

*The Bulletin of the*  
UNIVERSITY of MINNESOTA

Course in Medical Technology  
1951-1953

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Volume LIV, Number 16

March 22, 1951

*Entered at the post office in Minneapolis as semi-monthly second-class matter, Minneapolis, Minnesota. Accepted for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 12, 1918*

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The Board of Regents is composed of The Honorable Ray J. Quinlivan, St. Cloud, First Vice President and Chairman; The Honorable George W. Lawson, St. Paul, Second Vice President; The Honorable James F. Bell, Minneapolis; The Honorable Daniel C. Gainey, Owatonna; The Honorable Richard L. Griggs, Duluth; The Honorable J. S. Jones, St. Paul; The Honorable Lester A. Malkerson, Minneapolis; The Honorable Charles W. Mayo, Rochester; The Honorable E. E. Novak, New Prague; The Honorable A. J. Olson, Renville; The Honorable Herman F. Skyberg, Fisher; and The Honorable Sheldon V. Wood, Minneapolis.

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## GENERAL INFORMATION

### HISTORICAL STATEMENT

The University of Minnesota was one of the first universities to confer a degree for a sequence of courses pertaining to medical technology. The first bulletin was published March 10, 1922, with the title *Courses in Medical Technology for Clinical and Laboratory Technicians*. The first graduate received her degree in March, 1923, and up to the present, 1951, there have been 935 graduates.

The course was organized under the direction of Dr. Richard Olding Beard. It has always consisted of four years of college work with credit given for practical work in the hospital laboratories during the fourth year.

After the retirement of Dr. Beard in 1925, the course was under the supervision of a special committee of representatives of the Graduate School of the Medical School of which Dr. William A. O'Brien was chairman. In May, 1940, Dr. Evans was appointed director of the Course in Medical Technology.

### MEDICAL TECHNOLOGY

The Course in Medical Technology is four years in length and leads to the degree, bachelor of science. The first two years are spent in the College of Science, Literature, and the Arts. At the beginning of the third year the student transfers his registration to the Medical School. The entire fourth year of twelve months consists of practical rotating service in the laboratories of the University of Minnesota Hospitals.

This course is a desirable preliminary to graduate work in hematology, bacteriology, or physiological chemistry, and has a general educational value in the biological sciences. For the student planning to enter medicine it is an ideal preliminary training.

### OPPORTUNITY FOR X-RAY TECHNOLOGY

Students satisfying the requirements of the Course in Medical Technology have the opportunity without further payment of fees to spend an additional six months of practical training in the X-ray laboratory of the University of Minnesota Hospitals.

The Department of Radiology through the Center for Continuation Study offers a practical short course open to students who have had two years of college or its equivalent in nurses' training. The course consists of five quarters or approximately fifteen months of study and practical work in X-ray technique. Additional information may be obtained from the Department of Radiology, M-535, University Hospitals.

### TRAINING

**Medical Technology**—A medical technologist is trained in the performance of various diagnostic procedures used by physicians. Her work includes hematology, urinalysis, bacteriology, serology, electrocardiography, basal metabolism, parasitology, blood bank work, the preparation of tissues for microscopic study, and the chemical analysis of blood and urine. This work requires intelligence, accuracy, and reliability of a high order. As a general rule, a student who has excelled in scientific subjects in high school will succeed in medical technology.

**X-ray Technology**—This work includes photographic processing, the taking of X-ray films, assisting in the fluoroscopic examinations, and assisting in the administration of X-ray for therapy. The work is physically hard and requires accuracy and reliability of a high order.

### EMPLOYMENT

The broad training obtained in these fields enables the graduate to qualify for positions requiring general or specialized laboratory experience in hospital laboratories, clinics, and physicians' offices. In larger hospitals where there are several technologists, one may be occupied principally or entirely with hematology, bacteriology, or chemistry. There are opportunities for graduates with sufficient ability to work in research and teaching laboratories associated with larger clinics, foundations, and universities.

### ADMISSION TO FRESHMAN CLASS

The requirements for admission to preprofessional work of this course of study are the same as those for admission to the College of Science, Literature, and the Arts. For complete information consult the *Bulletin of General Information*. Qualified applicants, men or women, may enter at the beginning of any quarter, but the curricula outlined are based on entrance in the fall quarter. If a student enters at any other quarter, Summer Session attendance may be necessary to make up the irregularities in the student's program.

