The Bulletin of the
UNIVERSITY *of* MINNESOTA

School of Public Health

Announcement for the Years 1948-1950

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UNIVERSITY CALENDAR 1948-49

1948			*Fall Quarter*
August 2 -September 24			Entrance Tests.[1] Fall Registration[2]: Dates for the various colleges will be announced in the press and in mailed instructions. Students who can do so are urged to register early. It is expected that all students who can do so will register before September 1
September	13	Monday	Extension registration, first semester, begins
September	16	Thursday	Fall quarter fees due for students registered through September 10
September	20-24		New student week; program of orientation. Details will be announced in instructions issued at registration. All new students are expected to attend
September	24	Friday	Last day for registration[2] and payment of fees for the undergraduate colleges
September	25	Saturday	Last day for extension registration
September	27	Monday	Fall quarter classes begin 8:00 a.m.[3] First semester extension classes begin[4]
September	30	Thursday	Opening convocation, 11:00 a.m. New students excused from IV hour classes to attend
October	1	Friday	Last day for registration and payment of fees for the Graduate School, and for teachers in service
October	12	Tuesday	Columbus Day; holiday (except extension)
October	30	Saturday	Homecoming Day
November	6	Saturday	Dads Day
November	11	Thursday	Armistice Day; holiday (except extension)
November	18	Thursday	Senate meeting, 3:00 p.m.
November	25	Thursday	Thanksgiving Day; holiday
December 10-11 and 13-16			Final examination period
December	16	Thursday	Commencement, 8:00 p.m.
December	18	Saturday	Fall quarter closes[5]
			Winter Quarter
December	23	Thursday	Winter quarter fees due for students in residence fall quarter in undergraduate colleges
1949			
January	3-4	Monday, Tuesday	Entrance tests.[1] Registration[2] for all new students not already registered. Registration and payment of fees for new students in all undergraduate colleges close
January	4	Tuesday	Winter quarter classes begin 8:00 a.m.[3]
January	7	Friday	Last day for registration and payment of fees for the Graduate School, and for teachers in service
January	24	Monday	Extension registration, second semester begins
February	4	Friday	First semester extension classes close
February	5	Saturday	Last day for extension registration
February	7	Monday	Second semester extension classes begin[4]

February	12	Saturday	Lincoln's Birthday; holiday
February	13-19		University of Minnesota Week
February	17	Thursday	Charter Day. Senate meeting, 3:00 p.m.
February	22	Tuesday	Washington's Birthday; holiday (except extension)
March 11-12 and 14-17			Final examination period
March	17	Thursday	Spring quarter fees due for students in residence winter quarter in undergraduate colleges. Commencement, 8:00 p.m.
March	19	Saturday	Winter quarter closes

Spring Quarter

March	25, 28	Friday, Monday	Entrance tests.[1] Registration[2] for new students not already registered Registration and payment of fees for new students in all undergraduate colleges closes
March	28	Monday	Spring quarter classes begin 8:00 a.m.[3]
April	1	Friday	Last day for registration and payment of fees for the Graduate School, and for teachers in service
April	15	Friday	Good Friday; holiday (except extension)
May	12	Thursday	Cap and Gown Day Convocation, 11:00 a.m. Graduating students excused from IV hour classes to attend
May	14	Saturday	Mothers Day
May	19	Thursday	Senate meeting, 3:00 p.m.
May	30	Monday	Memorial Day; holiday (except extension)
June	3	Friday	Second semester extension classes close
June	5	Sunday	Baccalaureate service, 11:00 a.m.
June 4 and 6-10			Final examination period
June	11	Saturday	Spring quarter closes. Commencement, 8:00 p.m.

Summer Session

June	13, 14	Monday, Tuesday	Registration[2] for new students not already registered. First term fees due for students in all colleges
June	15	Wednesday	First term Summer Session classes begin 8:00 a.m.[3]
July	4	Monday	Independence Day; holiday
July	21	Thursday	Commencement, 8:00 p.m.
July	23	Saturday	First term closes
July	25	Monday	Registration[2] for new students not already registered. Second term fees due for students in all colleges
July	26	Tuesday	Second term classes begin 8:00 a.m.[3]
August	25	Thursday	Commencement, 8:00 p.m.
August	27	Saturday	Second term closes

[1] Applicants are urged to take entrance tests one to two months in advance of the quarter for which admission is desired. Tests may be taken at the Student Counseling Bureau, 101 Eddy Hall.

[2] Registration subsequent to the date specified will necessitate the approval of the college concerned. See privilege fees for late registration or late payment of fees, in *General Information Bulletin* and in *Summer Session Bulletin.*

[3] First hour classes begin at 7:45 a.m. at St. Paul Campus.

[4] This date does not refer to correspondence study courses, which may be started at any time during the year.

[5] Extension classes resume Monday, January 3.

FACULTY

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Margaret S. Taylor, M.A., Director, Course in Public Health Nursing

SCHOOL OF PUBLIC HEALTH

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Robert B. Westphal, B.A., Teaching Assistant
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Dean Conley, Executive Secretary of American College of Hospital Administrators

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L. C. Mortrud, Business Manager, Northwestern Hospital, Minneapolis

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Russell Nye, Director, Northwestern Hospital, Minneapolis

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Jane Peterson, Executive Housekeeper, Ancker Hospital, St. Paul

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D. W. Pollard, M.D., Superintendent, Minneapolis General Hospital

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Earl C. Wolf, Director of Purchases, St. Mary's Hospital, Rochester
Leslie L. Wood, Senior Mechanical Engineer, University of Minnesota

COURSES IN PUBLIC HEALTH AND HYGIENE

General statement—The School of Public Health offers a wide selection of general and professional courses in the field of preventive medicine and public health. The general courses are designed for the student who desires some knowledge of personal health and an understanding of the community program that exists for the promotion of the public health. The professional courses are intended to furnish technical training for those who seek a career in public health work or who wish to use technical knowledge and procedures in their future work in allied fields. Because of their close relationship to public health and hygiene, the biostatistical instruction at the University and the Laboratory of Physiological Hygiene are incorporated as part of the School of Public Health.

Professional training courses in public health—Instruction in preventive medicine and public health has been conducted at the University of Minnesota for more than half a century. In 1922 a separate Department of Preventive Medicine and Public Health was authorized and established by the Board of Regents 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. The course in public health nursing, one of the first in the country, was established in 1918. In 1935 the University of Minnesota was selected by the health officers of the states of this area as the institution to which they desired to send personnel for public health training under the provisions of the Social Security Act. Formal, organized curricula for training of health officers and public health engineers were established at that time. In 1944 the Board of Regents authorized the expansion of the Department of Preventive Medicine and Public Health into a School of Public Health.

The School is accredited by the American Public Health Association for work leading to the degree of master of public health; and the public health nursing course is accredited by the National Organization for Public Health Nursing.

The School of Public Health provides courses for the training of health officers, public health engineers, public health nurses, public health educators, and hospital administrators. Arrangements can also be made for special courses of study for other persons with professional training and public health experience, notably dentists, veterinarians, statisticians, sanitarians, and laboratory personnel.

The School attempts to provide for the public health training of all the professional personnel who are employed in the organized public health program. To this end it accepts physicians, dentists, engineers, nurses, educators, veterinarians and others whose professional background is such as to prepare them for public health work. During the course of study emphasis is placed on the training of a coordinated team of professional workers, each of whom 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 professional courses leading to advanced degrees are required to take basic courses in public health administration, epidemiology, statistics, sanitation, public health nursing and health education. To this nucleus of required courses, which so far as possible all advanced students take together, each of the professional groups adds elective courses from their respective fields of special interest.

The School of Public Health has developed its teaching program in close collaboration with other departments in the medical sciences group and with other departments of the University dealing with collateral fields of knowledge, in particular with engineering, the biological sciences, education, nutrition, and social sciences. The training of personnel for public health service is a part of the special interest of the University in training

individuals for public service. Unusually broad facilities are afforded for acquiring factual material, techniques and points of view which are conducive to an intelligent approach to the problems of the various fields of public health service.

Equally important in this type of education is the opportunity to observe the application of these principles by official and voluntary agencies. To this end, a close working relationship has been developed with the Minnesota State Department of Health and the Minneapolis Health Department. The sections of Departmental Administration, Preventable Diseases, Medical Laboratories, Environmental Sanitation, and Special Services of the former are housed on the Minneapolis Campus. Teaching has been recognized as one of the essential activities of the state and local health departments. The state and city health officers, their division heads, and technical assistants have therefore assumed a responsible and interested part in the instruction of students enrolled in the University. The directing heads and technical assistants of a large number of official and voluntary health organizations in Minnesota, Illinois, Iowa, Kansas, Nebraska, Oklahoma, North and South Dakota, and Wisconsin have also assisted in the effort to give supervised experience in field activities in both urban and rural areas. The city-county health unit at Rochester, Minnesota, has been developed with the assistance of the Kellogg Foundation as a field training area for all types of personnel. With the establishment of a School of Public Health at the University of Minnesota it has been further possible to invite public health personnel from neighboring states and officers of the United States Public Health Service to participate in planning the curriculum and, as guest lecturers, to discuss problems peculiar to their fields of interest.

The rapid expansion in public health work in recent years has created a demand for trained personnel. The University recognizes that adequate training for this field cannot be acquired in a few weeks. There is a general consensus of opinion that the training period should extend over at least one academic year or three university quarters of postgraduate study. As far as possible, those students entering the University for this type of study should, therefore, attempt to devote a year to this training. The arrangement of courses by academic quarters is designed to present a logical sequence of material. In some fields an additional three months of field experience beyond the three academic quarters is required.

Short courses—The University does not offer special short courses in any of the fields of public health but has attempted to group certain fundamental subjects in various quarters so that the student unable to spend the entire year in residence may obtain a suitable program of study. Credits so earned will count toward a degree if the student returns at a later date.

Summer Session—The Summer Session at the University of Minnesota consists of two terms each of 5 to 6 weeks. In each of these terms are concentrated certain courses in preventive medicine and public health that are spread over one or two quarters during the regular year. Altho the offerings for the Summer Session vary somewhat from year to year, they are planned to make available some of the important fundamental courses each year with variation as to the supplemental courses. Visiting lecturers each summer bring new points of view in courses that are not available during the regular year. Special workshops lasting two weeks are offered in certain fields during some of the summer sessions.

In-service training courses—Non-credit, in-service training courses are offered at the University at the Center for Continuation Study through the co-operation of the School of Public Health and the director of postgraduate medical education. These courses vary in length from three days to two weeks and are offered to physicians, engineers, nurses, hospital administrators, educators or other groups within the public health field. The faculty for these in-training courses is recruited from the regular university staff, supplemented by special lecturers.

COURSES FOR MEDICAL HEALTH OFFICERS

Major Adviser: Gaylord W. Anderson.

Requirements for admission—

1. The degree of doctor of medicine from an acceptable institution (i.e., in Class A of the American Medical Association).

2. One year's experience as an intern in an approved hospital, or an acceptable substitute.

Application blanks for admission will be supplied by the School of Public Health upon request. They should be filed with the School at least two weeks before reporting for registration and should be accompanied by a statement of experience and training. A letter from the registrar of the college of graduation, *certifying to the professional degree and an official transcript of the applicant's college record,* must also accompany the application.

PLAN OF INSTRUCTION

The course of study leading to the degree of master of public health covers a minimum of three academic quarters. These quarters may be taken in a single academic year or divided among two or more years according to the preference of the student. In all cases the student should plan to begin in a fall quarter. The following program of courses is suggested. (See page 26 for description of courses.)

Recommended Courses

No.	Title	Credits
P.H. 102*	Environmental Sanitation I	3
P.H. 104*	Epidemiology I	3
P.H. 105	Epidemiology II	3
P.H. 106*	Public Health Administration	3
P.H. 107	Child and Adult Hygiene	3
P.H. 122	Public Health Administration Problems	3
P.H. 124	Environmental Sanitation II	2
P.H. 125*	The Community Health Education Program	3
P.H. 126	Industrial Health Problems	3
P.H. 133	Mental Hygiene	3
P.H. 140*	Vital Statistics	3
P.H. 141	Economic and Social Aspects of Medical Care	3
P.H. 153	The Hospital and the Community	1
P.H. 170*†	Supervision in Public Health Nursing	3
P.H. 210	Seminar in Preventive Medicine and Public Health	1
Bact. 124	Filterable Viruses	4
Med. 205	Tuberculosis	2
Ped. 158	Contagious Diseases	1
Pol.Sci. 120	Municipal Functions	3
Pol.Sci. 121	Municipal Administration	3

Elective Courses

P.H. 108	Care of the Handicapped Child	2
P.H. 110	Biometric Principles	3
P.H. 111	Biostatistics Laboratory	2
P.H. 117	Sanitary Biology	Ar
Bact. 101, 102	Medical Bacteriology	5
Bact. 116	Immunity	3
Bact. 120	Diseases of Animals Transmissible to Man	3
C.W. 130-131	Child Development	6
Ed.C.I. 114	The School Health Education Program	3

* Required course.

† P.H. 171 may be substituted for P.H. 170.

No.	Title	Credits
Ed.C.I. 217	Seminar in the School Health Education Program	Ar
Med. 269	Syphilis Therapy	2
Pol.Sci. 122	Municipal Problems	3
Zool. 144-145-146	Animal Parasites and Parasitism	9

Requirements for degrees—See page 23.

COURSES FOR PUBLIC HEALTH ENGINEERS

Major Advisers: Harold A. Whittaker and George O. Pierce.

Requirements for admission—Entrance upon work for which credit may be applied toward the degree of master of public health or master of science with a major in public health engineering is limited to those who have (a) an engineering degree, preferably with a major in sanitary, civil, or chemical engineering, or (b) a university degree with adequate training in the basic and applied sciences, including bacteriology.

Application blanks will be supplied upon request to the School of Public Health. They should be filed with the School at least two weeks before reporting for registration and should be accompanied by a statement of experience and training. A statement from the registrar of the college of graduation, *certifying to the professional degree, and an official transcript of the applicant's college record,* must accompany the application. Applicants who are deficient in any of the above requirements but who are otherwise acceptable, may register as special students for such courses as may be available in the desired subjects. The School of Public Health will advise applicants and assist them in registering in such courses.

PLAN OF INSTRUCTION

The course of instruction leading to the Master's degree covers a minimum of three quarters of study. These quarters may be taken in a single academic year or divided among two or more years according to the preference of the student, but in all cases the student should plan to begin his studies in the fall quarter.

The program of study to be followed should include such courses as will supplement the engineer's previous education and experience in order that he may acquire a training in all phases of environmental sanitation and in other important branches of public health work. The program therefore includes courses dealing with water, milk, and food sanitation; sewage, excreta, and waste disposal; air hygiene; occupational hygiene; control of animals and insects involved in the spread of disease; sanitation of building and recreational areas; public health administration; epidemiology; public health nursing; biometry; and health education.

The following program of courses is suggested (see page 26 for description of courses):

Required Courses

No.	Title	Credits
P.H. 102	Environmental Sanitation I	3
P.H. 104*	Epidemiology I	3
P.H. 106	Public Health Administration	3
P.H. 110¶	Biometric Principles	3
P.H. 111¶	Biostatistics Laboratory	2
P.H. 112	Water Supply Sanitation	4
P.H. 113	Sewage, Excreta, and Waste Disposal	4
P.H. 115	Food Sanitation	3
P.H. 116	Public Health Engineering Administration	2
P.H. 125	The Community Health Education Program	3
P.H. 152	Industrial Hygiene Engineering	3
P.H. 171*	Problems in Public Health Nursing	3

* P.H. 100 may be substituted for P.H. 104 and P.H. 170 for 171 in case of M.P.H. degree candidate.

¶ P.H. 140 may be substituted for P.H. 110 and 111.

Recommended Electives

No.	Title	Credits
P.H. 105	Epidemiology II	3
P.H. 117-118	Sanitary Biology	4
P.H. 126	Industrial Health Problems	3

Other Electives

P.H. 120	Correlation Analysis	3
P.H. 121	Correlation Analysis Laboratory	2
P.H. 130	Statistical Inference	3
P.H. 131	Sampling Laboratory	2
Anal.Chem. 140	Water Analysis	3
Arch. 104	City Planning	3
Bact. 53§	General Bacteriology	(5)
Bact. 120	Diseases of Animals Transmissible to Man	3
Bact. 123	Applied Bacteriology	3
C.E. 161	Hydrology	4
C.E. 162	Water Supply	3
C.E. 163	Sewerage	3
C.E. 173	Sanitary Engineering Problems (Water)	3
C.E. 174	Sanitary Engineering Problems (Sewage and Industrial Wastes)	3
C.E. 175	Industrial Waste Disposal	3
C.E. 179	Sanitary Laboratory	3
Ch.E. 131	Inorganic Industrial Chemistry	3
Ch.E. 132	Organic Industrial Chemistry	3
Ch.E. 140	Sanitary Chemistry	3
D.H. 51§	Market Milk	(3)
D.H. 102	Dairy Bacteriology	3
M.E. 160	Heating, Ventilating, and Air Conditioning	3
M.E. 165	Advanced Heating, Ventilating, and Air Conditioning	3
M.E. 167	Advanced Heating, Ventilating, and Air Conditioning	3
M.E. 169	Heating, Ventilating, and Air Conditioning Laboratory	2
Pol.Sci. 120	Municipal Functions	3
Pol.Sci. 121	Municipal Administration	3
Soc. 161	Social Aspects of Housing and Standards of Living	3

Requirements for degrees—See page 23.

COURSES FOR PUBLIC HEALTH NURSES

Major Adviser: Margaret S. Taylor.

Courses for public health nurses are designed to meet the needs of the following students:

(a) Those who have been graduated from a school of nursing which does not grant an academic degree at the completion of the course. These students are admitted with advanced standing as candidates for the bachelor of science degree.

(b) Students who have been graduated from a school of nursing and completed the work for a baccalaureate degree, with a major in some field other than public health nursing. Such students are admitted as candidates for a certificate in public health nursing.

(c) Students who have completed the work for a baccalaureate degree, with a major in public health nursing, or its equivalent, and who have had suitable professional experience to qualify them for advanced work in their professional field. These students may enroll for either the master of science or the master of public health degree.

(d) Students who are completing a five-year degree course in nursing, with a major in public health nursing. Such students are admitted through an affiliation agreement with the School of Nursing as candidates for the certificate, or under certain conditions as transfer students and candidates for the bachelor of science degree.

§ No graduate credit allowed for this course.

Students may enroll in the School of Public Health or under certain conditions jointly in the School of Public Health and the College of Education; candidates for the master of science degree register in the Graduate School.

REQUIREMENTS FOR ADMISSION

1. Candidates for the bachelor of science degree

(a) Ability to meet regular entrance requirements of the University. Occasionally students who are not eligible for matriculation at the University may be accepted as "special students" upon approval of the public health nursing committee. When admission is granted on this basis, the student is *not eligible for a degree or certificate* until her entrance status has been satisfactorily adjusted. If unable to present approved high school credentials, the student must demonstrate ability to carry university work through satisfactory completion of entrance examinations. Students who plan to take entrance examinations should come to the University four days in advance of the date set for registration. (See *Bulletin of General Information,* which may be obtained from the dean of admissions and records.)

(b) Graduation from an accredited school of nursing offering a satisfactory theoretical and clinical experience.

(c) Approval by the public health nursing committee.

Advanced standing for those transferring from other schools of nursing will be determined upon review of the nursing records of the applicant. A maximum of 60 credits may be allowed, but there is some variation depending upon the amount and type of preparation afforded by the school of nursing attended. If essential services have been inadequate in the basic nursing program of the student, she may be required to complete additional hospital service before advanced standing will be granted, tho not necessarily before admission to the course.

Field observation or experience is a prerequisite for the course in public health nursing. The student should, where possible, arrange for at least a week of observation in a public health agency in her own community. If this is not possible the University will arrange for this observation prior to registration. Requests for such observation should be sent to the director of the Course in Public Health Nursing, University of Minnesota, at least two months in advance.

2. Candidates for a certificate in public health nursing

(a) Baccalaureate degree.

(b) Courses in bacteriology, psychology, and sociology. Admission without these courses may be approved subject to their completion before awarding of the certificate. They may not, however, be substituted for the required courses.

(c) Basic nursing education as described in 1(b).

3. Candidates for the master of science degree

Candidates for the master of science degree must meet the regular requirements of the Graduate School as described in the bulletin of that school. They must have:

(a) Baccalaureate degree.

(b) Major sequence in public health nursing, certificate in public health nursing, or equivalent.

(c) Suitable professional experience and personal qualifications.

4. Candidates for the master of public health degree

(a) Baccalaureate degree.

(b) Major sequence in public health nursing, certificate in public health nursing, or equivalent.

(c) Suitable professional experience and personal qualifications. (See page 23.)

PLAN OF INSTRUCTION

1. Undergraduate program

Students may attend the University for the entire period necessary to secure a degree or may attend for as short a time as a single quarter. In general, it is advisable to plan for at least two quarters of work, since this lends a greater amount of continuity. Students who plan to remain at the University for a period longer than one year are urged to register for general academic subjects in advance of their professional courses.

Those entering during the fall quarter, even though admitted with advanced standing, are eligible to take advantage of New Students' Week activities. The *New Students' Handbook* may be secured from the dean 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."

Field work is an essential part of the program. Supervised practice in a family health agency, urban and rural, and in school services is required for either the degree or certificate in public health nursing. Opportunities to participate in closely supervised field experience have been arranged through collaboration with the state departments of health of Illinois, Iowa, Kansas, Minnesota, North and South Dakota, Oklahoma, and Wisconsin; the city health departments of Minneapolis and Rochester, Minnesota; the Minneapolis Community Health Service; the Public Health Nursing Association of Des Moines, Iowa; Visiting Nurse Service, Cedar Rapids, Iowa; the St. Paul Family Nursing Service; and the Visiting Nurse Association of Omaha, Nebraska.

Application for field experience should be made at least three months before the period when it is desired. More valuable rural experience is available for those who can provide their own cars.

Students are required to furnish their own uniforms, transportation to and from the field, and board and lodging during this experience. With the exception of field work in supervision, students are expected to devote full time to field work, and may *not carry* other university courses concurrently.

Required Courses

No.	Title	Credits
English		9–15
	(The required course will depend upon the results of the English Placement test which must be taken before the date of registration.)	
Social Sciences		
Soc. 1	Introduction to Sociology	5
Soc. 49	Social Pathology	3
Soc. 50	Areas of Social Work	4
or		
Soc. 91	Case Methods Applied to Study of Human Problems	3
	Electives in child welfare group	3
	Elective in political science	3
	Electives in history, political science, economics	6
		23–24
Natural Sciences		
Psy. 1-2	General Psychology	6
Bact. 53 or 101	General Bacteriology or Medical Bacteriology	5
	Courses from natural sciences (chem., zool., etc.)	14
		25

No.	Title	Credits
Professional Courses		
P.H. 62-63	Principles of Public Health Nursing	6
P.H. 65 P.H. 66 P.H. 67	Field Work in School Nursing Field Work in Rural Nursing Field Work in Urban Nursing	15–23*
P.H. 100	Elements of Preventive Medicine and Public Health	5
P.H. 133	Mental Hygiene	3
Ed. 81	Introduction to Education for Public Health Nurses	3
	Electives from School of Public Health	5
	Free electives from any department	29–43
		71–78
		135
	Advanced standing for three years of hospital training approximately	45
		180

The curriculum in the College of Education leading to a bachelor of science degree with a major in public health nursing differs from the above curriculum only in that 26 credits in education are required, and this leaves 0-15 credits for electives.

2. Certificate program

The certificate program extends over a period of three to three and one-half quarters. The student who enrolls for the certificate course without having had either basic science courses or suitable experience in public health nursing may need to spend three and one-half quarters at the University in order to complete the necessary requirements.

Required Courses

No.	Title	Credits
P.H. 62-63	Principles of Public Health Nursing	6
P.H. 65 P.H. 66 P.H. 67	Field Work in School Nursing Field Work in Rural Nursing Field Work in Urban Nursing	15–23*
P.H. 100	Elements of Preventive Medicine and Public Health	5
P.H. 133	Mental Hygiene	3
Ed. 81	Introduction to Education for Public Health Nurses	3
Soc. 50 or Soc. 91	Areas of Social Work Case Methods Applied to Study of Human Problems	4 3
	Electives from School of Public Health	3
	Electives from related departments to make a total of at least 45 credits.	

3. Graduate program

The graduate program ordinarily extends over a minimum of three quarters.

Students enrolled for the master of public health or master of science degree are expected to take certain courses which are designed to familiarize them with the problems of professional groups with whom they will work in the public health field.

Public health and mental hygiene sequence requires a minimum of five quarters. Course sequence obtainable on request.

Required Courses

No.	Title	Credits
P.H. 102	Environmental Sanitation I	3
P.H. 104	Epidemiology I	3
P.H. 106	Public Health Administration	3
P.H. 125	The Community Health Education Program	3

* Exemption from part of this requirement may be given for satisfactory prior experience of six months or more received in an approved agency offering suitable supervision.

