.D., Director