It is recommended that prospective students take mathematics, physics, chemistry, and at least two years of a language in high school.

### ADMISSION TO THE JUNIOR CLASS

For admission to the Course in Medical Technology the student must have completed 90 credits including the required courses with a total of 90 honor points. For each five honor points in excess of one honor point per credit the number 90 is diminished by one.

Those students registered the first two years at the University of Minnesota who expect to complete the requirements for admission to the junior year before or during the following winter quarter must file an application for change of college with the Office of Admissions and Records by June 5.

Students from other accredited colleges and universities may transfer to the University of Minnesota to complete the Course in Medical Technology. Courses which are equivalent to those given at the University of Minnesota are accepted to satisfy the requirements for entrance to the Course in Medical Technology.

Students transferring from other colleges may obtain application for admission with advanced standing from the Office of Admissions and Records. These applications must be filed with the Office of Admissions and Records by July 1.

In some instances, students transferring from other colleges may be able to make up their deficiencies, such as in bacteriology and histology, by attending Summer Session classes. This would make them eligible for admission to the special medical technology courses as much as one year earlier than would be possible otherwise. Transfer students with three or more years of college training elsewhere will be permitted to begin the senior year (12 months of practical training in the University Hospitals laboratories) as soon as all required courses are completed. Because certain of these courses are offered only at the University, it is usually necessary for transfer students to spend one or more quarters in attendance before beginning the senior practical work. It is necessary for all students to earn at least 45 credits in residence at the University of Minnesota before they are eligible to receive a degree. It is strongly advised that transfer students ascertain their status by writing to the Director, Course in Medical Technology, University of Minnesota Hospitals, Minneapolis 14, before May 1 so that, if necessary, they may take courses during the Summer Session.

### DEGREES

The requirements for graduation are the completion of all the required courses or their equivalent, the completion of the practical work, and a total of 180 credits and 180 honor points—an average of one honor point per credit. The total number of required credits may be reduced in accordance with the quality credit rule of the College of Science, Literature, and the Arts.

Upon satisfactory completion of the prescribed course of study, the degree, bachelor of science, will be conferred by the Board of Regents. Students completing the course with an average of two honor points for each credit may graduate "with distinction" and those with an average of two and a half honor points for each credit may graduate with "high distinction."

### FEES

For complete information about fees, expenses, residence, consult the *Bulletin of General Information*.

All university fees are subject to modification without notice.

During the first two years, the student is enrolled in the College of Science, Literature, and the Arts. The tuition for residents of the state of Minnesota is \$30 each quarter, that is, \$90 a year; for nonresidents, \$75 each quarter, or \$225 each year.

During the junior and senior years after admittance to the Course in Medical Technology the tuition is \$42 each quarter for residents and \$90 each quarter for nonresidents. During the fourth year the student is given instruction and training for four quarters (twelve months) but pays tuition for only three quarters. No tuition is charged for the six months of practical training in X-ray when it is taken in conjunction with the Course in Medical Technology.

In addition there is a matriculation deposit of \$5 payable with the first registration only, and an incidental fee of \$13.35 a quarter for which the student receives privileges such as the Health Service, Testing Bureau, Coffman Memorial Union, university post-office service, and the *Minnesota Daily* including the Official Daily Bulletin. Laboratory deposits are required from students taking science courses.

Medical Technology students do not live in the hospital, nor are they supplied with books, meals, or uniforms; these must be furnished by the students themselves. Laundry of uniforms is furnished students during the hospital training.

### RESIDENCES

Comstock Hall, Sanford Hall, Brewster Hall, and the Winchell Cottages are university owned and operated dormitories. Preferential treatment is given all applicants who are Minnesota residents. In addition to these facilities maintained by the University, there are numerous private rooming houses for women students. All of these are inspected and must meet minimum standards of operation set by the University.

It is inadvisable to make reservations for a room in a private dwelling before seeing the room. Several of the available vacancies should be seen before definite commitments are made.

Further information than that supplied here may be obtained by writing to the Director of the Student Housing Bureau, Room 204, Eddy Hall.