No.	Title	Credits
P.H. 140	Vital Statistics	3
P.H. 170	Supervision in Public Health Nursing	3
P.H. 171	Problems in Public Health Nursing	3

Required courses have been reduced to the minimum to facilitate individual planning for each student. Courses offered in other schools and colleges of the University are freely available to qualified students, and offer an almost unlimited range of possibilities for supplementary courses. It is possible to secure a concentration of work in a related field, such as child welfare, social case work, health education, or nutrition where it seems desirable to do so.

COURSES FOR HEALTH EDUCATORS

Major Adviser: Ruth E. Grout.

In the rapidly growing field of health education there is urgent need for professionally prepared personnel. An increasing number of health departments are adding health educators to their staffs, and schools and other agencies are demanding competent health education leadership. As a contribution toward meeting these field demands, the University of Minnesota offers a graduate curriculum in health education for qualified candidates.

The program of study now available in the School of Public Health may lead to the degree of master of public health, master of science, or the doctor of philosophy.†

REQUIREMENTS FOR ADMISSION

1. A Bachelor's degree from an acceptable institution. (Qualified students who have not received the Bachelor's degree and are not candidates for the Master's degree may be admitted as special students.)
2. Evidence of a satisfactory background in (a) the basic health sciences including bacteriology, nutrition, personal health and human physiology; (b) education and educational psychology; and (c) the social sciences including political science and sociology.
3. Personality qualifications essential for satisfactory leadership in health education.
4. For additional requirements for candidates for the master of public health degree see page 24.

PLAN OF INSTRUCTION

The course of study leading to the Master's degree covers at least three academic quarters. One additional quarter of field work in an approved training center will be expected of all students. These quarters may be taken in a single academic year or divided among two or more years according to the preference of the student.

Required

No.	Title	Credits
P.H. 102	Environmental Sanitation I	3
P.H. 104	Epidemiology	3
P.H. 106	Public Health Administration	3
P.H. 125	The Community Health Education Program	3
P.H. 140	Vital Statistics	3
P.H. 171	Problems in Public Health Nursing	3
P.H. 190	Field Work in the Community Health Education Program	Ar.
P.H. 227	Problems in the Community Health Education Program	Ar.
Ed.C.I. 114	The School Health Education Program	3
Ed.C.I. 217	Seminar in the School Health Education Program	Ar.
Jour. 150	Public Relations in Community Service	2
	Electives in Education	6

† The program of study in the College of Education may lead to the degree of master of arts or doctor of philosophy.

Recommended Electives

No.	Title	Credits
P.H. 100	Preventive Medicine and Public Health	5
P.H. 126	Industrial Health Problems	3
P.H. 210	Seminar in Public Health	1
Bact. 101-102	Bacteriology	5-9
C.W. 131	Child Welfare	3
C.W. 170	Parent Education	3
Ed.Ad. 124	Public School Administration	3
Ed.C.I. 104	Adult Education	2
Ed.C.I. 105	Visual Aids in Teaching	2
Ed.C.I. 129	Principles and Problems of Teaching Social Hygiene	3
Ed.C.I. 150	Supervision and Improvement of Instruction	3
Ed.C.I. 170	Curriculum and Course of Study Construction	3
Ed.Psy. 133	Guidance in Secondary Schools	2
Ed.Psy. 159	Personality Adjustments in Education	3
H.Ed. 180	The School and the Social Order	3
Phys.Ed. 115	Philosophy and Current Problems of Physical Education	2
Pol.Sci. 120	Municipal Functions	3
Pol.Sci. 121	Municipal Administration	3
Jour. 130-131	Communication Agencies and Public Opinion	6
Soc. 114	Rural Social Institutions	3
Soc. 282	Principles of Group Work	3

Requirements for degrees—See page 23.

COURSES FOR HOSPITAL ADMINISTRATORS

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

Hospitals as a group today constitute one of the major American business enterprises. The growing importance of the hospital as the natural center of the health resources in the community will tend to increase the number and scope of hospitals.

The tremendously increased utilization of hospitals and the innate complexity of their organization has made the administration of hospitals a very complex and specialized responsibility. The demand for competent and experienced hospital administrators far exceeds the supply nor is there any likelihood that the supply will be adequate for many years, especially in view of the increased demand occasioned by local, state and federal programs for additional hospital construction.

Requirements for admission—Entrance upon work for which credit may be applied toward the degree of master of hospital administration is limited to those who have a degree equivalent at least to the baccalaureate level from an approved educational institution. Evidence of personal capability and fitness for work in the hospital field is likewise considered in each case and will be regarded as an essential for admission. Only full-time students will be accepted as candidates for the Master's degree. No credit that would shorten the academic year of residence will be given for previous experience or instruction. In certain instances special students may be admitted. Elements and principles of accounting is required for admission to the course. For students who do not have this preparation it is possible to take the subject at the University of Minnesota or at some other recognized university or college during the summer quarter or by a correspondence course prior to admission.

It is realized that students applying for admission will present varying backgrounds and the course has been designed with this fact in mind. Students may be Doctors of Medicine, graduate registered nurses, business administration graduates, Doctors of Theology, members of religious orders, graduates of specialized professions within the health and welfare field, and others with special interests and aptitudes for hospital administration.

All communications should be addressed to the Director of the Course in Hospital Administration, School of Public Health, University of Minnesota, Minneapolis 14, Minnesota. Application blanks for admission will be supplied upon request. When filed each application should be accompanied by a certified transcript of the applicant's college record, a letter indicating the applicant's previous work experience as well as reasons for selecting the hospital administration field, and a recent picture of the applicant. Three names of references (such references should be individuals who are connected with the health and medical field) should also be submitted.

PLAN OF INSTRUCTION

The course of instruction leading to the Master's degree is of approximately twenty-one months' duration, including one academic year of three quarters in fulltime residence, and one calendar year of supervised administrative residency. The residency is under university supervision and the school guides the student but does not assume responsibility for finding the residency. During the residency the student is expected to prepare a formal report on a suitable topic for review and acceptance. All students are expected to complete fifty-nine credit hours and to maintain an average of not less than 1.5 based on A = 3, B = 2, and C = 1. The curriculum draws upon other university facilities and upon the facilities provided by the hospitals within the region adjacent to the University. The course of study is so organized as to provide a central group of subjects pertaining directly to hospital administration, with supplementary instruction in its several related fields including public health, medical care and business administration.

The following program of courses will be followed (see page 26 for description of courses):

First Year

No.	Title	Credits
P.H. 100	Elements of Preventive Medicine and Public Health	5
P.H. 102	Environmental Sanitation	3
P.H. 106	Public Health Administration	3
P.H. 125	The Community Health Education Program	3
P.H. 140	Vital Statistics	3
P.H. 141	Social and Economic Aspects of Medical Care	3
P.H. 161	History and Development of Hospitals	5
P.H. 162	Principles, Organization, and Management of Hospitals	5
P.H. 163	Principles, Organization, and Management of Hospitals	5
P.H. 164	Principles, Organization, and Management of Hospitals	5
P.H. 165	Hospitals in Community Organization	1
P.H. 166	Hospital Clerkship	1
P.H. 167	Management Problems in Hospital Administration	4
P.H. 168	Orientation to Medical Sciences	1
B.A. 167	Introduction to Industrial Relations	3

Second Year

P.H. 169‡	Administrative Residency	9

LABORATORY OF PHYSIOLOGICAL HYGIENE

Major Adviser: Ancel Keys.

The Laboratory of Physiological Hygiene, established at the University in 1937 as a research and teaching unit, was made a Division of the School of Public Health effective July 1, 1946. The Laboratory offers unusual opportunities for advanced study in the fields of fatigue, nutrition, physiology of exercise, developmental physiology and biochemistry,

‡ A fee of $100 is charged for this course.

psychosomatics, performance, and problems of metabolism. Facilities and personnel are specialized for experimental studies on man. Programs of study are available which may lead to the degree of master of science or doctor of philosophy.

REQUIREMENTS FOR ADMISSION

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

PLAN AND PROGRAM OF STUDY

The course of study leading to the Master's degree covers at least three academic quarters but in most cases should be planned to cover at least a full calendar year. A large part of two or more quarters will ordinarily be required for thesis work.

Candidates for the Doctor's degree must spend at least three years of graduate study, two years of which must be spent in residence at the University of Minnesota. For these purposes three academic quarters are to be considered as one "year."

The actual program will be adjusted to the individual needs of the student but will be arranged in one of three directions of emphasis: physiological, biochemical or psychological. In general, the following courses, or their equivalents, will be required for the Master's degree:

No.	Title	Credits
P.H. 100	Elements of Preventive Medicine	5
P.H. 110	Biometric Principles	3
P.H. 111	Biometry Laboratory	2
P.H. 191	Human Nutrition	3
P.H. 202, 204, 206, or 208	Seminar	2
P.H. 220	Readings in Physiological Hygiene	2
P.H. 290	Research in Physiological Hygiene	6
Physiol. 103	Physiology	9
Psy.	Graduate level courses	6
	Physiological Chemistry or Agricultural Chemistry, Graduate level courses	7

COURSES FOR VITAL STATISTICIANS

Major Advisers: Alan E. Treloar and Marian W. Thornton.

Requirements for admission—Candidates will be received in the School of Public Health for the degree of master of public health and in the Graduate School for the degrees of master of science or doctor of philosophy with a major in statistics or biostatistics. Candidates must present satisfactory evidences of (a) high aptitude for quantitative reasoning and (b) a broad training in natural science, particularly its biological divisions. Training in mathematics through elementary calculus is desirable but not essential. For additional requirements for the master of public health degree see page 24; the *Bulletin of the Graduate School* should be consulted by those interested in other degrees.

Application blanks will be supplied upon request to the School of Public Health or the Graduate School, respectively. A certified transcript of the applicant's college record must be submitted, also a letter setting forth his past experience and future objectives as they bear on the desired training. Applicants for degree candidacy who are deficient in any of the formal requirements but are otherwise acceptable may register as special students for such courses of training as are desired and approved.

PLAN OF INSTRUCTION

A minimum of three quarters of study in residence is required for the master of public health degree. This period must ordinarily be the fall, winter, and spring sequence of the regular academic year. Study beyond that embraced in this residence period may be required to meet any deficiencies. For degrees in the Graduate School, see the *Bulletin of the Graduate School.*

Basic courses in each of the divisions of the School of Public Health will be required as for other master of public health candidates. (See page 24.) These will be supplemented by courses given currently in the Biostatistics Division, and such other courses offered by departments of the University as may seem best suited to give a well balanced background for work in public health statistics.

The following courses are suggested as a basis of first selection:

Required Courses

No.	Title	Credits
P.H. 100	Elements of Preventive Medicine and Public Health	5
P.H. 102	Environmental Sanitation	3
P.H. 106	Public Health Administration	3
P.H. 110	Biometric Principles	3
P.H. 111	Biometry Laboratory	2
P.H. 120	Correlation Analysis	3
P.H. 121	Correlation Laboratory	2
P.H. 125	The Community Health Education Program	3
P.H. 130	Random Sampling	3
P.H. 131	Sampling Laboratory	2
P.H. 140	Vital Statistics	3

Recommended Courses

P.H. 104	Epidemiology	3
P.H. 105	Epidemiology	3
P.H. 141	Social and Economic Aspects of Medical Care	3
P.H. 150	Life Tables	3
P.H. 210	Seminar in Public Health	Ar
P.H. 211	Seminar in Biometry	1
Pol.Sci. 120	Municipal Functions	3
Pol.Sci. 121	Municipal Administration	3
Math. 121-122-123	Mathematical Theory of Statistics	15
Jour. 150	Public Relations in Community Services	3
Draw. 41§	Technical Drawing	2
B.A. 91§	Tabulating Equipment Laboratory	1

DEGREES AND CERTIFICATES

The emphasis of the instructional program in the School of Public Health is directed primarily toward postgraduate professional study. The professional training courses in public health lead to degrees of bachelor of science, master of science or master of public health or master of hospital administration and doctor of philosophy. The certificate in public health nursing is offered only to nurses who have already received the baccalaureate degree. The certificate in public health nursing, the degree of master of public health and the degree of master of hospital administration are awarded on joint recommendation of the School of Public Health and the Medical School. The master of science and doctor of philosophy degrees are awarded on recommendation of the Graduate School in accordance with provisions established for the University at large.

§ No graduate credit allowed for this course.

Doctor of philosophy—A program of study and research leading to this degree may be elected with a major in public health, in biostatistics, or in physiological hygiene. Entrance upon work for the doctor of philosophy degree with a major in public health will be limited to those who have already completed a Master's degree in public health or related subjects. A major in biostatistics may be elected by those whose interests lie in statistical theories and their application and do not otherwise include the public health field. Similarly a major in physiological hygiene may be elected by qualified students without regard to other public health courses.

A program of at least three years of study and research, approved by a committee of the Graduate School together with a thesis meeting prescribed standards, is required. A minimum of three quarters must be spent in residence at the University of Minnesota. Limited transfer of credits from other approved institutions will be permitted under specified conditions. The general requirements are set forth fully in the *Bulletin of the Graduate School.*

Master of science—This degree is available under two plans, the one involving a minimum of course work plus preparation of a thesis, and the other embracing more extended course work and the formulation of brief reports in lieu of a thesis. Three quarters of study in residence at the University are required in each case; transfer of not more than nine credits earned at other universities may be permitted but this does not shorten the minimum residence requirements. Major fields and advisers may be selected as in the Ph.D. program. Students may major in public health (concentrating upon one of the component fields), in biostatistics (with or without special reference to other parts of the public health program) or in physiological hygiene. For more detailed information, see the *Bulletin of the Graduate School.*

Master of public health—The student who wishes advanced professional preparation for work in public health is advised to elect the curriculum leading to the degree of master of public health. Registration is in the School of Public Health. The requirements for admission to candidacy for the degree of master of public health are those set by the American Public Health Association as follows:

"Candidates to be admitted for the degree of master of public health may be either

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 training in mathematics and the natural sciences including chemistry and biology; and also qualified in some professional capacity to pursue education in public health.

"The latter qualifications may normally be fulfilled either by

(1) 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

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

A period of supervised field experience in a public health agency is highly desirable before entering upon this program of study.

All candidates for the master of public health degree must complete a program of at least three quarters of approved study in courses at the University of Minnesota. This must include a *minimum* of 45 credits in courses of graduate grade, including public health administration, epidemiology, sanitation, public health nursing, health education, and vital statistics. The program selected must have the approval of the student's adviser, and a grade average of not less than 1.5 (based on: A = 3, B = 2, and C = 1) must be

attained, including a grade average of 1.5 in all public health courses. The student must also successfully pass a comprehensive examination at the end of the period of study. Transfer of not more than nine credits earned at the University may be approved but this does not shorten the minimum residence requirement of three academic quarters.

Certificate in public health nursing—A certificate in public health nursing is awarded simultaneously with the bachelor of science degree to those who complete the prescribed curriculum with a major in public health nursing at the University of Minnesota. Others who have received the baccalaureate degree in any field from an approved institution and who have been graduated with satisfactory theoretical and clinical experience from an accredited school of nursing, may become candidates for the certificate in public health nursing. A total of 45 credits must be earned in approved courses and field work conforming to the curriculum set forth in this bulletin. *Thirty* of the 45 credits for the certificate in public health nursing, including basic courses in theory, must be taken at the University of Minnesota. Candidates for the certificate must have an adequate background in bacteriology, psychology, and sociology. Students who cannot meet these latter requirements may be admitted on condition that they take the necessary courses to remedy this deficiency *in addition* to the prescribed curriculum.

Bachelor of science—The School of Public Health contributes special training curricula for this degree primarily in the field of public health nursing. The degree may also be earned with a major in biostatistics by those who wish to secure preparation for a career in statistical work.

1. *Major in public health nursing*—Students may register for this degree in either the School of Public Health or in the College of Education. The curriculum in the College of Education differs from that in the School of Public Health only in the fact that 26 credits in prescribed education courses must be taken in addition to required professional courses.

A total of 180 credits in approved courses is required; the usual course load is 15 credits per quarter except during hospital training. The student is expected to maintain a satisfactory academic standing while attending the University and may not graduate with less than a C average in all work as well as a C average in the major sequence. For every five honor points in excess of one honor point per credit ($A = 3$, $B = 2$, $C = 1$), the credit hours required for graduation are diminished by one, but the student must complete all the required courses.

At least three quarters in residence are required for the bachelor of science degree; at least two of these quarters must be in the senior year. Courses taken at the University of Minnesota must include basic courses in public health theory. If more than five years have elapsed between the completion of such courses and the earning of the degree the student's program will be re-evaluated to determine the desirability of repetition.

2. *Major in biostatistics*—Registration for courses leading to the bachelor of science degree with a major in biostatistics may be made either in the College of Science, Literature, and the Arts or the College of Education. The curricula are, in general, of a broadly elective type and designed for a normal period of study covering four academic years. An adviser in the major field should be selected, preferably on admission to the University, and certainly not later than the beginning of the junior year. Full details concerning registration and courses will be found in the *Bulletin of General Information* and in the bulletins of the respective colleges.

DESCRIPTION OF COURSES

EXPLANATIONS

Course numbering—A course is designated by a department name, a number, and a letter. It has the same number in whatever quarter it is offered. The quarter is indicated by letter (f, fall; w, winter; s, spring; su, summer).

Examples:

1f-2w, a two-quarter course given in the fall and winter.
1w-2s, the same course given in the winter and spring.
3f,w,s, a one-quarter course given each quarter.

Room schedules will be posted on the Public Health bulletin board in 121 Millard Hall.

ABBREVIATIONS AND SYMBOLS

I, II, III, etc.	Minneapolis Campus, first hour (8:00 to 8:50), second hour (9:00 to 9:50), third hour (10:00 to 10:50), fourth hour (11:00 to 11:50), fifth hour (12:00 to 12:50), sixth hour (1:00 to 1:50), seventh hour (2:00 to 2:50), eighth hour (3:00 to 3:50), ninth hour (4:00 to 4:50), tenth hour (5:00 to 5:50).
Ar.	To be arranged or assigned.
Cred.	Credits.
Lab.	Laboratory.
Lect.	Lecture.
MTWThFS	Monday, Tuesday, etc.
Prereq.	Prerequisite.
Rec.	Recitation.

A parenthetical statement after the title of each course gives the following information: the number of credits the course carries, the classes to whom it is open, and the courses prerequisite to it. *Abbreviated statement:* (5 cred.; jr., sr.; prereq. 6). *Expanded statement:* This course carries five credits, is open to juniors and seniors only, and has for a prerequisite, Course 6 in the same department.

SUBCOLLEGIATE COURSES IN SCHOOL OF AGRICULTURE

A1. Hygiene. Methods of promotion of health and prevention of disease; fundamentals of healthful living; individual and community activities against the spread of disease. (1 cred.) (Fall) (Winter) III S. Dr. Bates.

A4. Rural Sanitation. Disposal of excreta, sewage, and other waste; location, construction, and operation of rural water supplies; sanitary production, handling, processing, and serving of food; control of animals and insects involved in the spread of disease; ventilation and air conditioning; farm and home safety. (3 cred.) (Winter) IV TThS. Mr. Pierce.

A6. Family Care. Hygiene of infancy, childhood, and womanhood; care of illness in the home. (5 cred.) (Limited to 20) (Winter) I-II TThS; VII-IX WF. Miss Vroom.

PUBLIC HEALTH

3f,w,s.* Personal Health. Elementary principles of normal body function; predisposing and actual causes of disease; ways in which disease may be avoided. (2 cred.; fr., soph.; no prereq. Not open to students who have taken Human Biology (G.C.10C.) in the General College) (Fall) VI MW; (Winter) VI MW; (Spring) VI MW; VI TTh. Dr. Thomson.

4w,s.* Health Problems of the Community. Personal health and prevention of disease in the family; relation to community health and disease control, important diseases and their prevention. (2 cred.; prereq. 3 or Human Biology (G.C.10C.) in the General College) Students exempted from P.H. 3 on the basis of military service will not be accepted in this course. (Winter) VI TTh; (Spring) I TTh. Dr. Thomson.

50w,s.* Public and Personal Health. Causes of diseases and of physical defects; fundamental principles and working methods of health conservation and disease prevention. Lectures, discussions, and directed readings. (3 cred.; open to students who have not taken 3, 4, 52, 100, or Human Biology (G.C.10C.) in the General College; no prereq.) III MWF. Dr. Thomson.

51f,s.* Community Hygiene. Elementary concepts of development, spread, and prevention of preventable diseases; community programs for their control. (3 cred.; jr., sr.; prereq. 3, 50, or Human Biology (G.C.10C.) in the General College; not open to students who have taken 4, 50, 52, or 100) Students exempted from P.H. 3 on the basis of military service will not be accepted in this course. (Fall) II MWF; (Spring) IV MWF. Dr. Cowan.

52a,b;f,w,s.* Health Care of the Family. Factors affecting the health of the family as a unit; environmental factors, including elementary sanitation; prevention of accidents; communicable diseases, their transmission and prevention; prenatal and infant hygiene and care; principal problems in preschool and school hygiene; care of the sick room; observation and care of the patient; elementary symptomatology. For home economics students. (3 cred.; soph., jr., sr.; prereq. Bact. 53, Human Physiol. 4; not open to students who have taken 50 or 51) 52a lect., f,s—2 cred. VI MW Dr. Todd; 52b lab., f,w,s—1 cred. VII-VIII T; VII-VIII Th. Miss Vroom.

55w. Nursing and Social Problems in the Control of Gonorrhea and Syphilis. History, prevalence, and epidemiology of gonorrhea and syphilis, public health control measures; individual and family problems resulting from these diseases. Provision will be made for conferences and case discussion. (2 cred.; prereq. 53 or 100 and 62. Soc. 90 or 109 may be substituted by presocial work students; may be taken simultaneously with any of these prerequisites) VI MW. Miss Taylor.

56s. First Aid and Safety for Nurses. Principles of first aid in home, industry, and community; prevention of accidents; organization of community programs in first aid and safety; professional and legal responsibilities of nurses in administering first aid. (3 cred.; nurses only) VI, VII, VIII TTh. Dr. Schaar.

57s.* Health of Infant and Preschool Child. Maternal and child health in public health program, problems of infant and maternal mortality, growth and development of infant and young child, care and feeding of normal infant; prevention and correction of physical defects. (2 cred.; jr., sr.; prereq. 4, or 50, or 51, or 52, or 53, or 100) IV TTh. Dr. Boynton.

58w. Maternal and Child Hygiene. The maternal welfare program; importance of breast feeding; conduct of infant welfare clinics in cities and rural communities; consideration of child of preschool and school age as to malnutrition, physical defects, cardiac

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

† Lectures given fall and spring quarters only. Laboratory sections given fall, winter, and spring quarters.

and nervous disorders. (3 cred.; nurses; prereq. 53 or 100 and 62) VII MWF and one hr. ar. Dr. Boynton.

59f,w,s. Health of the School Child. Mental and physical growth; prevention and control of diseases common to the school-age child; health appraisal; correction of physical defects; emotional problems; care of the handicapped; the school environment and its effect on child health; accident prevention and emergency care; practical problems of health supervision and administration. (3 cred.; prereq. 3 and 4, or 3 and 51, or 50, or 52, or 100) (Fall) I MWF; (Winter) IV MWF; (Spring) VII MWF. Miss Grout, Dr. Thomson.

60f,s. Tuberculosis and Its Control. History of tuberculosis movement and campaign in the United States; early diagnosis and sanatorium treatment; tuberculosis in children; psychology of tuberculosis; supervision of returned sanatoria patients; state program for eradication of tuberculosis; legislation. (2 cred.; nurses, others admitted by special permission; prereq. 4, or 50, or 51, or 52, or 53, or 100 and 62) IV TS. Dr. Myers.

62f,w.* Principles of Public Health Nursing I. Trends, principles and techniques in public health nursing service including family health guidance. (3 cred.; public health nurses, others admitted by permission; prereq. 100 or equiv. but may be taken concurrently) (Fall)¶ I MWF Miss Taylor; VI MWF Ar.; (Winter)¶ I MWF Miss Taylor; VI MWF Ar.

63w,s.* Principles of Public Health Nursing II. Organization of public health nursing services; program planning; evaluation; professional problems in public health nursing. (3 cred.; public health nurses; others admitted by permission; prereq. 62, 53 or 100 or equiv. but may be taken concurrently) (Winter)¶ I MWF Miss Taylor; VI MWF Ar.; (Spring) I MWF Ar.

65f,w,s.‡ Field Work in School Nursing.† Credits allowed according to experience in this field. Working with the school nurse the student observes and participates in the activities included in the school nursing program; special attention to organization, relationships, techniques, methods of informal health teaching, provision for handicapped children, and home visiting. (Cred. ar.; public health nurses only; jr., sr.; prereq. 53 or 100, 62, and 67) Miss Vroom.