### REGISTRATION

All prospective students are urged to consult advisers in the Medical Technology office, N-202, University Hospitals. This should be done in person if possible. Each new student will be assigned a special adviser in the Medical Technology office to whom he is requested to submit his registration for approval each quarter.

### STUDENT AID

The University of Minnesota offers many opportunities to those students in need of financial assistance to meet the expenses of their education. The usual criteria by which the merits of requests for financial assistance are considered are scholastic record, financial need, character, and vocational promise in the student's chosen field.

The various types of financial aids are classified as loans, scholarships, prizes and awards, and opportunities for employment.

If you are a direct blood descendant of a veteran of World War I, you are eligible to apply for the LaVerne Noyes Scholarship, which covers the amount of tuition and incidental fee. Recipients of this scholarship are selected on the basis of the criteria given above. You may be eligible for assistance from other general university scholarship funds. Although scholarship assistance is usually not granted until a student has completed at least two quarters of work in the University, it may be to your advantage to inquire about the possibilities of such aid now.

Loans are available to any fully registered student in the University who has completed two quarters of work and is making satisfactory progress toward a degree. Either a loan or a scholarship may be helpful supplements to savings, family aid, and part-time earnings. A grant of either one is considered an honor since their primary purpose is to help promising students who might otherwise have to delay or neglect their studies to earn a living. A student loan in proper proportion to other sources of income available to the student is a sound investment. It has kept many students from having to drop out before completing their educational objectives.

Further information concerning your opportunities for obtaining financial assistance may be obtained from the Bureau of Student Loans and Scholarships, Office of the Dean of Students, 211 Eddy Hall.

In addition to general university loan and scholarship funds, there are two funds especially for students in medical technology, the William A. O'Brien Scholarship Fund and the W. K. Kellogg Foundation Loan Fund. For the special medical technology loan fund, applications for assistance must be made to the Bureau of Student Loans and Scholarships, but it is recommended that the student requesting such assistance should first have a personal interview with the medical technology adviser, N-202, University Hospitals.

The University maintains an Employment Bureau, Room 17, Administration Building, for the purpose of helping both men and women students who seek work, and of developing, in all proper ways, opportunities for self-help. It should be pointed out that each of the first three years of the Course in Medical Technology includes several courses which require many hours of work in the laboratory, and it is advised that only students who are proficient in their studies should attempt to do part-time work. During the fourth year, the practical work requires as much time as a full-time position and no student should arrange for outside or part-time work that will interfere with such a program.

# CURRICULUM

## MEDICAL TECHNOLOGY

### FRESHMAN AND SOPHOMORE YEARS

The following courses or their equivalents must be completed before the student will be admitted to the junior year:

Anal. Chem. 7, Quantitative Analysis (4 cred.)

Anat. 4, Elementary Anatomy (5 cred.)

Bact. 53, General Bacteriology (5 cred.)

Comp. 4-5-6, Freshman Composition (9 cred.)

or

Com. 1-2-3, Communication (12 cred.)

or

Eng. A-B-C, Freshman English (15 cred.), or exemption from requirement

Inorg. Chem. 1-2, or 4-5, General Inorganic Chemistry (8 cred.)

Inorg. Chem. 11, Semimicro Qualitative Analysis (4 cred.)

Org. Chem. 61-62, Elementary Organic Chemistry (8 cred.)

Phys. 1-2-3, Introduction to Physical Sciences (9 cred.)

Zool. 1-2-3, General Zoology (10 cred.)

Zool. 21, Histology (5 cred.)

Electives to make a total of 90 credits for the two years' work. There is no essential limitation to the subjects which may be taken as electives. However, a program that includes scattered electives will not be approved.

Some of the above courses are offered only one quarter a year. Therefore, it is essential that the student's program be arranged in such a way as to include these in the proper quarter.

Suggested program:

#### Freshman Year

##### Fall

English A, 4 or Com. 1

Zoology 1

Inorganic Chemistry 1 or 4

Electives

##### Winter

English B, 5 or Com. 2

Zoology 2

Inorganic Chemistry 2 or 5

Electives

##### Spring

English C, 6 or Com. 3

Zoology 3

Inorganic Chemistry 11

Electives

#### Sophomore Year

##### Fall

Analytical Chemistry 7

Physics 1

Zoology 21

Electives

##### Winter

Organic Chemistry 61

Physics 2

Bacteriology 53

Electives

##### Spring

Organic Chemistry 62

Physics 3

Anatomy 4

Electives

### JUNIOR AND SENIOR YEARS

In order to meet the requirements for graduation, the following courses must be completed:

Anat. 165, Hematology (4 cred.)

Bact. 102, Medical Bacteriology (5 cred.)

Bact. 116, Immunology (3 cred.)

Med. Tech. 51-52, Introduction to Medical Technology, Lectures (Cred. ar.)

Med. Tech. 61, Introduction to Medical Technology, Laboratory (Cred. ar.)

Med. Tech. 101, Methods and Clinical Orientation (No cred.)

Med. Tech. 102, Senior Practical Work (45 cred.)

Physiol. 60, Human Physiology (6 cred.)



Physiol. Chem. 102-103, Physiological Chemistry (12 cred.)  
 Zool. 51, Introductory Animal Parasitology (5 cred.)  
 Electives to make a total of 180 credits for four years' work

**Suggested program :**

**Junior Year**

<i>Fall</i>	<i>Winter</i>	<i>Spring</i>
Zoology 51	Physiological Chemistry 102	Physiological Chemistry 103
Anatomy 165	Bacteriology 102	Bacteriology 116
Medical Technology 51	Medical Technology 52	Medical Technology 61
Physiology 60		

**Senior Year**

Medical Technology 101 (No cred.)

Medical Technology 102

Med. Tech. 102 includes the following:

- Bacteriology (5 cred.)
- Basal Metabolism (2 cred.)
- Blood Bank (3 cred.)
- Chemistry (10 cred.)
- Dispensary (2 cred.)
- Electrocardiography (2 cred.)
- Hematology (6 cred.)
- Histological Technique (4 cred.)
- Parasitology (2 cred.)
- Serology (2 cred.)
- Urinalysis (2 cred.)
- Supplementary work including night duty (5 cred.)

Students are eligible to begin the year of practical training (Med. Tech. 102) as soon as they have completed all of the theoretical courses with the exception of Med. Tech. 101. The scholastic standing in the first three years determines the order in which students are assigned to the hospital laboratory for their practical training.

**X-RAY TRAINING**

Students taking the X-ray training in addition to laboratory training must complete all the requirements for Medical Technology and X-ray 65. Students electing this training will be scheduled for X-ray 65 at the time that assignments for hospital laboratory training are made.

X-ray 65, Senior Practical Work (22 cred.)

## DESCRIPTION OF COURSES

Other courses which are equivalent or more comprehensive may be substituted for the required courses. The quarterly *Class Schedule* issued at the time of registration should be consulted for class hours and course fees.

### ANATOMY (HUMAN)

4s. Elementary Anatomy.

165f,su. Hematology. Normal and pathologic morphology of the blood, with special emphasis on the study of the blood from the standpoint of diagnosis and prognosis.

### BACTERIOLOGY

53f,w,s,su. General Bacteriology. Methods of staining and identification; principles of sterilization and disinfection; examination of air, water, milk; relation of bacteriology to the industries and to disease; bacteriology as a science; morphology and physiology.

102w,su. Medical Bacteriology. The pathogenic bacteria, especially in relation to definite diseases.

116s,su. Immunology. Laws of hemolysis; quantitative relationship between antigen and antibody; Wassermann reaction; opsonins, vaccines, toxin, antitoxin, precipitin reactions, blood grouping, atopy, anaphylaxis.

### CHEMISTRY

#### *Inorganic Chemistry*

1f,w,su-2w,s,su. General Inorganic Chemistry. Study of the general laws of chemistry and of the nonmetals and metals and their compounds.

4f,w,su-5w,s,su. General Inorganic Chemistry. (See Inorg.Chem. 1-2)

11f,w,s,su. Semimicro Qualitative Analysis. Laboratory work in systematic qualitative analysis of the cations with lectures on solutions, ionization; chemical and physical equilibria, oxidation and reduction, etc.

#### *Analytical Chemistry*

7f,s,su. Quantitative Analysis. Introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems are assigned and attention is given to proper laboratory practice.