66f,w,s.‡ Field Work in Rural Nursing.† Credits allowed according to experience in this field. The student accompanies the rural nurse on her rounds and observes and participates in the activities in a rural nursing program. Special attention to organization for rural health work, methods of health teaching, development of community leadership, planning and conducting classes of various types for differing age groups, home visiting, etc. (Cred. ar.; public health nurses only; jr., sr.; prereq. 53 or 100, 62, and 67) Miss Vroom.

67f,w,s,su.‡ Field Work in Urban Nursing.† Credits allowed according to experience in this field. Lectures, demonstrations, and supervised experience in prenatal and infant clinics and in home visiting. This includes bedside care of all types of cases, with emphasis on promotion of physical and mental health and recognition of social problems. (Cred. ar.; public health nurses only; jr., sr.; prereq. 53 or 100, 62) Miss Vroom, Miss Palmer, and associates.

69f,w,s. School Nursing. Development, organization, and scope of programs; relationship of school nursing to general public health program, to health education in schools, and to school curriculum. (1 cred.; prereq. 53 or 100, and 62, 63, but may be taken simultaneously with 63) Ar. Miss Taylor.

* To receive credit for this course the student must complete both Courses 62 and 63.

† Students must maintain a C average in theory completed before they are admitted to any field work.

‡ A fee of $1 per credit is charged for this course.

¶ I hour is for students who have not had practical experience in public health nursing; VI hour is for students who have had such experience.

70w,s. Practice Teaching in Home Nursing for Public Health Nurses. Includes practice in planning instruction and in teaching adults. (Cred. ar.; jr., sr.; prereq. P.H.67, Ed.81, or permission of instructor) (Enrolment limited) Miss Vroom.

80w.‡‡ Elementary Vital Statistics. Sources of data on population, mortality, morbidity, and natality. Calculation of rates and graphical comparison of time and age trends. (3 cred.; public health nurses and special permission of instructor) VII, VIII TTh. Mr. Treloar.

90. Measurement in Medicine. Classification and measurement as descriptive methods in medicine; frequency proportions and probability; errors of random sampling and judgment of significance by statistical methods. (2 cred.; freshman medical students or special permission of instructor) Ar. Mr. Treloar.

91f.¶ Principles of Human Function. Tissues, physicochemical forces, metabolism, digestion, respiration, neuromuscular functions, circulation. (4 cred.; jr., sr.; prereq. 8 cred. in chemistry and 4 cred. in human anatomy or equivalent; primarily for students in Physical Education and Public Health) IV MWF, VI, VII, VIII W. Dr. Henschel, Dr. Mickelsen.

92w.¶ Principles of Human Function. Endocrines, excretion, reproduction, special senses, central nervous system, growth and senescence. (4 cred.; jr., sr.; prereq. 91 or equiv.; primarily for students in Physical Education and Public Health) IV MWF, VI, VII, VIII T. Dr. Henschel, Dr. Brozek.

95f. Principles of Human Nutrition. Particular reference to public health. The role of nutrients, nutritional composition of foods, food requirements, nutritional aspects of food production and processing, laws and regulations, food habits. (3 cred.; prereq. 8 cred. in chemistry and 10 cred. in biology) II TThS. Dr. Mickelsen.

100f,s. Elements of Preventive Medicine and Public Health. Susceptibility and resistance to disease; occurrence and prevention of communicable, degenerative, and industrial diseases; protection of food, water, and milk; school health work; vital statistics. (5 cred. for students in public health nursing, hospital administration and social work; 4 cred. for medical students; prereq. 3 or 50, or equiv. and a course in bacteriology) Lect. II MWF; Rec. III TTh; VI TTh; (Fall quarter only) VII MW. Dr. Anderson, Dr. Thomson, Miss Taylor.

101f,w,s,su. Public Health Administration and Field Work. A series of field trips to acquaint the student with the activities of the State Board of Health and with problems of water filtration, sewage disposal, and milk sanitation. (2 cred.; senior medical students only) Dr. Thomson.

102f,s. Environmental Sanitation I. Methods for promoting man's health and comfort by controlling his environment; water supply sanitation, food sanitation, pollution abatement; sewage, excreta, and waste disposal; bathing place sanitation, air hygiene, illumination, housing, control of insect and animal vectors of disease, industrial hygiene and sanitation. (3 cred.; sr., grad.; prereq. 50 or 51 or 53 or 100 or by permission or may be taken concurrently with any of these) (Fall) I TThS; (Spring) II TThS. Mr. Pierce, Mr. Olson.

103f,w,s. Public Health Bacteriology. Bacteriologic and serologic diagnosis, public health laboratory administration and methods. (Cred. ar.; grad.; prereq. Bact. 101-102, 116 and permission of instructor) II, III MWF. SBH. Dr. Kabler.

104f-105w. Epidemiology. Factors underlying the spread of infectious diseases, with detailed discussion of selected diseases; simple statistical and epidemiologic methods in the study of diseases. Lectures and laboratory. (6 cred.; jr., sr., grad.; prereq. 53 or 100 and consent of instructor; physicians, others by permission) (Fall) IV MWF; (Winter) III TThS. Dr. Anderson.

‡‡ A fee of $1 is charged for this course.

¶ Both quarters must be completed for credit except with special permission of instructor.

106w. Public Health Administration. Structure, basic functions, and activities of public health agencies; public health laws and regulations; administrative procedures in public health practice; relationship to other governmental and social activities. (3 cred.; physicians, engineers, nurses, social workers, and others by arrangement; prereq. 53 or 100, or equiv. or to be taken simultaneously with any of these prereq.) I TThS. Dr. Anderson.

107f. Child and Adult Hygiene. Promotion of hygiene through public health and community effort, maternal, infant, preschool, school, college, industrial, and adult. Lectures and field trips. (3 cred.; physicians and graduate students in public health nursing or medical social work; prereq. 53 or 100) VI, VII, VIII TTh Dr. Boynton and associates.

108w. Care of the Handicapped Child. Extent of problem; history and development of program for care; types of physical defects; means of prevention and correction; medical social aspects; mental and emotional aspects; vocational training and placement. (2 cred.; prereq. 57, 58). VI TTh Ar.

110f,s. Biometric Principles. Introduction to statistical analysis with emphasis on basic principles of statistical reasoning. The description of univariate distributions, normal correlations, simple tests of significance, and goodness of fit. (3 cred.; jr., sr., grad.; prereq. 18 cred. in biol., sci., or math. through anal. geom.; to be taken with 111) (Fall) III TThS Mr. Treloar; (Winter) I TThS Mrs. Hartman; (Spring) I TThS Mrs. Thornton.

111f,w,s.‡ Biometry Laboratory. Practical training in machine calculation and statistical techniques discussed in 110, with which it is to be taken concurrently. (2 cred.) (Fall) I, II TThS; VI, VII, VIII TTh; I, II MWF; III, IV MWF; VI, VII MWF; VIII, IX MWF Mrs. Thornton; (Winter) III, IV TThS; VI, VII MWF; VIII, IX MWF Mrs. Hartman; (Spring) III, IV TThS; VI, VII MWF; VIII, IX MWF Mrs. Thornton.

112w.* Water Supply Sanitation. Sanitary problems associated with the location, construction, and operation of water supplies, purification works, and distribution systems. Public health supervision of water supplies. Seminars, plan examinations, field and laboratory investigations. (4 cred.; prereq. 102 and 100 or 104) Ar. Mr. Whittaker, Mr. Pierce, Mr. Olson.

113s.* Sewage, Excreta, and Waste Disposal. Public health supervision of, and methods for, the treatment and disposal of sewage, excreta, garbage and other wastes; methods for the study and control of stream, lake, and ground water pollution. Lectures, field and laboratory demonstrations. (4 cred.; prereq. 102 and 104.) III MWF, VI-IX T. Mr. Pierce, Mr. Olson.

114w.* Environmental Sanitation II. Public health supervision of activities in the field of urban and rural sanitation. Demonstration of methods of sanitary control of environmental factors. Lectures, field and laboratory demonstrations. (2 cred.; physicians, nurses, veterinarians, and others by arrangement; prereq. 102) VI-IX W. Mr. Whittaker, Mr. Pierce, Mr. Olson.

115w. Food Sanitation. Sanitary problems associated with the production, processing and distribution of milk, meat, shellfish, and other foods, methods of public health supervision. Lectures, field and laboratory demonstrations. (3 cred.; prereq. 102, 106 and 100 or 104) III WF, VI-IX Th. Mr. Olson, Mr. Adams.

116s.* Public Health Engineering Administration. Administrative organization of environmental sanitation activities at the various levels of government and in other organizations including methods and procedures for supervision and control. (2 cred.;

* Students who have taken Courses 112, 113, or 116 will not be given credit for Course 114.

‡ A fee of $1 is charged for this course.

prereq. 102, 100 or 104, 106 and at least two of the following: 112, 113, 115) Mr. Whittaker.

117f-118w. Sanitary Biology. Survey of plant and animal forms important in environmental sanitation, with special reference to those of concern in problems relating to water supply, sewage treatment, water pollution, bathing places, air pollution, food sanitation, and disease vectors. (Cred. ar.; prereq. consent of instructor) Mr. Olson.

119f,w,s,su.‡‡ Field Practice in Environmental Sanitation. Credits allowed according to experience in this field. (Cred. ar.; by permission) Mr. Whittaker, Mr. Kingston, Mr. Handy.

120s. Correlation Analysis. Total, partial, and multiple normal correlation and regression; correlation ratio; contingency; biserial methods; tetrachoric correlation; rank-order correlation; the symmetrical table and intra-class correlation. Course 121 to be taken concurrently. (3 cred.; prereq. 110) III TThS. Mrs. Hartman.

121s.‡ Correlation Laboratory. Practical training in the techniques of 121, with which it is to be taken concurrently. (2 cred.) Ar. I, II MWF; I, II, TThS; III, IV MWF; VI, VII, VIII TTh. Mrs. Hartman.

122s. Public Health Administration Problems. Conference discussion of selected problems; budgeting and program planning; appraisal of public health procedures and activities. (3 cred.; prereq. 106) IV MWF. Ar.

123f,w,s. Topics in Public Health. Selected readings in public health with discussion based on these readings. (Cred. ar.; prereq. permission of instructor) Staff.

125w. The Community Health Education Program. A course intended primarily for those preparing for leadership in community health education to include organization, administration, and evaluation of community health education programs and the selection, preparation, and use of media commonly employed in health education. (3 cred.; prereq. 100, or 104, and 106, or to be taken concurrently with 106) VIII MWF. Miss Grout.

126f. Industrial Health Problems. Organization of industrial health services, state programs in industrial hygiene. Industrial hazards and their control. Procedures in industrial health services. (3 cred.; prereq. 53 or 100, Chemistry 1-2 or equivalent, or permission of department) Ar. Dr. Foker.

127f. Industrial Health Problems—Nursing Aspects. Organization and administration of nursing service in industrial health programs. Duties of nurses in industry. Program planning; records, relationships; interdepartmental, professional and community evaluation. (1 cred.; to be taken in conjunction with 126) Ar.

129f,w,s.‡‡ Field Work in Industrial Nursing. Planned observation visits to selected industrial health services to demonstrate range of industrial health problems. Supervised experience in industrial medical unit. Weekly conferences. Emphasis on practical functioning of the nurse in industrial and commercial organizations. (Cred. ar.; prereq. 67) Ar. Miss Vroom.

130w. Random Sampling Distributions. A discussion of the sampling distributions of the more familiar statistics, the principles of statistical inference, and analysis of the problems of interpretation of differences, with special reference to small samples. Course 131 should be taken concurrently. (3 cred.; prereq. 110) III TThS. Mrs. Thornton, Mr. Treloar.

131w.‡ Sampling Laboratory. Study of the distributions of statistics derived from small samples by practical test. To be taken concurrently with 130. (2 cred.) I, II MWF; III, IV MWF; I, II TThS; VI, VII, VIII TTh Mrs. Thornton.

133w,s. Mental Hygiene. Discussion of emotional factors underlying wholesome family relations and of problems which interfere with successful adjustment in family and

‡ A fee of $1 is charged for this course.
‡‡ A fee of $1 per credit is charged for this course.

community life. Illustrative case material related to problems met by the public health nurse will be used. (3 cred.; prereq. 62 or experience) II TThS. Dr. Clarke.

135s. Conservation of Hearing. Detection, prevention, and amelioration of hearing impairments as related to public health education, school, industrial, and public health nursing, and medical social service. (1 cred.; prereq. 53 or 100 and 62 or to be taken concurrently) I F Dr. Boies and associates.

136s. Sight Conservation. Conditions that impair human vision; community programs of vision testing and correction of defects; sight conservation programs. (1 cred.; prereq. 53 or 100 and 62 or to be taken concurrently) I W. Dr. Hansen and associates.

137s. Dental Health. Conditions resulting in tooth decay and loss; preventive and corrective measures; mouth hygiene; community programs for dental health. (1 cred.; prereq. 53 or 100 and 62 or to be taken concurrently.) I M. Dr. Jordan.

138f,w,s.‡‡ Field Work in Child Hygiene. Field practice, conferences and seminars in prenatal, infant, and child care. Offered in conjunction with Rochester City Health Department and Rochester Child Health Projects. (Cred. ar.; hours ar.; senior and graduate students; prereq. permission of instructor) Dr. Aldrich, Dr. Spock, Miss Mouw, and associates.

139f,w,s.‡‡ Special Field Work for Students in Mental Hygiene Program. Experience in gaining further insight into handling problems of human dynamics in all age groups; in family agency, county welfare, schools, child guidance centers. (Cred. ar.; prereq. permission of instructor) Miss Taylor and associates.

140f.‡ Vital Statistics. Study of official sources of vital statistics, including population changes, calculation of rates, and graphical exposition of trends. (3 cred.; to be taken in conjunction with 104, permission of instructor) VI, VII WF. Mr. Treloar.

141s. Social and Economic Aspects of Medical Care. A survey of social and economic forces affecting administration and financing of medical care; the need for sickness insurance, group hospitalization; the concern of government in the provision of prepaid medical care. (3 cred.; permission of instructor) IV TThS. Dr. Weaver.

150w.‡ Life Tables. Mortality rates and the construction of the life table. Laboratory course with discussions, offered when sufficient demand exists. (3 cred.; permission of instructor) Ar. Mr. Treloar.

152f,w,s. Industrial Hygiene Engineering. Field and laboratory methods used by the industrial hygiene engineer in the study and control of occupational health hazards. Lectures, field, and laboratory demonstrations. (3 cred.; prereq. permission of instructor) Mr. Pierce.

153s. The Hospital and the Community. Survey of the functions and classifications of hospitals, their organization and relation to general health care in the community, and their relation to established public health agencies both private and public. (1 cred.; prereq. permission of instructor) Ar. Mr. Stephan, Mr. Hamilton.

161f. History and Development of Hospitals. Lectures and seminars in orientation to the hospital field; history of hospitals; development of hospital functions; hospital ownership and control; promoting and building new hospitals; integrated hospital service; functions and organization of national hospital associations and foundations. (5 cred.) III, IV MW, III F. Mr. Hamilton, Mr. Stephan.

162f. Principles of Organization and Management of Hospitals. Lectures, seminars, and field trips in: organization principles; nursing service, nursing education, medical staff; business office, accounting department, admitting, purchasing and stores department, personnel, volunteer service, power plant, maintenance, housekeeping, laundry, dietary. (5 cred.) III TThS, VII, VIII TTh. Mr. Hamilton, Mr. Stephan.

‡ A fee of $1 is charged for this course.

‡‡ A fee of $1 per credit is charged for this course.

163w. Principles of Organization and Management of Hospitals. Lectures, seminars, and field trips in: medical records, out-patient department, x-ray, laboratories, anesthesia, pharmacy, physical therapy, occupational therapy, medical social service, library, mental hospitals, tuberculosis hospitals, chronic hospitals, convalescent hospitals; group practice, training of interns and residents, relations with trustees, and hospital ethics. (5 cred.; prereq. 162) III TThS, VII, VIII TTh. Mr. Stephan, Mr. Hamilton.

164s. Principles of Organization and Management of Hospitals. The personnel department in the hospital, organization and functions, development of sound policies and procedures. Hospitals from a legal standpoint, tax exemption, negligence liability, licensure and medical malpractice. Analysis of financial reports and methods of preparing and utilizing the operating budget, insurance and insurance problems. (5 cred.; prereq. 162, 163) III, IV MW, III F. Mr. Stephan, Mr. Hamilton.

165w. Hospitals in Community Organization. Lectures and field trip; hospitals and their relationship to State Health Departments, City Health Departments, Public Relief Agencies; County Welfare, Child Welfare, Family Welfare, Council of Social Agencies, and to National Health Agencies. (1 cred.) III, IV M. Mr. Stephan.

166w. Hospital Clerkship. Assignment to local hospital for survey or solution of special problem. (1 cred.) Mr. Stephan

167s. Management Problems in Hospital Administration. The assignment and solution of specific managerial problems of varying degrees in scope and in major importance. (4 cred.; prereq. 162, 163, to be taken concurrently with 164) Mr. Hamilton.

168f. Orientation to Medical Sciences. Orientation to medical sciences including medical terminology, basic roots, prefixes, suffixes, and units used in medical vocabulary; normal physiology; fundamentals of medicine and surgery. (1 cred.) VII, VIII W. Dr. Thomson.

169.‡ Administrative Residency. Field work of one calendar year's duration in an approved hospital. Orientation to the specific hospital, weighted rotation through hospital departments, and the performance and solution of special problems. Mr. Stephan.

170s. Supervision in Public Health Nursing. Nature of supervision, classification of activities; methods of supervision, including field visitation, individual counseling, group conferences, staff education programs, administrative functions of supervisors, preparation and selection of supervisors. (3 cred.; prereq. 53 or 100, 61, 63 and experience in public health nursing, or by permission) III MWF Miss Taylor.

171f,w,s. Problems in Public Health Nursing. For advanced students who wish to work on special problems in public health nursing. (Cred. ar.; prereq. 170 or permission of instructor) Ar.

173f,w,s.‡‡‡ Field Work in Supervision. (Cred. ar.; public health nurses only; prereq. 170 or permission of instructor.) Ar. Miss Taylor and associates.

174f,w,s. Supervision Laboratory. Critical analysis of supervisory procedures. Construction of rating scales, experience and efficiency sheets, manuals, and other materials of supervision. (2 cred.; public health nurses only) Ar.

190f,w,s.‡‡‡ Field Work in the Community Health Education Program. Three months of practical field experience in community health education under the supervision of qualified health educators. Details will be worked out in accordance with individual needs of the students. (Cred. ar.; prereq. 125, 227, one academic year of approved study toward a Master's or Doctor's degree either in education or public health.) Miss Grout and associates.

‡ A fee of $100 is charged for this course.

‡‡‡ A fee of $1 per credit is charged for this course.

191w.* Science of Human Nutrition. Evaluation of nutritional status, surveys, undernutrition and malnutrition, special dietetics in social relief and medical practice. (3 cred.; prereq. 8 credits in organic chemistry or biochemistry and Courses 91 and 92 or Physiology 103 or equivalent and consent of instructor) IV MWF. Dr. Mickelsen and Dr. Keys.

192w.* Physiology of Exercise. Mechanics of motion, physical training and detraining, acute and chronic effects of exercise, muscular efficiency, muscular defects. (4 cred.; prereq. 92 or Physiol. 103 or equivalent, and consent of instructor) VI MWF, VII, VIII M. Dr. Keys and staff.

194f. Human Factors in Industry. Job requirements, physiological cost of work, industrial fatigue, industrial hazards, environment, accidents, absenteeism. (3 cred., sr., grad.; prereq. 20 credits in at least two of the following: chemistry, biology, psychology, engineering; primarily for students in the Schools of Business Administration, Public Health, and Institute of Technology) Dr. Brozek, Dr. Simonson.

200f,w,s. Research. Opportunities will be offered by the school and by the various coordinated organizations for qualified students to pursue research work. (Cred. ar.) Dr. Anderson, Dr. Diehl, and others.

201f,w,s. Topics in Biometry. Studies in special topics for advanced students. (Cred. ar.; prereq. 120, 130, or consent of instructor.) Ar. Mr. Treloar, Mrs. Thornton.

202w. Nutrition in Public Health. Current developments in nutrition related to public health. One 90-minute session per week. To be offered in 1949 and alternate years thereafter. (1 cred., limited enrolment) Dr. Keys, Dr. Mickelsen.

204f. Tests and Measurements in the Appraisal of Human Physical Fitness. Current developments in the measurement of strength, endurance, coordination and fitness. One 90-minute session per week. To be offered in 1948 and alternate years thereafter. (1 cred., limited enrolment) Dr. Simonson, Dr. Henschel, Dr. Brozek.

206w. Gerontology. Physiological and psychological problems of old age. One 90-minute session per week. To be offered in 1948 and alternate years thereafter. (1 cred., limited enrolment) Dr. Taylor, Dr. Brozek.

208f. Human Adaptation in Health and Disease. The human body as a whole and its responses to physiological and pathological stresses. One 90-minute session per week. To be offered in 1949 and alternate years thereafter. (1 cred.; limited enrolment) Dr. Keys and staff.

210f,w,s. Seminar in Public Health. (Cred. ar.) IX M. Staff.

211f,w,s. Seminar in Biometry. (1 cred.) Mr. Treloar.

220f,w,s. Reading in Problems of Physiological Hygiene. (Cred. ar.; grad.; consent of instructor)

(a) Electrocardiographic Interpretation. Dr. Simonson
(b) Industrial Fatigue. Dr. Brozek
(c) Physical Training and Detraining. Dr. Henschel.
(d) Human Climatology. Dr. Taylor
(e) Circulatory Mechanics. Dr. Keys
(f) Vitamin Metabolism. Dr. Mickelsen
(g) State and Function of Human Muscle. Dr. Simonson

227f,w,s. Problems in the Community Health Education Program. For advanced students who wish to pursue independent study and experimentation in health education. (Cred. ar.; prereq. consent of instructor) Ar. Miss Grout and associates.

290f,w,s. Research. Research in physiological hygiene and related areas. (Cred. ar.) Staff.

* Both quarters must be completed for credit except with special permission of instructor.

COLLEGE OF EDUCATION

Ed.81. Introduction to Education for Public Health Nurses. Principles, methods, and materials in education as applied to public health nursing situations. Group work will be emphasized. Not open to candidates for a degree in the College of Education.

Ed.C.I.70.‡ Methods and Materials in Safety Education.

Ed.C.I.114.‡ The School Health Education Program. Study of various health organizations in city and state in relation to the school health program; organization of the health education programs within the school; construction of the curriculum in school health; evaluation of the school health education program; preparation and requirements for teaching school health education; health supervision and guidance.

Ed.C.I.129.‡ Principles and Problems of Teaching Social Hygiene. Emphasis will be placed on methods of teaching social hygiene in the public schools and materials for instructional use in the elementary and secondary schools.

Ed.C.I.215.‡ Problems in the School Health Education Program. For advanced students who wish to pursue independent study and experimentation in school health education.

Ed.C.I.216.‡ Field Work in the School Health Education Program. Practical field experience in school health education under the supervision of qualified health educators. Details will be worked out in accordance with individual needs of the students.

Ed.C.I.217.‡ Seminar in the School Health Education Program. Discussion and reports on current problems in school health education.

Phys.Ed.117E. Survey of Problems in Method and Curriculum of School Health Instruction. This is a course for students working for the master of education degree who are interested in problems relating to school health instruction programs. Included in the course are discussions of present trends in this area, review of studies of methods relating to curriculum and development of resource standards for the conduct of this program.

‡ A fee of $1.50 per credit is charged for this course.

GENERAL INFORMATION FOR ALL STUDENTS

EXPENSES

1. Tuition fee per quarter*
   - Resident (full schedule) $30.00
   - Nonresident (full schedule) 75.00
   - Resident, per credit hour 2.50
   - Nonresident, per credit hour 6.25
2. Matriculation deposit*
   - For Graduate School 3.00
   - For others 5.00
3. Incidental fee per quarter* 11.15
4. Special course fees are charged in addition to the regular tuition.

UNIVERSITY FEES

The university year, extending from October to June, is divided into three terms called quarters. On the specified dates (see Calendar) 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. See Privilege Fees, *Bulletin of General Information,* for further instruction on late registration and late payment of fees.

Checks and drafts received in payment of any fee whatsoever are accepted subject to final payment in cash or solvent credits; and all banks in the banking routine of collection of such items are accepted by the student as his own agents, and not those of the University, whether such items be sent directly or indirectly to the payer bank.

RESIDENCE DORMITORIES

For women—Comstock Hall on the Mississippi River Road houses 378 girls and Sanford Hall at 1100 University Avenue Southeast accommodates 275. The charge for board and single room is $160 to $170 per quarter; for occupants of double rooms, $160 per quarter. All applications for residence must be made for the entire school year. Communications requesting residence or regarding prices or any other details should be addressed to the director of the residence halls for women.

Co-operative houses, each in charge of a chaperon, offer comfortable homes for about 145 women. By assisting with the work of the houses, the students are able to keep expenses to $30 a month. Applications may be made to the director of Cooperative Village, 212 Twelfth Avenue Southeast.

ROOMING HOUSES

Room and board may be secured in approved rooming houses accommodating either men or women. Room rent varies from $20 to $25 per month for a single room, and from $16 to $20 per month for a double room. Board at present prices may be secured for $10 to $12 per week for two meals per day. However, the majority of rooming houses are without board. For lists of approved rooming houses consult the Housing Bureau, 204 Eddy Hall, University of Minnesota, Minneapolis 14.

FURTHER INFORMATION

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

* If a student receives a stipend under the terms of the Social Security Act the university recorder should receive official authorization from the State Department of Health as to the payment of university fees before time of registration. The tuition amounts indicated are for registration in the College of Science, Literature, and the Arts, the College of Education, the Graduate School, and for the Course in Public Health Nursing and for candidates for the degree of master of public health in the School of Public Health. For tuition rates for other colleges, the *Bulletin of General Information* should be consulted.

Case return
Editor's office

The Bulletin of the UNIVERSITY *of* MINNESOTA

The Medical School Announcement for the Years 1949-1951

Volume LI, Number 49 November 5, 1948

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THE MEDICAL SCHOOL

ADMINISTRATIVE OFFICERS

James Lewis Morrill, B.A., LL.D., President

Malcolm M. Willey, Ph.D., L.H.D., Vice President, Academic Administration

William T. Middlebrook, B.A., M.C.S., Vice President, Business Administration

Harold S. Diehl, M.A., M.D., D.Sc., Dean of the Medical Sciences

Myron M. Weaver, Ph.D., M.D., Assistant Dean of the Medical Sciences

Ray M. Amberg, Ph.C., Director, University Hospitals

NOTE: The last issue of the *Medical School Bulletin* was for the years 1945-47.

GENERAL INFORMATION

REQUIREMENTS FOR ADMISSION

The minimum requirements for admission to the Medical School are three academic years of college work, totaling 135 quarter credits,* and including certain required courses and course sequences. The minimum scholastic average which may be accepted is "C"; however, in view of the large number of well-qualified applicants each year an average well above "C" is necessary in order to achieve admission. Women are accepted on same basis as men.

Required Premedical Courses—The requirement in quarter credits appears immediately after the subject; after each subject then are indicated the courses in the College of Science, Literature, and the Arts which are acceptable when premedical work is taken at the University of Minnesota. In some cases the total of these credits exceeds the minimum established for admissibility.

English, 12 credits. English A-B-C (Freshman English), 15 credits; or Communication 1-2-3 (12 credits) or exemption from the requirement. Composition 4-5-6 (Freshman Composition), 9 credits, will be accepted as meeting part of this requirement when supplemented by additional credits in English Composition or Speech to make the total at least 12 quarter credit hours.

Mathematics, 10 or 15 credits. Mathematics 1, 5 credits, unless the student has had high school higher algebra; Mathematics 15-16 (Elementary Mathematical Analysis), 10 credits, or equivalent.

Chemistry, 26 credits. Inorganic Chemistry 1-2, 11, or 4-5, 11 (General Inorganic Chemistry), 12 credits; Analytical Chemistry 7 (Quantitative Analysis), 4 credits; Organic Chemistry 61-62 (Elementary Organic Chemistry), 8 credits; and Physical Chemistry 107-108 (Elementary Physical Chemistry), 6 credits.

Physics, 12 credits. Physics 4-5-6 (General Physics), 15 credits.

Zoology, 13 credits. Zoology 1-2-3 (General Zoology), 10 credits; Zoology 83 (Introduction to Genetics and Eugenics), 3 credits.

Psychology, 6 credits. Psychology 1-2 (General Psychology), 6 credits.

Social Science, 12 credits. This is a requirement in general education which may be met in a variety of ways, including course work in anthropology, geography, political science, social science, and sociology.

Humanities, 9 credits. This is a requirement in general education which may be fulfilled with credits earned at the Junior or Senior College level. Course sequences in classics (including languages), comparative philology and linguistics, history, humanities, and philosophy are accepted. History may be counted for credit in Social Science, or for credit in the Humanities area but not toward fulfillment of both requirements.

Elective Premedical Courses—The Admissions Committee will show preference for the applicant who has displayed a well-developed interest in, and aptitude for, a special field of knowledge.

Prospective applicants normally are encouraged to concentrate their electives in the subjects listed below and they should devote at least 18 quarter credits to a major sequence in one of the following. This represents work beyond required premedical courses.

Anthropology	English	Political Science
Biostatistics	Fine Arts	Psychology
Child Welfare	History	Social Science
Classics	Humanities	Sociology
Economics	Philosophy	Speech

* "Credit" means quarter credit. Three quarter credits equal two semester credits. For description of courses of study mentioned see the *Bulletin of the College of Science, Literature, and the Arts* of this University.

Since the courses required for admission provide a concentration in physical and biological sciences, it is usually undesirable for the student who takes only three years of premedical work to devote many elective credits to botany, chemistry, geology, mathematics, physics, or zoology. However, an applicant who has a special interest in one of these particular sciences may be an exception to this general rule.

Most students benefit from a fourth year of general or specialized education before they enter upon the medical course. This longer period of preparation is encouraged by the Admissions Committee of the Medical School.

Foreign Language—Although a reading knowledge of a modern foreign language is not a requirement for admission, competence in at least one foreign language is exceedingly important for those individuals who may become interested in *medical research* or in *graduate training in medicine*. It is recommended that such students devote at least 20 of their elective credits to German, French or another appropriate modern foreign language.

Medical Aptitude Tests—The Medical College Admission Test, which is the medical aptitude test sponsored by the Association of American Medical Colleges, and the Minnesota Medical Aptitude Test must have been taken by the applicant before he can be accepted by the University of Minnesota Medical School. Information concerning the former is obtainable from premedical advisers at most colleges and universities or by correspondence with the Educational Testing Service, Box 592, Princeton, New Jersey. Information concerning the Minnesota Medical Aptitude Test can be obtained by writing to the Counseling Bureau, University of Minnesota. All applicants should take the Sophomore Culture Tests as well as the tests mentioned above.

Health—In order to complete registration in the Medical School a physical examination performed at the Students' Health Service is required. This is ordinarily already on record where premedical work has been completed at the University of Minnesota. Successful applicants from other institutions must receive this examination at the earliest practicable date in their first quarter of residence. Students not already immune are required during the four years of their medical course to be immunized against certain diseases.

MODIFIED ADMISSION REQUIREMENTS

The total number of credits required of superior students who do their premedical work at the University of Minnesota may be diminished at the discretion of the Admissions Committee under the quality credit rule of the College of Science, Literature, and the Arts. Required courses are rarely omitted and then only with the approval of the Admissions Committee of the Medical School.

SELECTION OF STUDENTS AND RESERVATION OF PLACES

Admission to the Medical School will be based primarily upon ability and premedical achievement as demonstrated by aptitude tests and scholastic records, and upon personal qualifications, as indicated by recommendations from persons who know the applicant well and by interviews.

First choice is given to native residents of Minnesota, second choice to residents of adjoining states which do not have medical schools, third choice to residents of other states who have acceptable reasons for desiring to attend this Medical School. Nonresidents are accepted only if their scholarship has been outstanding, and other qualifications indicate that they have unusual promise for the study of

medicine or a career in science. Applicants who make their homes in Minnesota subsequent to graduation from high school are in general considered by the University Admissions Committee in the same category as nonresident applicants.

Application blanks are available at the office of the Medical School. Applications for admission should be filed at least nine months prior to the anticipated date of admission. There is a $5 fee charged for evaluation of premedical credits submitted by nonresidents of Minnesota. *The initial application should be accompanied by a transcript or transcripts of all college work so far completed.*

Accepted applicants will receive a statement for a preliminary fee of $10, to be applied on the tuition for the first quarter. This must be paid within ten days and will not be returned if the student fails to matriculate.

SPECIAL STUDENTS AND IRREGULAR STUDENTS

Medical graduates who register in the Medical School for courses in the regular curriculum or special courses and who are not seeking credit toward a medical degree are designated "special students." Permission for such registration is contingent upon class size and the acceptability of the applicant's credentials.

The designation "irregular student" is applied to registrants in the Medical School who are not following the regular schedule of courses but who are in good standing and are entitled to time credit toward a medical degree. Prolongation of the medical course by such part-time or irregular attendance requires special permission.

ADMISSION WITH ADVANCED STANDING

Students who are honorably dismissed from Class A medical schools may be accepted in advanced classes *provided vacancies exist.* Such students must present credentials covering premedical work and such medical courses as they may have completed successfully. Students are not accepted by transfer after the beginning of the junior year.

LENGTH OF THE SCHOOL YEAR—TUITION AND FEES

The freshman, sophomore, and junior programs of the medical course consist of the regular academic year of approximately nine months plus required attendance at the first term of the Summer Session which follows each of these years. Tuition and incidental fees in each of the three quarters are $88.45 for residents of Minnesota and $161.45 for nonresidents. Both figures are exclusive of breakage deposits. Tuition and incidental fees in the first term of the Summer Session are $44.50 for residents of Minnesota and $81 for nonresidents. The fourth, or senior year, differs from the above through omission of the summer term requirement. Graduation is at the regular spring commencement in June.

Students who take less than the regular course of study may arrange their fees on the basis of $6.50 (nonresidents $12.50) for each credit hour per quarter.

Repetition of a course requires the payment of additional fees.

The privilege of late registration requires the payment of a fee of $2 through the third day of classes. On the fourth day the fee is $2.50 and it increases 50 cents per day thereafter to a maximum of $5.

A graduation fee of $7.50 is required for each degree conferred.

Other Expenses

Expenditures other than for university fees average about $250 per quarter for room and board although some students get along on less. About $75 per year is the average expenditure for books; a microscope which costs approximately $275 must be furnished by the student throughout his medical course. Other instruments which each student is required to have for his exclusive use include dissecting instruments, stethoscope, percussion hammer, hemocytometer, ophthalmoscope-otoscope, steel tape and bandage scissors. Students with veterans' benefits are permitted to rent a microscope from the University.

LOAN FUNDS AND OUTSIDE ASSISTANCE

The University offers no scholarships in the Medical School, but certain loan funds are available to medical students who have demonstrated their ability. A few student assistantships are available in the advanced years of the medical course.

Applicants who are entitled to education benefits under either Public Law 346 (G.I.) or Public Law 16 (Rehabilitation) may address inquiries to Office of the Dean of Students, Bureau of Veterans' Affairs, University of Minnesota.

CLINICAL FACILITIES OF THE MEDICAL SCHOOL

The University Hospitals include under one roof the Elliot and Todd Memorial Hospitals, the Memorial Cancer Institute, the Eustis Children's Hospital, the Psychopathic Unit, and the Students' Health Service, providing a total capacity of 480 beds and 30 bassinets. In addition, a Psychiatric Clinic for children and a general Outpatient Department caring for between 300 and 400 patients a day are included in the University Hospital group.

The Minneapolis General Hospital is affiliated with the Medical School, the principal services being under direction of full-time members of the faculty. This hospital has 671 beds, including 55 bassinets.

The Ancker Hospital of St. Paul (850 beds), the Gillette State Hospital for Crippled Children, St. Paul (250 beds), the Veterans Hospital, Fort Snelling (800 beds), and the Hennepin County Tuberculosis Sanatorium, Glen Lake (691 beds) are used for clinical instruction. Certain clinics are held in other institutions, such as the Shriners' Hospital for Crippled Children, Minneapolis.

Plans are being prepared for the Mayo Memorial Medical Center with construction to be started in 1949. In this Medical Center, which will occupy the central portion of the medical campus and will be connected with the University Hospitals and the fundamental medical sciences buildings, there will be housed the research laboratories and departmental offices of the clinical departments, the School of Public Health and the medical library, etc. Upon completion of the Medical Center the capacity of the University Hospitals will have been increased by 150 beds.

The Variety Club of the Northwest has donated funds for a medical unit to be known as the Variety Club Heart Hospital. This 80-bed research hospital will be devoted to investigation into the causes and cure of heart diseases, especially those affecting children. Construction is scheduled to begin in 1949. The hospital will be physically connected with the University Hospitals.

SPECIAL LECTURES

Several special lectures on medical and related scientific subjects are given each year at the Medical School. For these lectures speakers are secured from the

medical centers of this and other countries. Lectures by members of the Mayo Foundation and by prominent physicians of the state also are scheduled regularly.

The Clarence Martin Jackson Lectureship, a memorial to the former head of the Department of Anatomy, is sponsored annually by the Minnesota Chapter of the Phi Beta Pi Medical Fraternity.

The late Dr. E. Starr Judd, a graduate of the Medical School, class of 1902, and professor of surgery in the Mayo Foundation of the University of Minnesota, generously endowed an annual lectureship in the field of surgery.

In honor of the late Dean Elias Potter Lyon, the alumni and faculty of the Medical School with his many other friends have endowed a lectureship in the field of his major scientific interest, physiology and physiological chemistry.

The L. G. Rigler Lectureship Fund provides for an annual Rigler Lecture in Radiology. The fund was donated by former graduate students, friends and colleagues of Dr. Rigler as a testimony to his inspiring teaching and the development of radiology at the Medical School.

The annual Johnston Lecture in Neurology is named for the late professor of neurology and dean of the College of Science, Literature, and the Arts, Dr. John B. Johnston.

The Duluth Clinic Foundation Lectureship brings to the medical campus each year, through the generosity of the Duluth Clinic, a distinguished guest lecturer who spends several days conducting a series of lectures, seminars, and clinics.

The Alpha Omega Alpha, honor medical society, Phi Delta Epsilon, medical fraternity, Minnesota Pathological Society, and the publishers of the *Journal-Lancet,* each support an annual lecture by a distinguished medical scientist.

These and various other special lectures constitute important opportunities for students to hear distinguished speakers from other medical centers.

ENDOWED PROFESSORSHIPS

Mayo Foundation Professorship of Public Health. This distinguished service professorship was made possible by a gift from the Mayo Properties Association.

George Chase Christian Professorship of Cancer Research. Support has been provided for a period of years by the Citizens Aid Society of Minneapolis.

American Legion Research Professorship in Rheumatic Fever. This research professorship is supported by the Minnesota Department of the American Legion and is for the investigation of rheumatic fever and other heart diseases in children.

THE GRADUATE SCHOOL OF MEDICINE

The Graduate School offers opportunities for study and research in the Medical School in Minneapolis (including the Minneapolis General Hospital, the Miller and Ancker Hospitals in St. Paul, and Minneapolis Veterans Hospital) and in the Mayo Foundation for Medical Education and Research at Rochester.

In the Medical School teaching assistantships for graduate students in the premedical sciences pay $900 per academic year for half-time service. A Bachelor's degree is prerequisite to these. The degree of doctor of medicine and a year of internship are prerequisite to clinical fellowships. About 200 fellowship appointments are available each year at Rochester and Minneapolis.

Further information concerning graduate work in medicine may be found in the special announcement of the Graduate School.

Regulations Concerning the Relation of the Medical School and the Graduate School

No student who has been dropped for scholastic failure in the Medical School may subsequently register for medical courses in the Graduate School unless he first secures readmission to the Medical School.

Students who fail to secure entrance to the Medical School and who then register for medical courses in the Graduate School may not use credits thus obtained toward the medical degree unless permission is secured from the dean of the Medical School *prior to the taking of such courses.*

Graduate students seeking admission to the Medical School will apply on the same basis as other students.

Medical School courses taken by graduate students as part of a *regular graduate program* need not be repeated if the student transfers to the Medical School, provided such work is approved by the head of the department in which the work was taken.

Students who transfer credits to the Medical School from the Graduate School must pay the bursar the difference between the fees of the two schools.

POSTGRADUATE MEDICAL EDUCATION

The Department of Postgraduate Medical Education, in co-operation with the University's Center for Continuation Study, offers unique opportunities to physicians and other medical and hospital personnel to keep abreast of progress in the various fields of medicine and health work. Announcements of these courses, most of which are a week or less in length, can be obtained by addressing the Center for Continuation Study.

A special course entitled the Basic Medical Sciences and Their Clinical Correlations has been arranged for graduate physicians. This course was instituted to help medical officers in their return to civilian practice after separation from military service. It is now open to any physician who has graduated from an approved medical school and who has served his internship in an approved hospital. It is recommended for physicians seeking certification by one of the American specialty boards. This program has been made possible by a special grant to the University of Minnesota by the Kellogg Foundation, Battle Creek, Michigan. Information concerning this program may be obtained from the Director of Postgraduate Medical Education.

OTHER COURSES

The School of Nursing and the School of Public Health are administered by the dean of Medical Sciences. Professional training in public health for physicians, engineers, and nurses is offered jointly by the Medical and Graduate Schools. Courses in medical and x-ray technology, in occupational therapy, and in physical therapy are offered jointly by the College of Science, Literature, and the Arts and the Medical School. A course for dietitians is conducted in the University Hospitals. Circulars descriptive of any of these courses will be sent on request. Courses in medical social service are conducted by the Department of Sociology, the practical work being done in the University Hospitals.

LIBRARY

The medical library is one of the best in this country. It is housed in the Library Building and provides excellent facilities for reference work.

THE MINNESOTA MEDICAL FOUNDATION

The object of this corporation is to promote the welfare of the community by the co-operation of alumni and friends of the Medical School of the University of Minnesota; to improve the undergraduate, graduate, and research functions of that institution; to establish scholarships, lectureships, and professorships; to support research and student loan funds in the Medical School; to publish and promote the publication of a representative medical bulletin; and in general, by all legitimate and usual means, to advance the interests of the University of Minnesota Medical School and its alumni.

PRIZES

Rollin E. Cutts Prize in Surgery

The income from $500 is awarded in the form of a gold medal to that member of the senior class of the Medical School who presents the best thesis based upon original work concerning a surgical subject.

Southern Minnesota Medical Association Prize

The society offers an annual prize of $100 and a medal to the most representative student or students in the senior class of the Medical School. The award is made on the basis of the scholarship, extra-curricular activity, and character of the student.

Borden Company Award

The Borden Company has provided funds which make possible an annual award of $500 for the best original investigation by an undergraduate in the Medical School. The award is made to a senior or seniors in the Medical School shortly before commencement each year.

CURRICULUM

CURRICULUM FOR THE DEGREE OF BACHELOR OF MEDICINE

Classes will be admitted in September 1948 and 1949.

Optional Courses of Study

Candidates may:

a. Pursue the regular curriculum outlined below, or

b. Follow the regular curriculum with modifications to allow special work in some particular department. Such students with the written consent of the dean of the Medical School may register during certain quarters in the Graduate School; and such registration, if major work is done in a Medical School department, may be transferred later to the Medical School to count toward a medical degree. Such students may qualify for advanced degrees such as M.S. and Ph.D. See paragraph under Irregular Programs, page 11.

REGULAR CURRICULUM

Departmental Hours

	Clock Hours		Clock Hours
Anatomy, gross and microscopic	646	Physiological Chemistry	220
Bacteriology	216	Physiology	240
Medicine	848	Preventive Medicine and Public Health	114
Neuropsychiatry	379	Roentgenology	102
Obstetrics	307	Surgery	567
Ophthalmology and Otolaryngology	145	Orientation to Practice	22
Pathology	286	Applied Medical Sciences	99
Pediatrics	404		
Pharmacology	150	Total	4,683

Examinations and Scholarship

Progress in the Medical School is based upon quarterly grades and the maintenance of a "C" average in the course of each quarter. While grades of "A," "B," "C," and "D" are passing, only the first three are awarded honor points—3, 2, and 1 points per credit hour respectively. A student whose average in a given quarter is "C" or better is usually passed to the next quarter without a special review of his work, providing he has no grade below a "D." Students receiving "I" (Incomplete) or "F" (Failure) in any course, and students whose average grade of all courses for the quarter has been below "C" are called before the Examination Committee of that class.

The retention of a student in school or his dismissal because of low scholarship is at the discretion of the Examination Committee. The past record of the student and other circumstances in the case of an "F" or an "I" are reviewed; the privilege of taking make-up examinations, or of removing deficiencies by other means, rests with the Examination Committee.

A student who fails to receive a satisfactory grade after taking a make-up examination will, in most cases, be dismissed from the Medical School by the Examination Committee. A student who is repeating a year's work will be dropped automatically at the end of any quarter in which his scholastic average falls below 1.5 honor points per credit hour.

PLAN OF CLINICAL CURRICULUM

In order to utilize the clinical facilities of the school the junior and senior classes are divided into four divisions known as A, B, C, and D. Students are assigned at the end of the sophomore year to the various divisions of the clerkship.

The clinical years consist of the clerkships and of work in the outpatient clinic together with certain clinical lectures. A clerkship includes services in medicine, surgery, psychiatry and neurology, pediatrics, and obstetrics and gynecology, each of about ten weeks' duration, and twenty-seven weeks devoted to admissions and outpatient clinics in the medical and surgical specialties, including ophthalmology and otolaryngology.

Students interested in investigative problems in medical sciences or in public health may, by petition approved by the head of the department concerned and by the Students' Work Committee, substitute other work for the regular program.

IRREGULAR PROGRAMS

While the course of studies in this school is arranged on the traditional four-year plan, it is believed by the faculty that a rigid curriculum is not desirable and that some students will, in normal times, find it wise to extend their medical education over a longer period. Students who are obliged to work for self-support during school attendance are especially advised to spread their medical course over a longer time than the minimum of twelve quarters. The assistant dean will assist such students in making workable programs.

It is to be understood that the required courses set forth only the minimum fundamental information in the various branches of medical science and only the minimum of clinical experience with which a graduate may begin to practice. Attention is directed to the elective courses scheduled in the various departments and to the opportunities offered by the Graduate School. Able students are urged to undertake advanced work and research in some chosen field, for the purpose of advancing medical knowledge and of preparing themselves to fill teaching positions or to carry the investigative spirit into their medical practice. Their attention is called to the Honors Course described below. The dean and the heads of departments will advise such students and will assist them to lay out programs suitable to their needs. Petitions for reasonable substitutions in the required curriculum will be approved.

HONORS COURSE

The Honors Course is a mechanism through which superior students may pursue their studies with greater freedom than is possible by adhering to the regular curriculum.

Only junior and senior students are eligible to pursue the Honors Course, all students being required to take the regular curriculum of the first and second years.

Students having an average of "B" or better in the freshman and sophomore years and who are candidates for a graduate degree may petition the Honors Course Committee to become "honors" students.

Those whose petitions are approved may pursue medical studies in such order and manner as may be determined by the committee. Each year the honors student must submit his program to the committee for approval before putting it into effect.

When an honors student is prepared in the work of any department in accordance with such a program he may, with written permission of the committee, take an examination, the nature of which is determined by the department.

Satisfactory completion of the examination entitles an honors student to credit on the recorder's books for the number of hours assigned to the department in the regular curriculum.

Should an honors student fail to qualify for a graduate degree, all previously taken department examinations will be cancelled and the student will be required to take the junior and the senior examinations under the usual rules.

When an honors course student has fulfilled the legal time requirement, has attained his graduate degree, and has passed the respective departmental examinations, the Honors Course Committee will consider his general work, his various examinations, and his research achievements; on recommendation of the committee, the M.B. degree will be granted.

At any time during his course of study, on recommendation of the committee, an honors student may be required to return to the regular curriculum, the results of previously taken departmental examinations being cancelled.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE

The baccalaureate degree in either arts or science must have been obtained by each medical student before he can enter upon his junior year of the medical course. The requirements for this degree are:

a. Completion of the premedical college work in accordance with the requirements for admission to the Medical School and regulations of the Arts College of the University of Minnesota.

b. Successful completion of the required courses of the first two academic years of the medical course.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF MEDICINE

Good moral character, compliance with the admission requirements, fulfillment of the requirements for the degree of bachelor of arts or science, completion of the curriculum of the Medical School, and compliance with the rules of scholarship.

CURRICULUM FOR THE DEGREE OF DOCTOR OF MEDICINE

Students who have attained the M.B. may qualify for the M.D. by:

a. Completion of a year of internship in a hospital approved by the Internship Committee, or

b. Completion of one year's work of advanced character in an approved laboratory, or

c. An approved year of advanced study or work in public health.

COURSES FOR PHYSICIANS

Physicians who desire to attend medical lectures and clinics for a limited period of time may obtain a visitor's permit from the dean. They may enter for regular lecture and clinical courses in the Medical School upon payment of the usual Medical School fees. On this basis they may arrange for special courses of study in anatomy, physiology, experimental surgery, cadaver surgery, pathology, bacteriology, pharmacology, etc., as the facilities of the respective departments will permit.

Special courses, usually one week in length, in the various fields of medicine, are offered throughout the year by the Department of Postgraduate Medical Education in co-operation with the Center for Continuation Study.