#### *Organic Chemistry*

61f,w,su-62w,s,su. Elementary Organic Chemistry. Discussion of important classes of organic compounds, both aliphatic and aromatic together with some heterocyclic compounds. Laboratory work includes the preparation of typical substances.

### ENGLISH

IMPORTANT NOTE—No student may register for any course in Freshman English without taking a placement test. Assignment to a particular course in Freshman English will depend on the student's record in this placement test.

Af-Bw-Cs. Freshman English.

4f-5w-6s. Freshman Composition.

## GENERAL STUDIES

1f-2w-3s. Communication.

## MEDICAL TECHNOLOGY

- 51f-52w. Introduction to Medical Technology. Lectures, discussions, and demonstrations on certain tests performed in the hospital laboratories, including a consideration of the principles on which the methods are based, and the significance of the results. (Open only to students already accepted in the Course in Medical Technology)
- 61f,w,s. Introduction to Medical Technology. Laboratory work based on the above. (Open only to students already accepted in the Course in Medical Technology)
- 101f-w-s. Methods and Clinical Orientation. Lectures and discussions on laboratory procedures, comparison of methods, fine points of technique, preparation of materials, solutions, media, etc., the use of apparatus, and laboratory organization. Case histories and patients presented to illustrate the value and importance of laboratory work to clinical practice. (Open only to students taking Med. Tech. 102)
- 102f-w-s-su. Senior Practical Training. Extends throughout twelve consecutive months of the year (four quarters). Practical laboratory experience in a rotating service through the laboratories of the University of Minnesota Hospitals. (45 cred.) (Open only to students accepted in the Course in Medical Technology and who have completed all the required courses with the exception of Med. Tech. 101)

## PHYSICS

1f-2w-3s. Introduction to Physical Science. Lectures and experimental demonstration of the principles underlying physical phenomena.

## PHYSIOLOGICAL CHEMISTRY

102w-103s. Physiological Chemistry.

## PHYSIOLOGY

60f. Human Physiology.

## X-RAY TECHNOLOGY

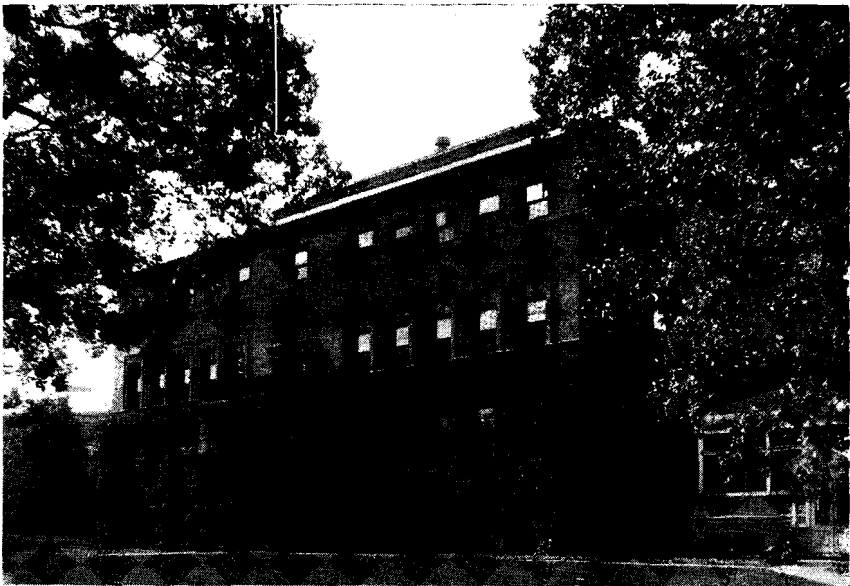
65f-w-s-su. Senior Practical Work. Extends through consecutive period of six months. Practical experience in X-ray technique, including photographic processing, exposures, positioning, fluoroscopic assistance, reception of patients. Special lectures in X-ray physics and X-ray technique arranged throughout this period. (Open only to students who have completed requirements for degree in medical technology)

## ZOOLOGY

- 1f,su-2w,su-3s,su. General Zoology. Structure, physiology, embryology, classification, and evolution of animals.
- 21f,su. Histology. Microscopic structure of the tissues and organs.
- 51f. Introductory Animal Parasitology. An elementary course dealing with parasitic protozoa, worms and arthropods and their relation to disease of men and animals.