For continuation courses in the Basic Medical Sciences and Their Clinical Correlations and shorter intensive courses in the Medical Sciences, see section on Postgraduate Medical Education, page 8.

DESCRIPTION OF COURSES

ANATOMY

Departmental Office, 201 Institute of Anatomy
Edward A. Boyden, Professor and Chairman

Professors Edward A. Boyden, Ph.D., Chairman, Andrew T. Rasmussen, Ph.D., Richard E. Scammon, Ph.D., LL.D.; Professor Emeritus Hal Downey, Ph.D.; Associate Professors Berry Campbell, Ph.D., Arthur Kirschbaum, Ph.D., M.D., Lemen J. Wells, Ph.D.; Assistant Professors J. Francis Hartmann, Ph.D., R. Dorothy Sundberg, Ph.D., W. Lane Williams, Ph.D.; Instructor Marthella J. Frantz, B.S.; Teaching Assistants Harold Brody, B.S., Ronald A. Dolan, M.D., Rachel Fralich, B.S., Harold N. Haft, B.A., Lewie O. Ingersoll, B.S., Louis C. Lick, M.D., David W. Molander, M.D., Arthur E. Sethre, B.A., Roger A. Smith III, M.D., Richard H. Swigart, B.A.

REQUIRED COURSES

1. Anatomy for Embalmers. 132 hours. Dolan and assistants.
3. Elementary Anatomy. For three-year student nurses and dental hygienists. 44 hours; 4 credits. Frantz and assistants.
4. Elementary Anatomy. For medical technologists and five-year student nurses. 55 hours; 5 credits. Frantz and assistants.
57. Elementary Anatomy. For students of physical education. 66 hours; 4 credits.
58. Anatomy of Extremities. For physical therapists. 66 hours; 4 credits. Prerequisite, Course 3 or 4.
59. Systematic Anatomy. For freshman dental students. 132 hours; 6 credits. Enrolment limited. Hartmann and assistants.
100-101. Gross Human Anatomy. Dissection, including osteology. For freshman medical students. 308 hours; 16 credits. Enrolment limited. Boyden, Wells, and assistants.
102. Anatomy of the Head and Neck. For freshman dental students. Prerequisite, Course 59; 132 hours; 7 credits. Enrolment limited. Hartmann and assistants.
103-104. Human Histology. Microscopic study of the various tissues and organs. For freshman medical students. Prerequisite, Course 100; 136 hours; 8 credits. Enrolment limited. Kirschbaum, Williams, and assistants.
105. Microscopic Anatomy. For sophomore dental students. Prerequisite, Course 59; 165 hours; 9 credits. Enrolment limited. Rasmussen, Campbell, and assistants.
107. Human Embryology. Development of the human body. For freshman medical students. 77 hours; 5 credits. Enrolment limited. Wells and assistants.
111. Human Neurology. A study of the central nervous system and sense organs. For freshman medical students. Prerequisites, Courses 103, 107; 96 hours; 6 credits. Enrolment limited. Rasmussen, Campbell, and assistants.

ELECTIVE COURSES

In general, the elective courses are for small groups of 6 to 16 students. For registration in these courses, permission of the instructor is required.

129-130. Topographic Anatomy. Based upon a study of serial cross sections of the human body. Prerequisite, Course 100-101; hours and credits arranged. Boyden. (Temporarily discontinued.)
132. Anatomical and Functional Aspects of Reproduction. Lectures and demonstrations of experimental animals. 22 hours; 2 credits; hours arranged. Wells.

134. Anatomy of the Newborn. A detailed laboratory study of the anatomy of the newborn. Limited to 12 students. Prerequisite, Courses 100, 101, 107, or equivalent; 66 hours; 3 credits each quarter. Wells.
149. Experimental Neurology. A study of the morphology of the central nervous system as determined by experimental methods. Prerequisite, Course 111; hours and credits arranged. Campbell.
150. Special Topics in Neurology. Study of the literature on selected phases of human neurology. Prerequisite, Course 111; hours and credits arranged. Rasmussen.
152. Prosection. Preparation of special dissections to be used for demonstrations in human gross anatomy. Prerequisite, Course 100-101; hours and credits arranged. Boyden.
153-154-155-156.* Advanced Anatomy. Advanced work, largely individual in character, in gross anatomy, histology, embryology, hematology, neurology, or experimental morphology. Hours and credits arranged. Boyden, Rasmussen, Campbell, Kirschbaum, Wells, Hartmann, Sundberg, and Williams.
157. Developmental Anatomy of the Head. Prerequisite, Course 107; 22 hours; 2 credits. Boyden. (Temporarily discontinued.)
158. Special Histology and Neurology of the Head Region. Prerequisites, Courses 103, 111; 66 hours; 4 credits. Rasmussen.
159. Experimental Methods for the Study of Neoplastic Growths. Hours and credits arranged. Kirschbaum.
160. Seminar in Problems of Reproduction. 11 hours; 1 credit. Wells.
164. Segmental and Topographic Anatomy of the Lung. Hours and credits arranged. Boyden.
165-166. Hematology. Primarily for medical students, but open to others with proper qualifications. Normal and pathologic morphology of the blood and blood-forming organs, with special emphasis on the study of the blood from the standpoint of diagnosis and prognosis. Written permission of instructor required. 4 credits each quarter. Microscope fee $6.00 per quarter. Sundberg.
167. Seminar in Hematology. Discussion of literature and research. Prerequisite, Course 165-166; 11 hours; 1 credit. Sundberg.
201-202-203-204.* Research in Anatomy. Research work in gross or microscopic anatomy, neurology, hematology, histology, or embryology. Hours and credits arranged. Boyden, Rasmussen, Scammon, Campbell, Kirschbaum, Wells, Sundberg, and Williams.
205-206-207.* Anatomical Seminar. Presentation and discussion of research work in progress in the department, together with reviews of current anatomical literature. 11 hours; 1 credit. Boyden and staff.

BACTERIOLOGY AND IMMUNOLOGY

Departmental Office, 227 Millard Hall
Jerome T. Syverton, Professor and Head

Professors Jerome T. Syverton, M.D., Head, H. Orin Halvorson, Ch.E., Ph.D.; Associate Professors Tom R. Hamilton, M.D., M.S., Newell R. Ziegler, M.D., Ph.D.; Assistant Professors Wendell H. Hall, M.D., William F. McLimans, Ph.D.; Instructors Helene Brumfield, M.S., Alan Jay, M.D., M.S.,

* These courses may be taken continuously through three or four quarters in any one year.

Henrik De Kruif, M.D., George W. Lones, M.S., William D. McBride, D.D.S., Frank J. Roth, M.S., Cyril S. Stulberg, Ph.D.

REQUIRED COURSES

1. Elementary Bacteriology. For students in Nursing and others. 66 hours; 4 credits. Staff.

53. General Bacteriology. For students in Home Economics and Agriculture. Prerequisites, 10 credits in chemistry and 4 credits in botany or zoology; 99 hours; 5 credits. Staff.

100. Bacteriology for Dental Students. 132 hours; 6 credits. De Kruif and McBride.

102. Medical Bacteriology. The pathogenic bacteria, especially in their relationship to disease; principles of infection and immunity. For students other than medical students. Prerequisites, Bacteriology 53; 99 hours; 5 credits. Syverton, Ziegler, De Kruif, and staff.

105-106. Principles of Infectious Disease. The instruction, which includes medical bacteriology, immunology, mycology, and virology, is designed to familiarize medical students with the factors that operate to result in an infectious process. Especial emphasis is given to the principles and technics that make possible the diagnosis, treatment, and prevention of specific infectious disease. Prerequisites, Histology 103, Physiological Chemistry 100 or 101 or Biochemistry 120; 216 hours; 10 credits. Syverton and staff.

ELECTIVE COURSES

104. Sanitary Bacteriology. Prerequisites, Bacteriology 53 and 15 credits in chemistry; 77 hours; 4 credits. Enrolment limited to 15 students. Ziegler.

114. General Mycology. Prerequisites, Bacteriology 53 or 105; 66 hours; 4 credits. Roth.

116. Immunology. A study of the mechanisms of the interactions between the host and the parasite. The technics and theories of serologic procedures; laws of hemolysis, quantitative relationship between antigen and antibody: opsonins, serums, vaccines, toxin, antitoxin, complement fixation, neutralization, precipitative and agglutinative reactions, blood grouping, atopy, anaphylaxis. Prerequisite, Bacteriology 102 or 105; 66 hours; 3 credits. McLimans.

121-122. Physiology of Bacteria. Growth; enzymes; metabolism; dormancy; death. Prerequisites, Bacteriology 53 and 8 credits in organic chemistry or biochemistry; 33 hours; 6 credits. Halvorson and Lones.

123. Applied Bacteriology. Industrial fermentations; bacteriology of water and sewage. Prerequisite, Bacteriology 121-122; 33 hours; 3 credits. Halvorson.

124. Viruses and Rickettsia. Character, nature, and transmission of viruses and rickettsia; important virus and rickettsial diseases. Prerequisites, Bacteriology 102 or 105, Histology 103 or 149, and Pathology 101; lectures and laboratory; 44 hours; 4 credits. Syverton and McLimans.

201. Research in Bacteriology and Immunology. Graduate students with the requisite preliminary training may elect research, either as majors or minors in bacteriology or immunology. Hours and credits arranged. Syverton, Halvorson, McLimans, and Ziegler.

203. Seminar. 1 hour; 1 credit. Staff.

PATHOLOGY

Departmental Office, 110 Institute of Anatomy
Elexious T. Bell, Professor and Head

Professors Elexious T. Bell, M.D., Head, A. B. Baker, M.D., Ph.D., Benjamin J. Clawson, M.D., Ph.D.; Associate Professors Robert Hebbel, M.D., Ph.D., Kano Ikeda, M.D., Nathaniel H. Lufkin, M.D., M.S., James S. McCartney, Jr., M.D., John F. Noble, M.D.; Assistant Professor Ambrose J. Hertzog, M.D., Ph.D.; Instructors S. Steven Barron, M.D., Ellery James, M.D., Frederick Latt, M.D., L. Lewellyn, M.D., Stanley V. Lofsness, M.D., Walter Subby, M.D.; Medical Fellows James D. Cardy, M.D., Craig W. Freeman, M.D., Jack Gordon, M.D., Allen S. Judd, M.D., Paul H. Lober, M.D., Louis Thomas, M.D., John A. Williams, M.D.

REQUIRED COURSES

100. Pathology for Students in Dentistry. 143 hours, 8 credits. Clawson and assistants.

101. Pathology. General Pathology. For sophomore medical students. Prerequisites, histology, embryology, and special bacteriology; 143 hours; 8 credits. Bell, Clawson, McCartney, Hebbel, and assistants.

102. Pathology. Special Pathology. For sophomore medical students. Prerequisites, Pathology 101; 143 hours; 8 credits. Bell, Clawson, McCartney, Hebbel, and assistants.

ELECTIVE COURSES

104. Autopsies. For junior and senior medical students. Bell and staff.

107. Advanced Pathology. Prerequisite, Pathology 102. 107. Surgical Pathology. 44 hours; 3 credits. McCartney; 107a. Surgical Pathology. 44 hours; 3 credits. McCartney; 107b. Diseases of the Heart. 44 hours; 3 credits. Clawson; 107c. Diseases of the Kidney. 44 hours; 3 credits. Bell.

110. Seminar in Pathology. Prerequisite, Pathology 102. Bell.

111. Conference on Autopsies. Prerequisite, Pathology 102. Bell and staff.

112. Advanced Neuropathology. (See Neurology 150, 210.) Hours and credits arranged. Baker.

114. Problems in Neuropathology. (See Psychiatry 146.) Hours and credits arranged. Baker.

115. Neuropathology. (See Neurology 143.) Hours and credits arranged. Baker.

116. Intracranial Neoplasms. (See Neurology 211.) Hours and credits arranged. Baker.

117. Survey of Neuropathology. (See Neurology 151.) Examination of specimens from current autopsies. Baker.

201. Research. Graduate students of the necessary preliminary training may elect research in pathology as either a major or a minor field. Hours and credits arranged. Bell and staff.

PHARMACOLOGY

Departmental Office, 105 Millard Hall
Raymond N. Bieter, Professor and Head

Professor Raymond N. Bieter, M.D., Ph.D., Head; Associate Professor Harold N. G. Wright, Ph.D.; Associate Professor Emeritus Edgar D. Brown, Phm.D., M.D.; Assistant Professor Elizabeth M. Cranston, Ph.D.; Teaching Assistants Wayne A. Chadbourn, M.D., Joseph G. Graca, B.S., Thomas O'Dell, B.S.

REQUIRED COURSES

8a. Pharmacology for Nursing Students. Lecture 11 hours; 1 credit. Wright, Cranston, and others.

8. Pharmacology for Nursing Students. A continuation of Pharmacology 8a. 44 hours; 3 credits.

101. Introduction to Pharmacology. Prerequisites, Physiology 106 and 107, or equivalent; 22 hours; 2 credits. Fall quarter, for dental and pharmacy students; winter quarter, for medical students; spring quarter, for veterinary students. Bieter, Wright, Cranston, and others.

102. General and Experimental Pharmacology. A detailed lecture and laboratory study of important drugs. Prerequisite Pharmacology 101; 132 hours; 8 credits. Spring quarter, for sophomore medical students. Bieter, Wright, Cranston, and assistants.

105. General and Experimental Pharmacology. A detailed lecture and laboratory study of important drugs. Prerequisite, Pharmacology 101; 110 hours; 6 credits. Fall quarter, for veterinary students; winter quarter, for dental and pharmacy students. Bieter, Wright, Cranston, and assistants.

106. General Pharmacology. A lecture continuation of Pharmacology 105. 22 hours; 2 credits. Spring quarter, for dental and pharmacy students. Bieter, Wright, and Cranston.

108. Prescription Writing. Prerequisites, Pharmacology 101 and 102 or Pharmacology 101, 105, and 106. Winter quarter, for veterinary students; spring quarter, for dental, pharmacy, and medical students. 11 hours; 1 credit. Wright.

ELECTIVE COURSES

109. Pharmacological Problems. Experimental study of special topics in pharmacology, with a review of the literature. Credits and hours arranged. Bieter, Wright, or Cranston.

110. Toxicology. A study of systemic qualitative toxicological analysis. Lecture and laboratory. Lectures only may be taken if desired. Credits and hours arranged. Wright.

111. Advanced Toxicology. A laboratory study of quantitative toxicological analysis. Prerequisite, Pharmacology 110, or may be taken simultaneously; credits and hours arranged. Wright.

123. Special Topics in Pharmacology. 22 hours; 2 credits. Bieter, Wright, and Cranston.

124. Pharmacology of Special Systems. Lectures and conferences on the more detailed pharmacology of special organ systems (i.e., cardiovascular system, autonomic nervous system, etc.) and the clinical applications thereof. 33 hours; 3 credits. Bieter, Wright, and Cranston.

203. Research in Pharmacology. Prerequisites, Pharmacology 101 and 102 or equivalent, plus permission of instructor; hours and credits arranged. Bieter, Wright, or Cranston.
204. Advanced Pharmacology. Prerequisites, Pharmacology 101 or equivalent, plus permission of instructor; 11 hours; 1 credit. Bieter, Wright, or Cranston.
205. General Discussions in Pharmacology. A seminar. Prerequisites, Pharmacology 101 or 102 or equivalent, plus permission of instructor; 11 hours; 1 credit. Bieter, Wright, or Cranston.

PHYSIOLOGY

Departmental Office, 318 Millard Hall
Maurice B. Visscher, Professor and Head

Professors Maurice B. Visscher, M.D., Ph.D., Head, John J. Bittner, Ph.D., Ernst Gellhorn, M.D., Ph.D., Allan Hemingway, Ph.D., Karl W. Stenstrom, Ph.D., Herbert S. Wells, M.D.; Professor Emeritus Frederick H. Scott, Ph.D., D.Sc.; Associate Professors Joseph T. King, M.D., Ph.D., Nathan Lifson, M.D., Ph.D.; Assistant Professors Robert A. Huseby, M.D., Ph.D., Roger M. Reinecke, M.D., Ph.D.; Instructors Gilbert S. Campbell, M.D., R. Bryce Harvey, M.D., Akira Omachi, B.A.; Teaching Assistants Robert C. Bolin, M.D., Lester L. Erickson, B.A., Robert L. Ginsberg, M.D., George Gordon, M.D., John A. Johnson, B.A.; Research Assistants Francis J. Haddy, M.D., Jane Hyde, M.S., Maurice N. Johnson, M.D., Arnold Lehmann, M.D., John R. McQuillan, M.D., Gerald Nudell, M.D., Francis Stutzman, M.D., Samuel Zinberg, M.D.

REQUIRED COURSES

4.* Human Physiology. For academic, home economics, and pharmacy students. 44 hours; 4 credits. Ar.
60.* Human Physiology. Primarily for medical technology students and nurses in the 5-year program. 88 hours; 6 credits. Lifson and others.
101.* Human Physiology. For dental students and others. Prerequisites, zoology and organic chemistry; 154 hours; 10 credits. Visscher, Gellhorn, and others.
105. Roentgen Rays, Light, and Radium. The physical and physiological basis of physical therapy. Junior medical students. Prerequisites. Course 106-107; 11 hours; 1 credit. Stenstrom.
106-107.† Human Physiology. For freshman medical students and others. Prerequisites, organic chemistry, zoology, and neurology; 240 hours; 15 credits. Visscher, Gellhorn, and others.

ELECTIVE COURSES

113. Problems in Physiology. Arranged with qualified students. Each student will be assigned a topic for special laboratory study. Conferences and reading. May be taken one or more quarters. Prerequisite, Course 106-107, or equivalent; 66 hours; 3 credits each quarter or arranged. Visscher, Gellhorn, and others.
115. Seminar on Topics in General Physiology. Arranged with qualified students. Hours and credits arranged.

* Courses 4, 60, and 101 are intended for those who desire a less detailed consideration of physiology than that given in Course 106-107. Students may not receive credit for these courses in addition to Course 106-107.

† Formerly 103-104.

116. Seminar on Circulation. Arranged with qualified students. Hours and credits arranged.
117. Seminar on Respiration. Arranged with qualified students. Hours and credits arranged.
118. Seminar on Digestion. Arranged with qualified students. Hours and credits arranged.
119. Seminar on Excretion and Water Balance. Arranged with qualified students. Hours and credits arranged.
120. Seminar on Metabolism and Nutrition. Arranged with qualified students. Hours and credits arranged.
121. Seminar on Temperature Regulation. Arranged with qualified students. Hours and credits arranged.
122. Seminar on Internal Secretions. Arranged with qualified students. Hours and credits arranged.
123. Seminar on Reproduction. Arranged with qualified students. Hours and credits arranged.
124. Seminar on the Central Nervous System. Arranged with qualified students. Hours and credits arranged.
125. Seminar on Special Senses. Arranged with qualified students. Hours and credits arranged.
140. Seminar in Cancer Biology. Hours arranged; 1 credit. Bittner.
141. Problems in Cancer Biology. Hours and credits arranged. Bittner.
170. Problems in Biophysics. Special work arranged with qualified students. Stenstrom.
201. Seminar in Physiology. For advanced students. 11 hours; credits arranged. Visscher and staff.
202. Readings in Physiology. Topics will be selected for each student and written reviews will be prepared and discussed. 1 to 3 credits arranged. Visscher, Gellhorn, King, and others.
203. Research in Physiology. Hours and credits arranged. Visscher, Gellhorn, Hemingway, King, Lifson, and others.
204. Research in the Physics and Physiology of Radiation. Hours and credits arranged. Stenstrom.

For electives in the practical aspects of radiology and allied subjects offered by Dr. Stenstrom, see Radiology, page 37.

206. Seminar in History of Physiology and Related Sciences. 11 hours; 1 credit. Visscher.
207. Research in Cancer Biology. Credits and hours arranged. Bittner.
208. Special Topics in Clinical Physiology. Credits and hours arranged.

PHYSIOLOGICAL CHEMISTRY

Departmental Office, 17 Medical Sciences
Wallace D. Armstrong, Professor and Head

Professors Wallace D. Armstrong, Ph.D., M.D., Head, Walter O. Lundberg, Ph.D., Karl Sollner, Ph.D.; Associate Professors Cyrus P. Barnum, Jr., Ph.D., David Glick, Ph.D.; Assistant Professors Saul L. Cohen, Ph.D., Elizabeth G. Frame, Ph.D., S. H. Zabarsky, Ph.D.; Instructors Ernest B. Brown, Jr., M.S., Charles W. Carr, Ph.D.

REQUIRED COURSES

1.‡ Physiological Chemistry for Nurses. 4 credits. Frame.

50.* Physiological Chemistry. For physical education students and others. Prerequisite, general chemistry; 44 hours; 4 credits. Carr and others.

100.‡ Physiological Chemistry. For freshman medical students and others. Prerequisites, organic and physical chemistry and physics; 110 hours, 7 credits. Armstrong, Barnum, Glick, Cohen, and Carr.

101.‡ Physiological Chemistry. For freshman medical students and others. Prerequisite, Physiological Chemistry 100; 99 hours; 6 credits. Armstrong, Barnum, Glick, Cohen, and Carr.

102. Physiological Chemistry. For freshman veterinary medicine students and others. Prerequisite organic chemistry; 99 hours; 6 credits. Armstrong, Barnum, Glick, Cohen, and Carr.

103. Physiological Chemistry. For freshman veterinary medicine students and others. Prerequisite, Physiological Chemistry 102; 99 hours; 6 credits. Armstrong, Barnum, Glick, Cohen, and Carr.

104. Physiological Chemistry. For freshman dental students and others. Prerequisite, organic chemistry; 99 hours; 6 credits. Armstrong, Barnum, Glick, Cohen, and Carr.

105. Physiological Chemistry. For freshman dental students and others. Prerequisite, Physiological Chemistry 104; 44 hours; 4 credits. Armstrong, Barnum, Glick, Cohen, Zabarsky, and Carr.

ELECTIVE COURSES

153. Problems in Physiological Chemistry. Special work arranged with qualified students. May be taken one or more quarters. Prerequisite, Course 100-101; hours and credits arranged. Armstrong, Barnum, Glick, Cohen, Frame, and Carr.

200. Seminar in Physiological Chemistry. Armstrong, Barnum, Glick, Cohen, Frame, and Carr.

205. Research in Physiological Chemistry. Hours and credits arranged. Armstrong, Barnum, Glick, Cohen, Frame, and Carr.

206. Advanced Endocrinology and Steroid Chemistry. Prerequisite, Physiological Chemistry 100-101; 3 credits. Cohen. (Offered in sessions which begin with an odd numbered year and only if 8 or more students are registered.)

207. Ionic Equilibria and Mineral Metabolism. Prerequisite, Physiological Chemistry 100-101; 3 credits. Armstrong. (Offered in sessions which begin with an odd numbered year and only if 8 or more students are registered.)

208. Advanced Laboratory Technique. Prerequisite, Physiological Chemistry 100-101; 3 credits. Armstrong, Barnum, Glick, Cohen, Frame, and Carr. (Offered in sessions which begin with an odd numbered year; registration limited to 10 students.)

209. Histochemistry. Prerequisite, Physiological Chemistry 100-101 and histology or permission of instructor; 3 credits. Glick. (Offered in sessions which begin with an even numbered year and only if 8 or more students are registered.)

* Sequences 50 and 56,57 are intermediate courses intended for those who desire a less detailed consideration of physiological chemistry than that given in 100,101. Students may not receive credit for both intermediate and advanced sequences, nor for Course 1 in addition to either of these sequences.

‡ The student must purchase a $5 physiological chemistry card from the bursar in the Administration Building. No student will be assigned a desk in the laboratory until he presents this card. The cost of special chemicals, nonreturnable equipment, and breakage will be charged against the deposit.

210. Advanced Nitrogen Metabolism. Prerequisite, Physiological Chemistry 100-101; 3 credits. Frame. (Offered in sessions which begin with an even numbered year and only if 8 or more students are registered.)
211. Advanced Intermediary Metabolism. Prerequisite, Physiological Chemistry 100-101; 3 credits. Barnum. (Offered in sessions which begin with an even numbered year and only if 8 or more students are registered.)
212. Histochemistry Laboratory. Selected problems in the field of histochemistry designed to meet the interests of the individual. Prerequisite, Physiological Chemistry 100-101, permission of instructor; hours and credits arranged. Glick.
236. Radio Isotope. Seminar. 11 hours. (Same as Radiology 236.) Stenstrom, Moore, Armstrong, and staff.

SCHOOL OF PUBLIC HEALTH

Departmental Office, 121 Millard Hall
Gaylord W. Anderson, Professor and Director

Division of Public Health Administration and Epidemiology

Professors Gaylord W. Anderson, M.D., Dr.P.H., Director, Ruth E. Boynton, M.S., M.D., Harold S. Diehl, M.A., M.D., D.Sc., J. Arthur Myers, M.D., Ph.D.; Clinical Professor Emeritus Albert J. Chesley,* M.D.; Associate Professors Stewart C. Thomson, M.S., M.D., M.P.H., Myron M. Weaver, Ph.D., M.D.; Clinical Associate Professor§ Emeritus Orianna McDaniel,* M.D.; Assistant Professor Albert L. Burroughs, Ph.D.; Lecturers Robert N. Barr,* M.D., M.P.H., Jerome W. Brower,* M.A., D.S.L., LL.B., Dean S. Fleming,* M.D., M.P.H., Leslie W. Foker, M.D., M.P.H., Frank J. Hill,¶ B.S., M.D., M.P.H., William A. Jordan,* D.D.S., M.P.H., Paul W. Kabler,* Ph.D., M.D., M.P.H., Hilbert Mark,* M.D., M.P.H., Viktor O. Wilson, M.D., M.P.H.

REQUIRED COURSES

100. Elements of Preventive Medicine and Public Health. Susceptibility and resistance to disease; occurrence and prevention of communicable, degenerative, and industrial diseases; protection of food, water, and milk; school health work; vital statistics (5 credits; nurses and students in pre-social work; prereq. 3 or 50, or equivalent and a course in bacteriology; 6 credits for medical students). Anderson, Thomson, Taylor.
101. Public Health Administration and Field Work. A series of field trips to acquaint the student with the activities of the State Board of Health and with problems of water filtration, sewage disposal, and milk sanitation. For senior medical students. 12 hours; 2 credits. Thomson.
142. Medical Economics. An examination of the present structure and financing of medical care and other health services in the United States; including proposed changes. For senior medical students. 22 hours; 2 credits. Weaver.

ELECTIVE COURSES

58. Maternal and Child Hygiene. For public health nurses. 3 credits. Boynton.
60. Tuberculosis and Its Control. 2 credits. Myers.
103. Public Health Bacteriology. Credits arranged. Kabler.

* Member of staff of State Department of Health.
§ Titles prefixed by "clinical" indicate appointment on a part-time basis.
¶ Member of staff of Minneapolis City Health Department.

104. Epidemiology I. For graduate physicians in public health or others by permission. 3 credits. Anderson.
105. Epidemiology II. For physicians. 3 credits. Anderson.
106. Public Health Administration—General. For physicians, engineers, nurses, and social workers. 3 credits. Anderson.
107. Child and Adult Hygiene. For physicians. 3 credits. Boynton and associates.
108. The Care of the Handicapped Child. 2 credits.
122. Public Health Administration—Problems. 3 credits. Anderson.
123. Topics in Public Health. Credits arranged. Anderson.
126. Industrial Health Problems. 3 credits. Foker.
135. Conservation of Hearing. 1 credit. Boies and associates.
136. Sight Conservation. 1 credit. Hansen and associates.
137. Dental Hygiene. 1 credit. Jordan.
141. Economic and Social Aspects of Medical Care. 3 credits. Weaver.
200. Research. Credits arranged. Anderson, Diehl, and others.
210. Seminar in Preventive Medicine and Public Health. Staff.

Division of Public Health Engineering and Sanitation

Professors Charles A. Mann, Ph.D., Harold A. Whittaker, B.A.; Associate Professors Theodore A. Olson, M.A., George O. Pierce, M.S., C.P.H.; Lecturers Harold S. Adams,* B.S., Herbert M. Bosch,* B.S., M.P.H., Jack J. Handy,¶ B.S., Samuel P. Kingston,* B.Ch.E., M.S., George S. Michaelson,* B.Ch.E., M.S., Harvey G. Rogers,* Dean M. Taylor,* B.Ch.E., Frank L. Woodward,* B.E.; Research Fellows Elizabeth K. Merner, B.A., Myrtle E. Rueger.

ELECTIVE COURSES

A4. Rural Sanitation. For subcollegiate students in School of Agriculture. 3 credits. Pierce.
102. Environmental Sanitation I. For engineers, doctors, and nurses. 3 credits. Olson and Pierce.
112. Water Supply Sanitation. For engineers. 4 credits. Olson and Pierce.
113. Sewage, Excreta, and Waste Disposal. For engineers. 4 credits. Olson, Pierce.
114. Environmental Sanitation II. For physicians, nurses, veterinarians, and others by arrangement. 2 credits. Whittaker, Olson, Pierce.
115. Food Sanitation. For engineers. 3 credits. Olson and Adams.
116. Public Health Engineering Administration. For engineers. 2 credits. Whittaker, Pierce, and special lecturers.
117-118. Sanitary Biology. Credits arranged. Olson.
119. Field Practice in Environmental Sanitation. Credits arranged. Whittaker, Pierce.
152. Industrial Hygiene Engineering. For engineers. 3 credits. Pierce.

Division of Public Health Nursing

Associate Professor Margaret S. Taylor, R.N., M.A.; Assistant Professors Jeanette Vroom, R.N., Ph.B., Alberta B. Wilson, R.N., M.A.; Instructor Wanyce C. Sandve, R.N., B.S.; Lecturers Ann Nyquist,* R.N., Mellie F. Palmer,¶ R.N., M.S., C.P.H.

* Member of staff of State Department of Health.
¶ Member of staff of Minneapolis City Health Department.

REQUIRED COURSES

62,63. Principles of Public Health Nursing. For public health nurses. 3 credits per quarter. Taylor, Wilson.

65.‡ Field Work in School Nursing. For public health nurses. Credits arranged. Vroom.

66.‡ Field Work in Rural Nursing. For public health nurses. Credits arranged. Vroom.

67.‡ Field Work in Family Health Agency. For public health nurses. Credits arranged. Vroom.

133. Mental Hygiene Aspects of Public Health Nursing. 3 credits. Clarke.

ELECTIVE COURSES

55. Nursing and Social Problems in Gonorrhea and Syphilis Control. For public health nurses and students in pre-social work. 2 credits. Taylor.

70. Practice Teaching in Home Nursing for Public Health Nurses. 6 credits. Vroom.

170. Supervision in Public Health Nursing. For public health nurses. 3 credits. Taylor.

171. Advanced Problems in Public Health Nursing. For public health nurses. Credits arranged. Taylor.

173.‡ Advanced Field Work in Public Health Nursing. For public health nurses. Credits arranged. Taylor.

174. Supervision Laboratory. For public health nurses. 2 credits. Taylor.

Division of Personal Health and Health Education

Professors Ruth E. Boynton, M.S., M.D., J. Arthur Myers, M.D., Ph.D.; Associate Professors Donald W. Cowan, M.D., M.S., Ruth E. Grout, Ph.D., M.P.H., Helen Starr, M.A., Stewart C. Thomson, M.S., M.D., M.P.H.; Assistant Professor Ramona L. Todd, Ph.D., M.D.; Instructors Murray B. Bates, M.S., M.D., Phillip D. Kernan, M.D., Frances E. Schaar, M.S., M.D.; Instructor Emeritus Hally J. Fisher, R.N.; Lecturers Donald A. Dukelow, M.S., M.D., Clare Gates,¶ Dr.P.H., William Griffiths,* M.A., Netta W. Wilson,* M.A.

REQUIRED COURSES

A1. Hygiene. Subcollegiate course in School of Agriculture. 1 credit. Bates.

A6. Family Care. Subcollegiate course in School of Agriculture. 3 credits. Vroom.

3. Personal Health. 2 credits. Thomson.

4. Health Problems of Adult Life. 2 credits. Thomson.

50. Public and Personal Health. 3 credits. Thomson.

51. Community Hygiene. 3 credits. Cowan.

52. Health Care of the Family. For home economics students. 3 credits. Todd, Sandve.

ELECTIVE COURSES

56. First Aid and Safety for Nurses. 3 credits. Schaar.

57. Health of Infant and Preschool Child. 2 credits. Boynton.

59. Health of the School Child. 3 credits. Grout and Thomson.

60. Tuberculosis and Its Control. 2 credits. Myers.

Ed.81. Introduction to Health Education. 3 credits. Grout.

125. Community Health Education. 3 credits. Grout.

* Member of staff of State Health Department.

‡ A fee of $1 per credit is charged for this course.

¶ Member of staff of Minneapolis City Health Department.

190. Field Work in Community Health Education Program. Credits arranged. Grout.
227. Problems in Community Health Education Program. Credits arranged. Grout.

Division of Biostatistics

Professor Alan E. Treloar, Ph.D.; Assistant Professor Marian W. Thornton, Ph.D.; Instructors Jean M. Hartman, B.A., Marjorie Ann Olson, M.A.

REQUIRED COURSES

90. Measurement in Medicine. Classification and measurement as descriptive methods in medicine; frequency proportions and probability; errors of random sampling and judgment of significance by statistical methods. For sophomore medical students only or special permission of instructor. 3 credits. Treloar.

ELECTIVE COURSES

80.‡ Elementary Vital Statistics. 3 credits. Treloar.
110. Biometric Principles. 3 credits. 111 to be taken concurrently. 3 credits. Treloar.
111.‡ Biometry Laboratory. 2 credits. Thornton and Hartman.
120. Correlation Analysis. 3 credits. Hartman.
121.‡ Correlation Laboratory. 2 credits. Hartman.
130. Random Sampling Distributions. 3 credits. Treloar and Thornton.
131.‡ Sampling Laboratory. 2 credits. Thornton.
140.‡ Vital Statistics. Credits arranged. Treloar.
150.‡ Life Tables. 3 credits. Treloar.
201. Topics in Biometry. Credits arranged. Treloar.
211. Seminar in Biometry. 1 credit. Treloar.

Laboratory of Physiological Hygiene

Professor Ancel Keys, Ph.D., Director; Associate Professors Austin F. Henschel, Ph.D., Olaf Mickelsen, Ph.D., Ernst Simonson, M.D.; Assistant Professors Josef M. Brozek, Ph.D., Carleton Chapman, M.D., M.P.H., Henry L. Taylor, Ph.D.

ELECTIVE COURSES

91.* Principles of Human Function. Primarily for students in Physical Education and Public Health. 4 credits. Henschel and Taylor.
92.* Principles of Human Function. Primarily for students in Physical Education and Public Health. 4 credits. Henschel and Brozek.
95. Principles of Human Nutrition. 3 credits. Keys.
191. Science of Human Nutrition. 3 credits. Keys.
192. Physiology of Exercise. 4 credits. Keys and staff.
194. Human Factors in Industry. 3 credits. Simonson and Brozek.
202. Nutrition in Public Health. 1 credit. Keys.
204. Tests and Measurements in the Appraisal of Human Physical Fitness. 1 credit. Henschel, Simonson, and Brozek.
206. Gerontology. 1 credit. Brozek and Taylor.
208. Human Adaptation in Health and Disease. 1 credit. Keys and staff.
220. Reading in Problems of Physiological Hygiene. Credits arranged. Keys and staff.

* Both quarters must be completed for credit except with special permission of instructor.
‡ A fee of $1 is charged for this course.

Hospital Administration

Professors James A. Hamilton, B.S., M.C.S., Director, Ray M. Amberg, Ph.C.; Associate Professor James W. Stephan, B.A., M.B.A.; Lecturers Nellie Gorgas, M.A., Madelyne Sturdavant.

ELECTIVE COURSES

153. The Hospital and the Community. 1 credit. Hamilton and Stephan.
161. History and Development of Hospitals. 5 credits. Hamilton and Stephan.
162. Principles of Organization and Management of Hospitals. 5 credits. Hamilton and Stephan.
163. Principles of Organization and Management of Hospitals. 5 credits. Hamilton and Stephan.
164. Principles of Organization and Management of Hospitals. 5 credits. Hamilton and Stephan.
165. Hospitals in Community Organization. 1 credit. Stephan.
166. Hospital Clerkship. 1 credit. Stephan.
167. Management Problems in Hospital Administration. 4 credits. Hamilton.
168. Orientation to Medical Sciences. 1 credit. Thomson.
169.‡ Administrative Residency. 9 credits. Stephan.

MEDICINE

Departmental Office, 221E University Hospitals
Cecil J. Watson, Professor and Head

Division of Internal Medicine

Professors Cecil J. Watson,* M.D., Ph.D., Head, Moses Barron, M.D., George E. Fahr,*¶ M.D., J. Arthur Myers, M.D., Ph.D., Wesley W. Spink,* M.D.; Professors Emeritus Henry L. Ulrich, M.D., S. Marx White, M.D.; Associate Professor George N. Aagaard,* M.D.; Clinical Associate Professors§ Karl W. Anderson, M.D., Archibald H. Beard,** M.D., John J. Boehrer, M.D., James B. Carey, M.D., Carl B. Drake, M.D., Richard V. Ebert, M.D., Alfred Hoff, M.D., Reuben A. Johnson, M.D., Arthur C. Kerkhof, M.D., Ph.D., Thomas Lowry, M.D., Donald McCarthy, M.D., Chauncey A. McKinlay, M.D., Samuel Nesbitt, M.D., Ph.D., Thomas A. Peppard, M.D., Ernest T. F. Richards,** M.D.C.M., Frederick H. K. Schaaf, M.D., Morse J. Shapiro, M.D., William B. Tucker, M.D., Myron M. Weaver,* M.D., Ph.D., Macnider Wetherby, M.D., Ragnvald S. Ylvisaker, M.D.; Assistant Professors Edmund B. Flink,*† M.D., Ph.D., Frederick W. Hoffbauer,* M.D., M.S., Evrel A. Larson,* M.D., Ph.D., Samuel Schwartz,* M.D.; Clinical Assistant Professors§ Reuben Berman, M.D., Jacob S. Blumenthal, M.D., Joseph L. Borg, M.D., John F. Briggs, M.D., Archibald E. Cardle, M.D., Carleton B. Chapman, M.D., M.P.H., Jay C. Davis, M.D., E. P. K. Fenger, M.D., Everett K. Geer, M.D., Wendell H. Hall, M.D., Douglas P. Head, M.D., Edgar T. Hermann, M.D., William H. Hollinshead, M.D., George X. Levitt, M.D., Ernest S. Mariette, M.D., Harold E. Miller, M.D., Johannes K. Moen, M.D., Robert I. Rizer,** M.D., Adam M. Smith, M.D., Horatio B. Sweetser, Jr., M.D.,

* Full-time appointment.
† On sabbatical leave.
‡ A fee of $100 is charged for this course.
¶ In charge at Minneapolis General Hospital.
§ Titles prefixed by "clinical" indicate appointments on a part-time basis.
** Inactive status.

Asher A. White, M.D., J. Allen Wilson, M.D., Ph.D., Herman J. Wolff, M.D., Ph.D., Thomas Ziskin, M.D.; Instructor Bergliot Hansen, B.S.; Clinical Instructors§ Harvey O. Beek, M.D., Craig W. Borden, M.D., Abraham I. Braude, M.D., Theodore J. Bulinski, M.D., David M. Craig, M.D., Charles R. Drake, M.D., Abraham Falk, M.D., Charles W. Fogarty, Jr., M.D., Robert A. Green, M.D., Paul S. Hagen, M.D., E. Russell Hayes, M.D., Ben I. Heller, M.D., John E. Holt, M.D., Howard L. Horns, M.D., Robert B. Howard, M.D., Wyman E. Jacobson, M.D., Norman P. Johnson, M.D., John W. LaBree, M.D., Russell C. Lindgren, M.D., Charles N. McCloud, M.D., M.S., John R. Meade, M.D., O. L. Norman Nelson, M.D., Elroy R. Peterson, M.D., Herbert F. R. Plass, M.D., Harold E. Richardson, M.D., L. Raymond Scherer, M.D., R. Norman Schneidman, M.D., William M. Schulze, M.D., Philip Soucheray, M.D., A. Boyd Thomes, M.D., Russell M. Wilder, Jr., M.D., Ph.D.; Clinical Assistants§ Robert J. Brotchner, M.D., Dale H. Correa, M.D., John A. Dahl, M.D., Wayne S. Hagen, M.D., Dean K. Rizer, M.D., George C. Roth, M.D., Clarence Siegel, M.D.; Research Associate Albert J. Greenberg, M.D., M.S.; Research Fellows Howard M. Wikoff, M.D., Ellard M. Yow, M.D., Catherine Evertz, M.S.

REQUIRED COURSES

18-19. Principles of Medical and Surgical Nursing.

101. Physical Diagnosis. Lectures and practical work on the examination of the normal body and on various aspects of physical diagnosis in disease. Students are assigned to hospital wards for the examination of selected cases. Sophomore year. Prerequisites, Anatomy 100, Physiology 106. 44 hours; 3 credits. Watson and staff.

104. Introduction to Internal Medicine. Systematic lectures and clinics in the field of internal medicine. Junior year. Prerequisite, Medicine 101, 102. 22 hours a quarter, 66 hours total; 6 credits. Watson and staff.

110. Medicine Clinic. One hour per week one quarter of the senior year. Watson, Barron, and others.

111. Clinical Clerkship in Medicine. Individual work in the medical wards of the University Hospitals, taking and recording of case histories, making of physical examinations and carrying out assigned laboratory work. Clerks are held responsible for history and course of disease as well as a detailed knowledge of the treatment given to patients assigned them. Junior year. Prerequisites, clear record in all prior subjects. 260 hours; 6 credits. Watson and staff.

111x. Same as Course 111 at the Minneapolis General Hospital. Fahr and staff.

112. Senior Clerkship in Internal Medicine (Admissions). Supervised study of new cases in the Outpatient Medical Clinic. Rotation through special clinics including cardiology, gastrointestinal diseases, chest diseases, diabetes, metabolism and endocrinology, hematology, allergy, rheumatoid diseases, peripheral vascular disease, and gastroscopy. 260 hours; 6 credits. Flink, Hayes, and others.

ELECTIVE COURSES

129. Advanced Physical Diagnosis. Prerequisite, Medicine 101. Juniors. Not less than 3 nor more than 6 students. Minneapolis General Hospital. Peppard.

132. Diagnosis and Treatment of Diseases of the Lungs. Three lectures and two clinics per week (hospital wards and dispensary). Lectures with or without hospital work. Sophomores, juniors, and seniors. Hours and credits arranged. Myers.

§ Titles prefixed by "clinical" indicate appointments on a part-time basis.

133. Gastroenterology. Clinic demonstration and discussions of disorders of the gastrointestinal tract. Junior and senior years. 4 to 8 students. Carey.

135. Essentials of Diagnosis and Treatment of Heart Disease. Practical clinics on cardiac patients. Junior and senior years. Limited to 8 students. Shapiro.

136. The Respiratory Organs in Health and Disease. One or more quarters.

139. Clinical Electrocardiography. Juniors and seniors. Hours and credits arranged. Minneapolis General Hospital. Kerkhof.

COURSES FOR GRADUATE STUDENTS

201. Clinical Medicine. Watson, Barron, Fahr, and Spink.

202. Diseases of the Cardiovascular Apparatus. Fahr.

203. Research in Medicine. Watson, Fahr, and Spink.

205. Tuberculosis. Myers.

206. Clinical Conference. Weekly meeting on Friday at 9 a.m. Presentation of problem cases. Discussion of diagnosis and treatment and consideration of pertinent literature. 1 cred. Watson and staff.

207. Clinical Pathological Conference. Weekly meeting on Wednesday at 11 a.m. Presentation of clinical features, necropsy findings, and discussion. Medical and surgical cases. 1 credit. Bell, Wangensteen, Watson, and staff.

208. Clinical Radiological Conference. Weekly meeting on Monday at 9 a.m. Presentation and discussion of X-ray films from the medical service, with clinical correlation. 1 credit. Rigler, Watson, and staff.

209. Psychosomatic Medicine. One hour weekly. Hastings.

210. Infectious Disease Seminar. One hour weekly. Spink.

211. Electrocardiographic Conference. One hour weekly. Aagaard.

For other courses see *Graduate Medical School Bulletin.*

Prof Emeritus 1952

Division of Dermatology

Professors Henry E. Michelson, M.D., Director, Francis W. Lynch, M.D., M.S., Carl W. Laymon, M.D., Ph.D.; Professor Emeritus Samuel E. Sweitzer, M.D.; Clinical Associate Professors Stephan Epstein, M.D., Harry G. Irvine, M.D., John F. Madden, M.D., M.S.; Clinical Assistant Professors Harry A. Cumming, M.D., Elmer M. Rusten, M.D.; Clinical Assistant Professor Emeritus Charles D. Freeman, M.D.; Clinical Instructors Clifton A. Boreen, M.D., Elmer T. Ceder, M.D., Isadore Fisher, M.D., Henry N. Klein, M.D., Orville E. Ockuly, M.D., M.S.; ~~Clinical Assistants Lyndon King, Jr., M.D., Sam M. Mackoff, M.D.~~

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REQUIRED COURSES

123. Dermatology and Syphilology. Clinical lectures upon the common skin diseases and syphilis, including diagnosis and treatment. Senior year. Prerequisites, Medicine 101, 102. 33 hours; 3 credits. Michelson.

124. Senior Clerkship in Dermatology. Sections of the senior class in dermatology and syphilis, in the dispensary at the University Hospitals. 90 hours; 2 credits. Michelson and staff.

124x. Part of Course 124 at the Minneapolis General Hospital. Laymon, Cumming, and staff.

ELECTIVE COURSES

157. Ward Clinics in Dermatology. Junior year. 17 hours. Ancker Hospital, St. Paul. Lynch, Madden, and Klein.

158. Clinic in Dermatology. Wilder Dispensary. Klein.

159. Assistantship, Dermatology and Syphilis. Prerequisite, junior medical clerkship. Limited to one student. Minneapolis General Hospital. Laymon.

160. Assistantship and Conference in Dermatology. Prerequisite, junior medical clerkship. Limited to one student. University Hospitals and Dispensary. Michelson and staff.

161. Assistantship in Dermatology. Prerequisite, Medicine 124. Limited to 2 students. University Dispensary. Michelson and staff.

162. Assistantship in Dermatology. Prerequisite, Medicine 124. Limited to 2 students. Minneapolis General Hospital. Laymon.

163. Treatment of Syphilis. Limited to 2 students. University Dispensary. Michelson.

164. Seminar in Pathology. Histopathology of the skin. Clinical and pathologic phases will be exemplified. Prerequisite, Pathology 102. Michelson.

165. Seminar in Dermatology. Hours arranged. Michelson and others.

166. Allergy and Dermatology. Limited to 1 student. Hours and credits arranged. Rusten and Epstein.

COURSES FOR GRADUATE STUDENTS

225. Clinical Dermatology and Syphilology. Michelson and staff.

226. Clinical Dermatology and Syphilology. Laymon and staff.

227. Histopathology of the Skin. Michelson and staff.

228. Research in Dermatology and Syphilology. Michelson and staff.

Division of Clinical Laboratory Medicine

Professor Gerald T. Evans,* M.D.C.M., Ph.D., Director of Laboratories, University Hospitals; Assistant Professor Evrel A. Larson,* M.D., Ph.D.

REQUIRED COURSES

102. Clinical Laboratory Medicine. Methods of laboratory examination for diagnostic purposes. Sophomore year. Prerequisites, Physiological Chemistry 100, students must have completed or be taking Pathology 101. 66 hours; 5 credits. Evans, Watson, and staff.

COURSES FOR GRADUATE STUDENTS

235. Advanced Clinical Laboratory Medicine. Evans and staff.

236. Research on Clinical Laboratory Problems. Evans and staff.

* Full-time appointment

PSYCHIATRY AND NEUROLOGY

Departmental Office, 126 Millard Hall
Donald W. Hastings,* M.D., Professor and Head

Division of Psychiatry

Professors Donald W. Hastings,* M.D., Starke R. Hathaway,* Ph.D., Burtrum C. Schiele,* M.D.; Professor Emeritus J. C. McKinley, M.D., Ph.D.; Clinical Professors§ Eric K. Clarke, M.D., Ernest M. Hammes, M.D., Hyman S. Lippman, M.D., Ph.D.; Associate Professors Robert G. Hinckley,* M.D., Roger W. Howell,* M.D., Reynold A. Jensen,* M.D., Paul E. Meehl,* Ph.D.; Clinical Associate Professors§ S. Alan Challman, M.D., Alexander G. Dumas, M.D., Adelaide M. Johnson, M.D., Gordon R. Kamman, M.D., Joseph C. Michael, M.D., Marvin Sukov, M.D.; Assistant Professor C. Knight Aldrich,* M.D., William Schofield,* Ph.D.; Clinical Assistant Professors§ Walter A. Carley, M.D., Clifford O. Erickson, M.D., Hewitt B. Hannah, M.D., Harold B. Hanson, M.D., Werner Simon, M.D.; Instructors Frank Kiesler, Jr.,* M.D., Mottram Torre,* M.D.; Clinical Instructors§ George M. Cowan, M.D., Burton P. Grimes, M.D., Joel C. Hultcrans, M.D.

ELECTIVE COURSES FOR NONMEDICAL STUDENTS

70. Introductory Psychiatry (Social Work 235). For upper group only. Prerequisites, elementary psychology and sociology. Hours arranged; 3 credits. Hinckley.
171. Descriptive Psychiatry and Neurology (Social Work 237). Prerequisites, Course 70 or Psychology 144-145. Hours arranged; 3 credits. Hastings, Aldrich, and Chalgren.