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The College of Pharmacy Announcement  
for the Years 1951-1953



Volume LIV, Number 22

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Charles V. Netz, Ph.D., Professor of Pharmacy and Head of the Department  
Taito Soine, Ph.D., Professor of Pharmaceutical Chemistry  
Willard J. Hadley, Ph.D., Professor of Pharmacy  
Wallace F. White, Ph.D., Associate Professor of Pharmacognosy  
Ragnar Almin, M.S., Assistant Professor of Pharmacy and Chairman of the Students' Work Committee  
Frank E. DiGangi, Ph.D., Associate Professor of Pharmaceutical Chemistry  
\_\_\_\_\_, Assistant Professor of Pharmacognosy

## GENERAL INFORMATION

### COURSES OF STUDY

The College of Pharmacy offers one undergraduate course of four academic years leading to the degree of bachelor of science in pharmacy (B.S. in Phm.).

The College of Pharmacy and the School of Business Administration offer an optional combined course in Pharmacy and Business Administration leading to the degrees of bachelor of science in pharmacy (B.S. in Phm.) and bachelor of business administration (B.B.A.). This optional course is open only to those students who register in the College of Pharmacy either with or without advanced standing and who can present evidence of better than average ability. Students who are permitted to register for this course of study must take the professional and business administration courses in the sequences in which they are offered. See page 11.

Graduate study with major work in pharmaceutical chemistry or pharmacognosy, leading to the degrees of master of science (M.S.) and doctor of philosophy (Ph.D.), respectively, is offered by the Graduate School. Graduate work with a major in pharmaceutical chemistry or pharmacognosy is open to those students who have shown exceptional scholarship and ability in the undergraduate course of this or some other college of pharmacy of equal standing. Consideration will be given to the applications of those students who are not graduates in pharmacy but whose pattern of undergraduate work includes training in such allied or related subjects as would implement them to pursue work successfully at the graduate level with a major in pharmaceutical chemistry or pharmacognosy. Detailed information in graduate courses in pharmaceutical chemistry and pharmacognosy is contained in the *Bulletin of the Graduate School* which may be obtained from the office of the Graduate School, University of Minnesota.

### ADMISSION BY CERTIFICATE

Diplomas or other evidences of the completion of an accredited four-year high school course, or of its educational equivalent, are required for admission. For details concerning the requirements for admission, consult the *Bulletin of General Information*.

### ADMISSION BY EXAMINATION

Students who do not meet the requirements for admission by certificate may qualify for admission on the basis of entrance tests as described in the *Bulletin of General Information*.

### ADMISSION TO THE PROFESSIONAL WORK OF THE SOPHOMORE YEAR IN PHARMACY

In order to maintain instruction at the necessary professional level, it is imperative to restrict admissions to the sophomore year in the College of Pharmacy. Students interested in entering the sophomore year of this college at the beginning of any fall quarter should apply for admission as soon as possible after completion of the required work of the freshman year, and not later than August 1. Applications should be accompanied by an official transcript of the students' record. These applications will be reviewed and all applicants will be notified within thirty days after complete application and transcript have been received. All resident applicants with honor point ratios of 1.5 (C plus) or above, meeting all prerequisites, will be admitted to the sophomore year. Other applicants (those with honor point ratios of

below 1.5, those removing deficiencies, and nonresident applicants) will be considered individually and will be notified of their admission status either before or shortly after September 1, 1951.

Students who contemplate the completion of course deficiencies during a Summer Session should proceed as indicated above, being sure to supply information on (1) deficient subjects to be removed; (2) the dates of Summer Sessions at which work will be taken; and (3) the college at which the courses will be pursued.

Application form may be used by present pharmacy freshmen at the University of Minnesota. Additional copies are obtainable at the college office, 101 Wulling Hall. Other students in the University should also obtain forms for change of college at Window 16, Office of Admissions and Records. Students enrolled under the joint registration plan or those requesting admission with advanced standing from other institutions may obtain other necessary application forms from the Office of Admissions and Records, University of Minnesota, Minneapolis 14.\*

#### PROSPECTIVE STUDENTS

During the postwar emergency in veterans' education, certain restrictions apply of necessity to consideration of persons resident outside of Minnesota. For current information regarding the ruling on nonresidents see the *General Information Bulletin* of the University, or write to the Office of Admissions and Records.