REQUIRED COURSES FOR MEDICAL STUDENTS

102. Psychiatry. Special topics and their clinical application. Junior year. 1 credit. Hathaway.
103. Junior Clinical Clerkship in Psychiatry and Neurology—Didactic. Sections of the class for ten-week periods in the University Hospitals. 44 hours; 2 credits. Hastings and staff.
103x. Junior Clinical Clerkship in Psychiatry and Neurology—Clinical. Sections of the class for ten-week periods in the University Hospitals. 216 hours; 4 credits. Hastings and staff.
105. Psychiatric and Neurologic Clinic. Senior year. Hours arranged; 1 credit. Hastings, Baker, and staff.
120. Psychosomatics. Freshman year. 3 credits per year. Hastings.
121. Introduction to Psychiatry in the Practice of Medicine. Sophomore year. 3 credits per year. Schiele.

ELECTIVE COURSES FOR MEDICAL STUDENTS

145. Reading in Psychiatry. The student will be assigned a special reading topic. Credits and hours arranged. Hastings and staff.

* Full-time appointment.
§ Titles prefixed by "clinical" indicate appointments on a part-time basis.

146. Psychiatric Problems in General Medical Practice (including the psychoneuroses). Junior year. Not less than five students. University Hospitals. Hours and credits arranged. Schiele.

COURSES FOR GRADUATE STUDENTS

208x. Clinical Psychiatry. Hastings and staff.

208y. Clinical Child Psychiatry. Jensen.

209. Research in Psychiatry. Hastings and staff.

213. Orientation in Psychiatric Social Service.

214. Psychiatric and Neurologic Disorders of Childhood. Jensen.

215. Seminar in the Application of Psychological Methods. Hours and credits arranged. Hathaway.

216. Psychiatric and Neurologic Case Conference. Hours and credits arranged. Hastings and staff.

219. Personality Structure, Normal and Abnormal. Schiele and Hathaway.

221. Psychometric Clerkship. Psychological testing of inpatient and outpatient cases in the University Hospitals. Hours and credits arranged. Hathaway, Meehl, and Schofield.

222. Interviewing Techniques in Psychiatry. Schiele and Hathaway.

227. Clinical Seminar for Psychologists. Registration by permission of instructor. Hours arranged; 1 credit. Schiele and Schofield.

236. Normal Personality Development and Psychopathology. Johnson.

237. Psychoanalytic Therapy. Lippman.

Division of Neurology

Professor A. B. Baker,* M.D., Ph.D., Director; Professor Emeritus J. C. McKinley, M.D., Ph.D.; Clinical Professor§ Ernest M. Hammes, M.D.; Clinical Associate Professors§ Joe R. Brown, M.D., Royal C. Gray, M.D., Ph.D., Harold H. Noran, M.D., Ph.D., Robert L. Meller, M.D.; Clinical Assistant Professors§ Philip K. Arzt, M.D., Nathan J. Berkwitz, M.D., Ph.D., Walter P. Gardner, M.D.; Instructors William S. Chalgren,* M.D., David D. Daly,* M.D., Fae Y. Tichy,* M.D.; Clinical Instructors§ Harold Buchstein, M.D., Ernest M. Hammes, Jr., M.D., Andrew J. Leemhuis, M.D., Zondal R. Miller, M.D., Joseph A. Resch, M.D., V. Richard Zarling, M.D.; Professorial Lecturer Ralph Rossen, M.D.

REQUIRED COURSES FOR MEDICAL STUDENTS

101. Neurology. Systematic clinics, demonstrations, and lectures. Junior year; 2 credits. Baker and staff.

103. Junior Clinical Clerkship in Psychiatry and Neurology—Didactic. Sections of the class for ten-week periods in the University Hospitals. 44 hours; 2 credits. Baker and staff.

103x. Junior Clinical Clerkship in Psychiatry and Neurology—Clinical. Sections of the class for ten-week periods in the University Hospitals. 216 hours; 4 credits. Baker and staff.

105. Psychiatric and Neurologic Clinic. Senior year. Hours arranged; no credit. Hastings, Baker, and staff.

* Full-time appointment.

§ Titles prefixed by "clinical" indicate appointments on a part-time basis.

ELECTIVE COURSES FOR MEDICAL STUDENTS

143. Problems in Neuropathology. (Same as Pathology 115.) Individual gross and microscopic studies on existing preparations in neuropathology. Prerequisites, Pathology 101 and 102. Hours and credits arranged. Baker and staff.

145x. Reading in Neurology. The student will be assigned a special reading topic. Hours and credits arranged. Baker and staff.

150. Advanced Neuropathology. Same as Course 210 in Graduate School. Hours and credits arranged. Noran and Tichy.

151. Survey of Neuropathology. (Same as Pathology 117.) Same as Course 212 in the Graduate School. Hours and credits arranged. Noran and Tichy.

COURSES FOR GRADUATE STUDENTS

208. Clinical Neurology. Hours and credits arranged. Baker and staff.

209. Research in Neurology. Hours and credits arranged. Baker and staff.

210. Advanced Neuropathology. Hours and credits arranged. Noran and Tichy.

211. Intracranial Neoplasms. (Same as Pathology 116.) Hours and credits arranged. Baker.

212. Survey of Neuropathology. Credits and hours arranged. Noran and Tichy.

216. Psychiatric and Neurologic Case Conference. Hours and credits arranged. Baker and staff.

220. Advanced Clinical Neurology. Selected readings and comprehensive review of specialized subjects in the neurological field. Hours and credits arranged. Baker and staff.

225. Neuro-ophthalmology. Series of lectures covering the field of ophthalmology as related to neurology. Hours arranged; 2 credits. Baker, Hanson, and Brown.

226. Neurological-neurosurgical Conference. (Same as Surgery 318 and Radiology 163A.) Review of X-rays, case histories, and neuropathological material on neurological and neurosurgical cases. Hours arranged; 1 credit. Peterson, Peyton, and Baker.

228. Research in Neuropathology. Hours and credits arranged. Baker and Noran.

229. Clinical Neurophysiology. A review of the neurophysiological concepts that have clinical application. Hours and credits arranged.

230. Electroencephalography. Hours and credits arranged. Zarling.

231. Applied Electroencephalography and Myography. Practical experience in the reading and interpretation of electroencephalographic tracings. Hours and credits arranged. Arzt and Zarling.

232. Applied Neuroroentgenology. Experience in the actual reading of neuroroentgenological films. Hours and credits arranged. Peterson.

233. Applied Neuropathology. Hours and credits arranged. Noran and Tichy.

234. History of Neurology. Hours and credits arranged. Brown.

235. Neurology in Other Medical Specialties. Hours and credits arranged. Chalgren.

238. Neurological Clinical Pathological Conference. Hours arranged; 1 credit. Baker and staff.

239. Neuroanatomy. Hours arranged; 1 credit. Baker and staff.

240. Neuropathology Conference. Hours arranged; 1 credit. Baker.

OBSTETRICS AND GYNECOLOGY

Departmental Office, 435M University Hospitals
John L. McKelvey, Professor and Head

Professor John L. McKelvey,* M.D.C.M., Head; Associate Professor Emeritus Arthur E. Benjamin, M.D.; Clinical Assistant Professors§ Lee W. Barry, M.D., Ph.D., Claude J. Ehrenberg, M.D., Everett C. Hartley, M.D., George E. Hudson, M.D., Leonard A. Lang,¶ M.D., Rae T. La Vake, M.D., Clarence O. Maland, M.D., Jalmer H. Simons, M.D., Samuel B. Solhaug, M.D., Ph.D., Roy E. Swanson, M.D., Ph.D., Herbert M. N. Wynne, M.D.; Instructors Titus P. Bellville, M.D., Donald W. Freeman, M.D., Roy G. Holly, M.D., Mancel T. Mitchell, M.D.; Clinical Instructors§ Milton Abramson, M.D., Ph.D., Duma C. Arnold, M.D., Joseph F. Bicek, M.D., Ray F. Cochran, M.D., Louis Friedman, M.D., Joseph Goldsmith, M.D., John A. Haugen, M.D., Albert F. Hayes, M.D., Eugene M. Kasper, M.D., Ph.D., Arthur A. H. Koepsell, M.D., Harold R. Leland, M.D., Edward C. Maeder, M.D., Ph.D., Charles E. Proshek, M.D., Owen F. Robbins, M.D., William P. Sadler, M.D., Melvin B. Sinykin, M.D., Rodney F. Sturley, M.D., James J. Swendson, M.D., Thurston W. Weum, M.D.; Clinical Assistants§ Paul N. Larson, M.D., Charles H. McKenzie, M.D.

REQUIRED COURSES

1. Obstetrical Nursing. For student nurses. McKelvey and others.
2. Gynecological Nursing. For student nurses. McKelvey and others.

120. Obstetrics. The physiology of pregnancy, labor, and the puerperium. For senior medical students. 11 hours; 1 credit. McKelvey, Lund, Rogers, and staff.

121. Obstetrics. The pathology of pregnancy, labor, and the puerperium. For senior medical students. Prerequisite, Course 120. 11 hours; 1 credit. McKelvey, Lund, Rogers, and staff.

123. Gynecology. A study of diagnostic methods in diseases of women. For senior medical students. 22 hours; 2 credits. McKelvey, Lund, Rogers, and staff.

124. Introduction to Obstetrics and Gynecology. For medical students in the last quarter of the junior year. 18 hours; 2 credits. McKelvey, Lund, Rogers, and staff.

135. Clinical Clerkship in Obstetrics and Gynecology. Includes clinics in obstetrics and gynecology in the University Hospitals and Dispensary. 260 hours; 6 credits. McKelvey, Lund, Rogers, and staff.

135x. Part of Course 135 at the Minneapolis General Hospital. Lang and staff.

COURSES FOR GRADUATE STUDENTS

201-202-203-204. Advanced Obstetrics and Gynecology. Part I. Required of first year fellows. McKelvey, Lang, and associates.

205-206-207-208. Advanced Obstetrics and Gynecology. Part II. Required of second year fellows. McKelvey, Lang, and associates.

209-210-211-212. Advanced Obstetrics and Gynecology. Part III. Third year fellows. McKelvey, Lang, and associates.

216-217-218-219. Research. Staff.

* Full-time appointment.
§ Titles prefixed by "clinical" indicate appointments on a part-time basis, except as noted.
¶ In charge at Minneapolis General Hospital.

OPHTHALMOLOGY AND OTOLARYNGOLOGY

Departmental Office, 534E Todd Memorial Hospital
Lawrence R. Boies, Professor and Head

Division of Ophthalmology

Clinical Professor Erling W. Hansen, M.D., Director; Professor Emeritus Frank E. Burch, M.D.; Clinical Associate Professor Hendrie W. Grant, M.D., M.S.; Clinical Assistant Professors Edward P. Burch, M.D., Walter E. Camp, M.A., M.D., Walter L. Hoffman, M.D., M.S., Charles Hymes, M.D., M.S., Richard O. Leavenworth, M.D., Virgil J. Schwartz, M.D., Charles Stanford, M.D.; Clinical Assistant Professor and Refractionist Robert R. Tracht, M.D., M.S.; Clinical Instructors Thomas J. Edwards, M.D., Walter H. Fink, M.D., M.S., Walter K. Haven, M.D., M.S., Richard C. Horns, M.D., M.S., Vernon L. Lindberg, M.D., Karl E. Sandt, M.D., Gordon E. Strate, M.D., Francis M. Walsh, M.D., M.S.; Clinical Assistants Frank Adair, M.D., Wilfred J. Bushard, M.D., Bourne Jerome, M.D., R. L. Schmidtke, M.D., M.S.

REQUIRED COURSES

100. Ophthalmology. Lectures and demonstrations. For senior medical students. 2 credits. Hansen and staff.
106. Clerkship in Diseases of the Eye. Diagnosis and treatment of cases. 45 hours; 2 credits. Hoffman, Stanford, Horns, and Bushard.

ELECTIVE COURSES

121. Operative Clinic in Eye. 13 hours. Limited to 6 students. University Hospitals. Hansen, Hymes, Hoffman.
122. Medical and Neurological Ophthalmology. 2 sections. 22 hours; 2 credits. Limited to 8 students per section. Todd Memorial Room. Schwartz and Lindberg.
123. Advanced Ophthalmology. Prerequisite, Course 122; 22 hours; 2 credits. Limited to 6 students. University Dispensary. Eye Clinic. Stanford.

COURSES FOR GRADUATE STUDENTS

200. Refraction. Tracht.
201. Advanced Refraction. Tracht.
202. Clinical Ophthalmology. Hansen, Hymes, Hoffman, and Stanford.
203. Biomicroscopy. E. P. Burch.
204. Ocular Muscles. Grant and Horns.
205. Perimetry. Schmidtke.
206. Surgery of the Eye. Hansen and Hymes.
207. Pathology of the Eye. Walsh.
208. Ophthalmoscopy. Schwartz, Lindberg, and Horns.
209. Neuro-ophthalmoscopy. E. P. Burch.
211. Physiology of Vision and Physiological Optics. Jerome.
212. Seminar in Ophthalmology. Hansen and staff.
213. Review of Texts on External Diseases. Stanford.
214. Histology of the Eye. Walsh.
215. Radiology of the Eye, Orbit, and of the Head. Peterson.

217. Allergy of the Eye. Hansen.
218. Ophthalmic Therapeutics. Horns.
219. History of Ophthalmology. Hansen.

Division of Otolaryngology and Oral Surgery

Clinical Professors Lawrence R. Boies, M.A., M.D., Director, Henry B. Clark, Jr., D.D.S., M.D., Anderson C. Hilding, M.D., Ph.D.; Professorial Lecturer Carl W. Waldron, M.D., D.D.S.; Clinical Associate Professors Charles E. Connor, M.A., M.D., Kenneth A. Phelps, M.D.; Clinical Assistant Professors Henry V. Hanson, M.D., Jerome A. Hilger, M.D., M.S., John J. Hochfilzer, M.D., Robert E. Priest, M.D., M.S., George M. Tangen, M.D., M.S.; Clinical Instructors C. Alford Fjeldstad, M.D., Neill F. Goltz, M.D., Conrad Holmberg, M.D., L. T. Simons, M.D.

REQUIRED COURSES

101. Otology. Lectures and Demonstrations. Senior medical students. 1 credit. Boies and staff.
102. Rhinology. Lectures and demonstrations. Senior medical students. 1 credit. Boies and staff.
103. Laryngology. Lectures and demonstrations. Senior medical students. 1 credit. Boies and staff.
104. Clinic and Conferences in Diseases of the Ear. Diagnosis and treatment of cases. 45 hours; 2 credits. University Dispensary. Boies, Connor, Hochfilzer, Hilger, Holmberg, Priest, and Tangen.
105. Clinic and Conferences in Diseases of the Nose and Throat. Diagnosis and treatment of cases. 45 hours; 2 credits. University Dispensary. Boies, Connor, Hochfilzer, Hilger, Holmberg, Priest, and Tangen.

COURSES PRIMARILY FOR GRADUATE STUDENTS

230. Clinical Otology. 132 hours per quarter. Staff.
231. Clinical Rhinology and Laryngology. 132 hours per quarter. Staff.
232. Surgery of the Ear, Nose, and Throat. Operative clinic in the University Hospitals. 32 hours per quarter. Staff.
233. Operative Surgery of the Temporal Bone. 22 hours.
234. Operative Surgery of the Nose and Throat. 22 hours.
235. Roentgenology of the Head. 11 hours. Rigler.
236. Functional Ear Tests. 11 hours.
237. Endoscopy. Lectures and demonstrations. 22 hours.
238. Pathology of the Ear, Nose, and Throat. 22 hours. Connor and Hilger.
239. Neurologic Lesions in the Field of Otolaryngology. 6 hours. Baker.
240. Physiotherapy and Surgery of Malignant Diseases of the Ear, Nose, and Throat. 6 hours. Boies, Hilger, and Stenstrom.
241. Seminar in Otolaryngology. Weekly.
242. Applied Physiology in Otolaryngology. 6 hours.
243. Applied Pharmacology in Otolaryngology. 6 hours.
244. Speech Pathology. 6 hours. Bryngelson.
245. Allergy. 11 hours.
246. Practical Acoustics for Otologists. 6 hours. Hartig.
247. Plastic Surgery of the Nose. 11 hours. Waldron, Hochfilzer, and Tangen.

PEDIATRICS

Departmental Office, 205W Eustis Hospital
Irvine McQuarrie, Professor and Head

Professor Irvine McQuarrie,* Ph.D., M.D., Head; Clinical Professor Emeritus Walter Ramsey, M.D.; Clinical Professors Bryng Bryngelson, Ph.D., Edgar J. Huenekens, M.A., M.D., Hyman S. Lippman, M.D., Ph.D., Erling S. Platou, M.D., Frederick C. Rodda, M.D., Max Seham, M.D., Albert V. Stoesser, M.D., Ph.D.; Associate Professors* John M. Adams, M.D., Ph.D., Reynold Jensen, M.D., Charles D. May, M.D.; Clinical Associate Professors Edward Dyer Anderson, M.D., Joseph T. Cohen, D.D.S., Paul F. Dwan, M.D., L. F. Richdorf, M.D., Ph.D., Morse J. Shapiro, M.D., Robert L. Wilder, M.D.; Assistant Professors James F. Bosma,* M.D., Mildred R. Ziegler, Ph.D.; Clinical Assistant Professors Northrop Beach, M.D., Woodard Colby, M.D., Lyman R. Critchfield, M.D., Harold B. Hanson, M.D., Frank G. Hedenstrom, M.D., Alan J. Hill, M.D., Emanuel S. Lippman, M.D., Lillian Nye, M.D., Theodore C. Papermaster, M.D., Alfred J. Ouellette, M.D., Edwin F. Robb, M.D., Robert Rosenthal, M.D., W. Ray Shannon, M.S., M.D., David M. Siperstein, M.A., M.D., Alexander R. Stewart, M.D.C.M., Willis H. Thompson, M.D.; Instructors* Audrey Arkola, M.A., Joseph Carpentieri, M.D.; Clinical Instructors Stuart L. Arey, M.D., Alice K. Brill, M.D., Harold F. Flanagan, M.D., Aaron Friedell, M.D., Alice Fuller, M.D., Hermina Hartig, M.D., Evelyn V. Johnson, M.D., Arthur E. Karlstrom, M.D., Elizabeth Lowry, M.D., Everett C. Perlman, M.D., Eva Shaperman, M.D., Ellsworth Stenswick, B.S., Richard Tudor, M.D.; Clinical Assistants Edwin C. Burklund, M.D., Lawrence F. Erickson, M.D., Robert W. Gibbs, M.D., Sidney S. Scherling, M.D., Albert J. Schroeder, M.D., Edward L. Strem, M.D., John Dudley Tobin, M.D.; Research Associates Rudolf Engel, M.D., Robert Salmon, M.Sc.; Research Fellows* Forrest H. Adams, M.D., M.S., Robert Aldrich, M.D., Robert A. Good, M.D., Ph.D., Vincent Kelley, M.D., Ph.D., Charles U. Lowe, M.D.

REQUIRED JUNIOR COURSES

120. The Normal Child. (a) Physical growth and development. Bosma. (b) Psychological development. Arkola. (c) Physiology and metabolism of infancy and childhood. 11 hours; 1 credit. McQuarrie, May, and Ziegler.
121. Clinical Diagnosis in Infancy and Childhood. The pathogenesis of all diseases and disorders of childhood, their recognition and classification, including the disturbances of speech, psychiatric disorders, dental diagnosis, and indications for orthodontia. Follows Course 120. 11 hours; 1 credit. McQuarrie, Adams, Bosma, Bryngelson, Cohen, Jensen, and May.
122. Diseases of Infancy and Childhood and Their Treatment. Emphasis is placed on the diseases which are more or less peculiar to the age periods before the sixteenth year. Follows Course 121. 22 hours; 2 credits. McQuarrie, Adams, Jensen, May, Stoesser, and senior staff.
123. Divisional Demonstration Clinic on Noncontagious Diseases. One quarter for each student. (Part of Course 124.) 17 hours. Minneapolis General Hospital. Huenekens and Seham.

* Full-time appointment.

124. Junior Clinical Clerkship in Pediatrics. Patients in the wards are assigned to individual students for examination, treatment, and "follow-up" observation under supervision. Each student has five weeks at University Hospitals and five weeks at Minneapolis General Hospital. 260 hours; 6 credits. McQuarrie, Adams, Jensen, Stoesser, May, Bosma, and junior staff.
130. Divisional Demonstration Clinic on Contagious Diseases. One quarter for each student. (Part of Course 124.) 11 hours. Minneapolis General Hospital and Ancker Hospital. Stoesser and clinical staff.

REQUIRED SENIOR COURSES

135. Senior Clinical Clerkship in Pediatrics. Patients in dispensaries are assigned to individual students for examination, and "follow-up" observation under supervision. Special clinics in well-baby care, allergy, heart, metabolism, and child psychiatry are attended each week. One sixth of class on pediatric clerkship at one time—one half assigned to the University Hospitals, the other half to the Minneapolis General Hospital. 108 hours; 3 credits. McQuarrie, Adams, Bosma, Jensen, May, Stoesser, and staff.

ELECTIVE COURSES

150.¶ Physiology and Diseases of the Newborn. Adams and May.
152.¶ Fundamental Principles of Nutrition and Metabolism as Applied to Children. Seminar course. McQuarrie, May, and Ziegler.
154.¶ Endocrinology as Applied to Pediatrics. Seminar course. McQuarrie.
156.¶ Advanced Study of Noncontagious Diseases. Both clinical and experimental subject matter included. Adams, May, and Bosma.
158.¶ Advanced Study of Contagious Diseases. Stoesser, Bosma, and Hill.
160. Allergic Disorders in Childhood. Stoesser.
162. Common Behavior Disturbances in Childhood. Their recognition and management. Jensen, H. S. Lippman, and Hanson.
166. Weekly Seminar for Detailed Discussion of Fundamental Subjects Related to Pediatrics. McQuarrie, Ziegler, and staff.
168. Speech Disturbances in Childhood. Clinic course. Bryngelson, Stenswick, and Jensen.
170. Rheumatic Infection and Heart Diseases in Childhood. Adams, Dwan, and Shapiro.
172. Dental Disorders in Relation to General Health. Cohen.

COURSES FOR GRADUATE STUDENTS

200. Graduate Seminar in Pediatrics. 17 hours; 1½ credits per quarter. McQuarrie and senior clinical staff.
202. Pediatric Clinic. Outpatient Department, University Hospitals. Daily, 9:00-12:00 noon. Adams, Jensen, and May.
204. Three month's residence in pediatrics at the University Hospitals. McQuarrie, Adams, Jensen, and May.
206. Three month's residence in pediatrics at the Minneapolis General Hospital. Huenekens, Platou, Richdorf, Seham, Stoesser, and Bosma.
208. Pediatric Research. Special problems. Students may collaborate with members of the staff or with other students. McQuarrie, Ziegler, Adams, May, and Jensen.
210. Special Clinics in Pediatrics. Adams, Jensen, May, Dwan, and Stoesser.

¶ Not offered to less than 10 students.

RADIOLOGY AND PHYSICAL MEDICINE

Departmental Office, M534 University Hospitals
Leo G. Rigler, Professor and Head

Division of Radiology

Professors Leo G. Rigler,* M.D., Head, K. Wilhelm Stenstrom,* Ph.D.; Clinical Associate Professors Harold O. Peterson, M.D., Walter H. Ude, M.D.; Assistant Professor Herbert W. Stauffer,* M.D.; Clinical Assistant Professors J. Richards Aurelius, M.D., Solveig M. Bergh, M.D., Chauncey N. Borman, M.D., Daniel L. Fink, M.D., Cyrus Owen Hansen, M.D., Malcolm B. Hanson, M.D., Oscar Lipschultz, M.D., Russell Morse, M.D., Edward Schons, M.D.; Instructor James F. Marvin,* M.S.; Clinical Instructors Frank R. Gratzek, M.D., Gjert M. Kelby, M.D., John P. Medelman, M.D., Thomas B. Merner, M.D., Harry Mixer, M.D., Leo A. Nash, M.D., Ames Naslund, M.D., Bernard O'Loughlin, M.D., Francis Ruzicka, M.D.

REQUIRED COURSES

103a. Neuroradiology for Neuropsychiatric Clerks. Part of Neuropsychiatry 103. 6 hours. Stauffer.

107. Biophysics. Lectures and demonstrations. For sophomore medical students. 12 hours; 1 credit. Stenstrom.

111a. Medical Roentgenologic Conference for Medical Clerks. Part of Medicine 111. 11 hours. Rigler.

112a. Roentgen Diagnostic Clinic for Medical Clerks. Part of Medicine 112. 11 hours. Stauffer.

121. Roentgen Diagnosis and Radiation Therapy. Lectures and demonstrations. For junior medical students. 44 hours; 4 credits. Rigler and Stenstrom.

124a. Pediatric-Roentgenologic Conference for Pediatrics Clerks. Part of Pediatrics 124. 11 hours. Rigler.

126. Clinical Lectures in Roentgen Diagnosis and Therapy. For senior medical students. Prerequisite Radiology 121. 1 credit. Rigler and Stenstrom.

127. Fluoroscopy of the Thorax. For senior medical students in sections. 12 hours; 1 credit. Rigler, Stauffer, and staff.

135d. Surgical Roentgenologic Conference for Surgical Clerks. Part of Surgery 135. 11 hours. Stauffer.

135x. Radiation Therapy for Surgical Clerks. Part of Surgery 135. 3 hours. Stenstrom.

163a. Neurosurgical-Roentgenologic Conference for Neurosurgical Clerks. Part of Surgery 163. 11 hours; 1 credit. Peterson and Peyton.

ELECTIVE COURSES

104. Roentgen and Radium Therapy. Junior, senior, and graduate students. 11 hours. Stenstrom.

185. Interpretation of Roentgenograms. Senior year. Prerequisite Radiology 121; 22 hours. Rigler and Stauffer.

186.† Roentgen Technique. Junior or senior year. 22 hours. Nash.

187a.† Roentgen Anatomy of Bones and Joints. Same as Anatomy 148. Prerequisites, Anatomy 100 and 101. 11 hours. Borman.

* Full-time appointment.

† Not offered to fewer than ten students.

187b.† Roentgen Anatomy of Viscera. Prerequisites, Anatomy 100 and 101. 11 hours. O'Loughlin.

188a.† Roentgen Diagnosis of Diseases of Bones and Joints. 11 hours. C. O. Hansen.

188b.† Roentgen Diagnosis of Diseases of Thorax. 11 hours. Kelby.

188c.† Roentgen Diagnosis of Diseases of Abdominal Viscera. 11 hours. Fink.

188d.† Roentgen Diagnosis of Diseases of the Gastrointestinal Tract. 11 hours. Naslund.

189a.† Clinic in X-ray Diagnosis. 11 hours. University Hospitals. O'Loughlin.

189b.† Clinic in X-ray Diagnosis. 11 hours. Minneapolis General Hospital. Lipschultz.

190.† Roentgen Diagnosis of the Head and Neck. Junior, senior, and graduate students. 22 hours. Peterson.

195. Clinic in X-ray Therapy. Junior or senior year. 11 hours. Stenstrom.

200. Research in Roentgenology. Hours and credits arranged. Rigler.

205. Research in Radiation Therapy. Hours and credits arranged. Stenstrom.

208. Radiology Seminar. 11 hours. Rigler and Stenstrom.

236. Radio Isotope. Seminar. 11 hours. (Same as Physiological Chemistry 236.) Stenstrom, Moore, Armstrong, and staff.

Division of Physical Medicine

Clinical Associate Professor Miland E. Knapp, M.D.; Assistant Professors Frederic J. Kottke,* M.D., William Kubicek,* P.H.D.; Instructors Ruby Green* (Physical Therapy), Borghild Hansen* (Occupational Therapy), Ardietta Johnson* (Occupational Therapy); Clinical Instructor Myron D. Lecklitner,* M.D.

122. Physical Therapy. Lectures and demonstrations. For senior medical students. 1 credit. Knapp.

ELECTIVE COURSES

105. Clinic in Physical Therapy. Junior and senior students. 22 hours. Knapp.

106. Lectures in Physical Therapy. 11 hours. Senior medical students and graduate students. Stenstrom and Knapp.

200. Physical Medicine. Service at University Hospitals, Minneapolis General Hospital, and other affiliated hospitals. Junior, senior, and graduate students. Hours and credits arranged. Knapp and Erickson.

210. Research in Physical Medicine. Junior, senior, and graduate students. Hours and credits arranged. Kottke and Kubicek.

220. Seminar in Physical Medicine. Junior, senior, and graduate students. Hours and credits arranged. Knapp.

* Full-time appointment.
† Not offered to fewer than ten students.

SURGERY

Departmental Office, E201 University Hospitals
Owen H. Wangensteen, Professor and Head

Professors Owen H. Wangensteen,* M.D., Ph.D., Head, Department of Surgery, Clarence Dennis, M.D., Ph.D., Arthur G. Strachauer,† M.D., Arthur A. Zierold, D.D.S., M.D., Ph.D.; Clinical Professors§ Walter A Fansler, M.A., M.D., James A. Johnson, M.D., E. Mendelssohn Jones, M.D., Oswald S. Wyatt, M.D., Harry B. Zimmerman, M.D.; Associate Professor Richard L. Varco, M.D., Ph.D.; Clinical Associate Professors§ James K. Anderson, M.D., Ph.D., George S. Bergh, M.D., Ph.D., Orwood J. Campbell, M.D., Ph.D., L. Haynes Fowler, M.S., M.D., William A. Hanson, M.D., Thomas J. Kinsella, M.D., N. Logan Leven, M.D., Ph.D., Stanley R. Maxeiner, M.D., Martin Nordland, M.D., Charles E. Rea, M.D., Ph.D., Edward A. Regnier, M.D., M.S., Roscoe C. Webb, M.D.; Associate Professor Emeritus Archa E. Wilcox, M.D.; Assistant Professors Arnold J. Kremen, M.D., Ph.D., K. Alvin Meredino,* M.D., Ph.D., David State,* M.D., Ph.D.; Clinical Assistant Professors§ Arthur F. Bratrud, M.D., Harry W. Christianson, M.D., George R. Dunn,† M.D., George D. Eitel, M.D., Victor P. Hauser, M.D., Earl C. Henrikson, M.D., M.S., N. K. Jensen, M.D., Frank S. McKinney, M.D., Carl O. Rice, M.D., Ph.D., Willard White, M.D.; Clinical Assistant Professor Emeritus Edward Moren, M.D.; Lecturers Lyle J. Hay, M.D., Ph.D., Carl W. Waldron, M.D., D.D.S.; Instructors Ivan D. Batonofsky,* M.D., Ph.D., Stanley R. Frieven,* M.D., Ph.D.; Clinical Instructors§ U. Schuyler Anderson, M.D., Frank Ankner, M.D., Harry F. Bayard, M.D., William C. Bernstein, M.D., Raymond E. Buirge, M.D., Ph.D., Kenneth Bulkley, M.D., Richard R. Cranmer, M.D., John M. Culligan, M.D., M.S., Leo C. Culligan, M.D., D. Greth Gardiner, M.D., Lawrence D. Hilger, M.D., Harold E. Hullsiek, M.D., Bernard G. Lannin, M.D., Ph.D., Lawrence M. Larson, M.D., Ph.D., Donald C. MacKinnon, M.D., Robert F. McGandy, M.D., George E. Moore, M.D., M.S., Nathan C. Plimpton, M.D., Rolla I. Stewart, M.D.; Clinical Assistants§ Edwin G. Benjamin, M.D., Harold C. Benjamin, M.D., Theodor Bratrud, M.D., Robert M. Caron, M.D., Edward C. Emerson, M.D., John M. Feeney, M.D., Kenneth Fritzell, M.D., Conrad I. Karleen, M.D., Hamlin Mattson, M.D., Daniel Moos, M.D., Maynard C. Nelson, M.D., Wallace Nelson, M.D., Frank W. Quattlebaum, M.D., Horace G. Scott, M.D.; Research Fellows Stuart W. Arhelger, M.D., Donald J. Ferguson, M.D., Samuel Hunter, M.D., Karl A. Karlson, M.D., Clarence W. Dillehei, M.D., Suad Niazi, M.D., Yoshio Sako, M.D., Lyle A. Tongen, M.D., M.S., Robert A. Toon, M.D., John J. Wild, M.D., M.S.

REQUIRED COURSES

121. Principles of Surgery. The basic principles of surgery, including anesthesia, antiseptics, asepsis, hemostasis, inflammations, and the process of the repair of tissues. Lectures and demonstrations. Sophomores. 33 hours; 3 credits. ofsky. (Beginning with the fall quarter, 1949, the First Aid Course to sophomores will be combined with this course.)

* Full-time appointment.
§ Titles prefixed by "clinical" indicate appointments on a part-time basis except as noted.
† Inactive status.

122. Basic Principles Involved in the Diagnosis, Treatment, and Prognosis of Fractures and Dislocations. Juniors. 11 hours; 1 credit. Dennis, Zierold, Campbell, Regnier, Henrikson, Moos, and Nelson.

126. Orientation Course in General Surgery. A series of clinical lectures on regional surgery (exclusive of urology, orthopedics, and neurosurgery), emphasizing pathology, diagnosis and essentials of treatment. These lectures attempt to orient the student in his study and reading. Juniors. 11 hours; 1 credit. Surgical staff.

129. Surgical Clinics for Juniors. Amphitheater clinic demonstrating surgical conditions in hospital patients. 33 hours; 3 credits. Surgical staff.

135. Clinical Clerkship. The individual study of assigned patients: case histories, physical examinations, diagnostic procedures, provisional diagnoses, and consideration of therapy; attendance at operations and observation of postoperative care. Juniors. 260 hours; 6 credits. Surgical staff.

135a. Clinical Pathology of Tumors. A combined clinical and pathological consideration of tumors. Insofar as available material permits, a systematic presentation of the manifestations and effects of malignant tumors which come in the province of general surgery and its divisions will be reviewed. Part of Course 135. University Hospitals. Surgical staff.

135b. Reading Course. A weekly recitation during the clerkship based on reading the surgical literature of an assigned topic.

135c. Medical-Surgical Pathological Conference. Weekly combined meetings of medical and surgical staffs in which the post-mortem findings of particularly interesting and instructive cases are discussed. Part of Course 135.

135d. Roentgenological-Surgical Conference. The films of all surgical patients presenting interesting roentgen findings are reviewed. (See also Radiology program.) Part of Course 135. Staffs of the Departments of Radiology and Surgery.

135e. Surgical Ward Conference. Weekly conference in which cases presenting interesting problems are discussed. Part of Course 135. Surgical staff.

135f. Outpatient Surgical Clinic, General Surgery, and Proctology. Sections daily in the Outpatient Department. Part of Course 135. Wangensteen, Dennis, Varco, J. K. Anderson, Kremen, Merendino, State, Baronofsky, Emerson.

135g. Applied Surgical Anatomy. Weekly demonstrations in which by the use of dissections prepared by surgical fellows a systematic review of the regional anatomy of the major conditions coming within the purview of surgery and its specialties is presented. Part of Course 135. Surgical staff.

135h. Emergency Traumatic Surgery. Under the supervision of the hospital staff the student participates in the care of such cases. Part of Course 135. Minneapolis General Hospital surgical staff.

135k. Physiological-Surgical Conference. Weekly combined meetings of physiological and surgical staff in which cases of particular interest are discussed. (See also Physiology program.) Staffs of the Departments of Physiology and Surgery. No credit.

136. Surgical Specialties. The individual study of assigned patients on the urological, orthopedic, and neurosurgical services. History taking, examination, special studies, diagnosis, and therapy are considered, with attendance at operations. Seniors. 135 hours; 5 credits. Cole, Creevy, Peyton, Knight, and staff.

136d. Anesthetics. Administration of anesthetics under supervision. Part of Course 136. University Hospitals. Knight and staff.

137. Principles of Cancer Therapy. Required course for seniors. Lecture course of cancer fundamentals as it pertains to cancerogenesis and therapy.
138. Clerkship in Fractures and Dislocations. Seniors. Students are instructed and supervised in care of fracture cases and dislocations. Part of Course 136. Minneapolis General Hospital surgical staff.

ELECTIVE COURSES

139. Operative Surgery. The student is permitted to participate in surgical procedures on hospital patients in the operating room. Hours and credits arranged. Staff.
152. Problems in Clinical Investigations. A study of special case records correlated with literature study. Hours and credits arranged. Wangensteen, Creevy, Peyton, Dennis, Varco, Kremen, Merendino, and Baronofsky.
167. Problems in Experimental Surgery. Students under supervision will investigate problems assigned to them. As their experience increases they are permitted to do the operations incident to their problems. Hours and credits arranged. Wangensteen, Creevy, Peyton, Dennis, Varco, Kremen, and Baronofsky.
169. Diagnostic Bedside Surgical Clinic. Hours and credits to be arranged. Minneapolis General Hospital. At least four students must register if course is to be given. Dennis and Zierold.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

200. Outpatient Clinic in Surgery. The student is required to assist in the Outpatient Surgical Clinic, and to participate in diagnosis and treatment. University Hospital surgical staff.
201. Outpatient Clinic in Surgery. Minneapolis General Hospital surgical staff.
202. Applied Surgical Anatomy on the Cadaver. Surgical fellows prepare dissections with staff supervision.
203. Proctoscopy and Sigmoidoscopy. The diagnosis and treatment of lesions of the lower bowel. University Hospitals surgical staff.
203a. Proctoscopy and Sigmoidoscopy. Minneapolis General Hospital surgical staff.
204. Tumor Clinic. A combined clinical and pathological consideration of tumors as seen by the general surgeon. Staffs of Departments of Surgery and Biophysics. Stenstrom, Varco, and Kremen.
214. Surgical Ward Conference. Presentation of interesting cases by the students. University Hospitals surgical staff.
215. Roentgenological-Surgical Conference. A weekly review of the films of all surgical patients. Staffs of the Departments of Radiology and Surgery.
218. Medical and Surgical Pathological Conference. Review of interesting cases by the medical, surgical, and pathological staffs.

COURSES PRIMARILY FOR GRADUATE STUDENTS (GENERAL SURGERY)

205. Surgical Diagnosis. The surgical fellow assists in the instruction of the clinical clerks and interns, and studies problems in diagnosis in the Outpatient Department and in the University Hospitals. Wangensteen, Dennis, Varco, Bergh, Rea, Kremen, State, Baronofsky, and Bernstein.
208. Surgical Service. The surgical fellow acts as house surgeon at the University Hospitals. Wangensteen, Dennis, Varco, Bergh, Leven, Rea, and Kremen.
211. Operative Surgery. The surgical fellow acts as first assistant at operations in the University Hospitals, and later may be permitted to operate. Wangensteen, Dennis, Varco, Leven, Rea, Kremen, Baronofsky, and Bernstein.

216. Surgical Research. Problems in experimental or clinical surgery. University Hospitals surgical staff.
217. Surgical Seminar. Conferences for review of surgical literature, for presentation of cases, and as research. University Hospitals surgical staff.
225. Surgical Diagnosis. Minneapolis General Hospital. Dennis, Zierold, Fansler, Campbell, and Regnier.
228. Surgical Service. Minneapolis General Hospital. Dennis, Zierold, Fansler, Campbell, and Regnier.
231. Operative Surgery. Minneapolis General Hospital. Dennis, Zierold, Fansler, Campbell, and Regnier.
236. Surgical Research. Minneapolis General Hospital. Dennis, Zierold, Fansler, Campbell, and Regnier.
237. Surgical Seminar. Minneapolis General Hospital. Surgical staff.

Division of Neurosurgery

Professor William T. Peyton,* M.D., Ph.D., Director; Assistant Professor Lyle A. French, M.D., Ph.D.; Clinical Professor Emeritus§ J. Frank Corbett, M.D.; Clinical Assistant Professors§ George R. Dunn, M.D., Wallace P. Ritchie, M.D., M.S.; Clinical Instructors§ Harold F. Buchstein, M.D., M.S., Leonard A. Titrud, M.D., Ph.D.

REQUIRED COURSES

127. Surgical Diseases of the Nervous System. Lectures on the surgical diseases of the brain, spinal cord, meninges, peripheral nerves, and sympathetic nervous system. Juniors. 11 hours; 1 credit. Peyton and associates.
162. Outpatient Clinic in Neurosurgery. Examination and observation of patients with surgical diseases of the nervous system before and after operation. Part of Course 136.
163. Clinical Clerkship in Neurosurgery. Case studies. Part of Course 136.
163. Neurosurgery Clerkship. For seniors. The individual study of assigned patients on the Neurosurgical Service. History-taking examination, special studies, diagnosis and therapy are considered, with attendance at operations. Peyton and staff.
163a. Neurosurgical-Neurological-Roentgenologic Conference. A weekly review of X-rays and case histories on Neurosurgical and Neurological Services. (Part of Course 163.) Peyton, Baker, Peterson, and Staff.

COURSES FOR GRADUATE STUDENTS

305. Neurosurgical Diagnosis. The neurosurgical fellow assists in the instruction of the clinical clerks and interns, and studies problems in diagnosis in the Outpatient Department and in the University Hospitals. Peyton.
308. Neurosurgical Service. The neurosurgical fellow acts as house surgeon at the University Hospitals. Peyton.
311. Operative Neurosurgical Surgery. The neurosurgical fellow acts as first assistant at operations in the University Hospitals, and later may be permitted to operate. Peyton.
316. Neurosurgical Research. Problems in experimental or clinical surgery. University Hospitals surgical staff. Peyton.
318. Neurosurgical Conference. A review of X-rays and case histories on Neurosurgical Service.

* Full-time appointment.
§ Titles prefixed by "clinical" indicate appointment on a part-time basis.

Division of Orthopedic Surgery¶

Professor Wallace H. Cole, M.D., Director; Professor Emeritus Charles A. Reed, M.D.; Clinical Associate Professors Carl C. Chatterton, M.D., Edward T. Evans, M.D.; Clinical Assistant Professors Paul W. Giessler, M.D., Myron O. Henry, M.D., John H. Moe, M.D., Stewart W. Shimonek, M.D.; Clinical Instructors John D. Galloway, M.D., Meyer Z. Goldner, M.D., Vernon L. Hart, M.D., Malvin J. Nydahl, M.D., William Von der Weyer, M.D., George A. Williamson, M.D.; Clinical Assistants Donald R. Lannin, M.D., Donovan L. McCain, M.D., Richard E. Reilley, M.D.

REQUIRED COURSES

140. Orthopedic Surgery in Children. Clinical lectures, demonstrations, and operations. Juniors. 11 hours; 1 credit. Cole, Chatterton, and staff.
142. Lectures in Orthopedic Surgery. Orthopedic conditions in the adult; lantern slides and demonstrations. Juniors. 11 hours; 1 credit. Orthopedic surgery staff.
145. Orthopedic Outpatient Clinic. Part of required section clinics. Three times weekly. Part of Course 136.

COURSES FOR GRADUATE STUDENTS

405. Orthopedic Diagnosis. The orthopedic fellow assists in the instruction of the clinical clerks and interns, and studies problems in diagnosis in the Outpatient Department and in the University Hospitals. Cole and Hall.
408. Orthopedic Service. The orthopedic fellow acts as house surgeon at the University Hospitals. Cole and Hall.
411. Orthopedic Operative Surgery. The orthopedic fellow acts as first assistant at operations in the University Hospitals and later may be permitted to operate.
416. Orthopedic Research. Problems in experimental or clinical surgery. University Hospitals. Cole and Hall.

Division of Anesthesia¶

Clinical Professor Ralph T. Knight, M.D., Director; Clinical Associate Professors Joseph W. Baird, M.D., Stanley R. Maxeiner, M.D.; Clinical Instructor Stanley P. Wesolowski, M.D.

121b. Principles of Anesthesia. Part of Course 121. 5 lectures. Knight.
136e. Individual Instruction in Anesthesia. Part of Surgical Specialties, Course 136.
136g. Clinical Conferences in Anesthesia. Part of Surgical Specialties, Course 136.

ELECTIVE COURSES

165. Clinical Anesthesia. Selected students may spend additional time in the clinical administration of anesthetics. Knight.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

104. Principles of Anesthesia. Lectures and conferences. 11 hours; 1 credit. Knight.

COURSES PRIMARILY FOR GRADUATE STUDENTS

266. General Anesthesia. Instruction and experience in general and regional anesthesia. Knight.
267. Pre- and Post-operative Evaluation. Selection of the proper anesthetic and observation of its after-effects upon the patient. Knight.

¶ All members of this division are on part-time basis.

268. Research in Anesthesia. Qualified students may investigate problems in anesthesia either in the laboratory of experimental surgery or in the hospital. Knight.

269. Seminar in Anesthesia. Regular conferences for review of anesthesia literature and reports on interesting cases and problems, as well as of research work being done by the division of anesthesia. Knight.

Division of Urology

Professor C. D. Creevy, M.D., Ph.D., Director; Clinical Associate Professors§ Frederick E. B. Foley, M.D., Theodore H. Sweetser, M.D.; Clinical Assistant Professors§ William J. Noonan, M.D., Baxter A. Smith, M.D., M.S., Edgar A. Webb, M.D.; Clinical Instructors§ Philip F. Donohue, M.D., Richard S. Rogers, M.D., Ragner T. Soderlind, M.D.; Clinical Assistants§ Irving Farsht, M.D., Richard F. Leick, M.D., Edwin G. Olsen, M.D., Theodore L. Stebbins, M.D., Gordon W. Strom, M.D.

REQUIRED COURSES

170. Clinical Clerkship in Urology. Case studies. Part of Course 136.

170a. Cystoscopic Clinic. Demonstration of cystoscopy. Part of Course 136. Hours and credits arranged. Staff.

170b. Outpatient Clinic in Urology. The observation, examination, and treatment of patients. Seniors. Part of Course 136. Urological staff.

ELECTIVE COURSES

160. Clinic in Urology at Minneapolis General Hospital. Seniors; 17 hours. Sweetser.

161. Clinic in Urology at Ancker Hospital. Seniors; 17 hours. Foley and Donohue.

COURSES FOR GRADUATE STUDENTS

250. Urological Surgery.

251. Cystoscopy and Urological Diagnosis.

252. Urological Conference.

253. Research in Urology.

Details will be found in the *Bulletin of the Graduate Medical School.*

INTERDEPARTMENTAL INSTRUCTION AND SPECIAL COURSES

CORRELATION CLINICS

Scheduled throughout the medical course beginning with the third freshman quarter these clinics provide early contact with clinical disease and assist in the proper correlation of the instruction given in the fundamental sciences of the freshman and sophomore years. The clinics for junior and senior students (applied medical sciences) assure continuing contact of the upper classmen with the fundamental science departments and departmental staffs. Not given for credit.

SOCIAL AND ECONOMIC ASPECTS OF MEDICAL CARE

Survey of national health problems, structure of medical care, sickness insurance, and related topics. Second quarter of senior year, 2 credits. Weaver.

§ Titles prefixed by "clinical" indicate appointment on a part-time basis.

ORIENTATION TO PRACTICE

Survey of opportunities in medicine, types of medical practice, suggestions about opening an office, medical licensure, medical organizations, etc. Third quarter of senior year, 12 hours, not for credit. Weaver and invited lecturers.

MEDICAL MILITARY SCIENCE (ROTC MEDICAL)

Thirty-two clock hours of instruction in each year of the medical course. Eligibility for advanced standing is based on previous military experience. Enrolled students are paid a stipend by the U. S. Army during the last two years of the ROTC course. There is also compensation for camp attendance, with transportation to and from camp. The summer camp is held at Fort Sam Houston, San Antonio, Texas, during the summer immediately following the second or third year of ROTC instruction.

INSTITUTE OF TECHNOLOGY

SCHOOL OF CHEMISTRY

Any advanced work given in the School of Chemistry may be elected for credit in the Medical School. Such courses as Colloid Chemistry, 128, 129, 130 by Dr. Reyerson, and Organic Chemistry 142-143, The Chemistry of Natural Products, by Drs. Lauer and Arnold are recommended.

For description of these courses see *Bulletin of the Institute of Technology.*

DEPARTMENT OF ZOOLOGY

(Contributing elective courses to the Medical School)

For faculty, see the *Science, Literature, and the Arts Bulletin.*

51f.‡ Introductory Animal Parasitology. An elementary course dealing with parasitic Protozoa, worms, and arthropods, and their relation to diseases of man and animals. 5 credits. Wallace.

107-108.‡ Protozoology. Lecture, laboratory, and reference work. 3 credits each quarter. Osterud.

144.‡ Medical Entomology. A study of arthropods which serve as vectors of pathogenic organisms of man and animals. Lecture and laboratory. 3 credits. Burroughs.

145.‡ Parasitic Protozoa. Protozoal parasites of man and animals including laboratory diagnosis. Lecture and laboratory. 3 credits. Wallace.

146.‡ Helminthology. Worm parasites of man and animals. Lecture and laboratory. 3 credits. Wallace.

170.‡ Advanced Genetics. General laws involved in heredity and variation, exclusive of man. Lecture and laboratory. 3 credits. Reed.

171. Genetics of Speciation. 3 credits. Reed.

175. Human Genetics. A study of the inherited characters in man from the standpoint of medicine. 3 credits. Reed.

180.‡ Comparative Embryology. Lecture and laboratory. 3 credits. Ringoen.

181. Endocrines and Reproduction. 3 credits. Ringoen.

182. Experimental Embryology. Recent investigations in developmental mechanics. 3 credits. Ringoen.

‡ A fee of $1.50 per quarter is charged for this course.