All applicants for admission, either with or without advanced standing, should request the high schools or colleges they attended to send complete transcripts of their records to the Office of Admissions and Records of the University as soon as possible. A student's credentials will not be reviewed unless a completed official application form (obtained from the Office of Admissions and Records) has been filed by him with the Office of Admissions and Records. The submitting of an Application for Admission form does not obligate a student to enroll in the University. As soon as an applicant's official transcript has been reviewed, he will be notified of his admission status and directions for registration will be sent to him.

It is recommended that those students who are still in high school and who contemplate making application for admission to the College of Pharmacy upon their graduation include in their high school courses bookkeeping, higher algebra, solid geometry, trigonometry, botany, chemistry, physics, and physiology.

Students who have graduated from high school and wish to complete the first year of the pharmacy curriculum at another college or university and enter here upon the professional pharmaceutical work of the sophomore year should arrange their programs so as to include all subjects listed in the first year of the curriculum on page 10. Those students who have had one unit of higher algebra and/or one-half unit of trigonometry in high school, should refer to footnote (†) on page 10 before entering another college or university to complete the required subjects of the first year of the pharmacy curriculum. See Admission to the Professional Work of the Sophomore Year in Pharmacy, page 3.

A review of the pharmacy curriculum will show it to be comprised of 208 credit hours of work in professional, scientific, and pharmacy administration courses (most of it required) of which approximately 50 per cent is laboratory instruction. It follows that if a student is to do creditably in his studies, he is precluded from engaging in outside work which will interfere with his application and study both in and out of school. A student who finds it necessary to wholly or partially support himself is advised to take five years or more to complete the work of the four-year

\* NOTE: It is the responsibility of these students to submit to the Office of Admissions and Records complete official transcripts, indicating honorable dismissal, at the conclusion of all work at any other college or university. Final action on each such admission will be deferred pending receipt of this material.

course. Arrangements to do this can be made with the dean or chairman of the Students' Work Committee.

#### ADVANCED STANDING STUDENTS

Applicants for advanced standing must pass the entrance examinations or present the usual equivalents. They must furnish satisfactory evidence of time spent and subjects covered in previous professional studies at an accredited institution, and must pass the examinations of all departments in which they desire credit, if such examinations are deemed necessary by the professors in charge.

#### ADULT SPECIAL STUDENTS

Persons of mature age and experience (generally 24 years of age or older) who desire a specific and limited course of study and who are not at present candidates for an undergraduate degree, or persons who hold Bachelor degrees, may, upon approval of the dean of the college concerned, be admitted as adult special students. An adult special student may not become a candidate for a degree without the approval of his college, nor will advanced standing be allowed while the student is in the adult special classification. Applicants as adult specials are subject to the ruling on residency. Registered pharmacists who desire to pursue the work of any one or more of the courses offered in the curriculum may do so with the approval of the dean.

#### EXAMINATIONS AND STANDING

Examinations are held during the last week of each quarter, and are supplementary to the written and practical tests that are held at frequent intervals during the year and, with them, form largely the basis of final determination of fitness for promotion or graduation. (See graduation requirements, page 6.)

The standing of students is indicated by the letters A, B, C, D (A, highest, D, lowest passing mark), I (incomplete), and F (failure). The grade of I (incomplete) is a temporary grade indicating that a student has a satisfactory record in work completed and, for justifiable reasons satisfactory to the instructor in charge, was unable to complete the work of the course. Any student receiving this grade is required to complete the work of the course within the first thirty days of his next quarter in residence. A grade of I (incomplete) which is not removed within the first thirty days of the student's next quarter in residence will be marked canceled without grade. An extension of time may be permitted for removal of incomplete grades upon recommendation of the instructor concerned and approval of the Students' Work Committee of the college in which the student is registered. If a petition is presented after the end of the thirty-day period, a restoration of the mark of incomplete may be permitted by the Students' Work Committee of the college concerned upon the recommendation of the instructor but removal of incomplete would be considered in the nature of a special examination for which a fee of \$5 is required.

Absences will not be excused unless satisfactory reasons are given. Habitual absence without a satisfactory excuse, continued indifference to study, or persistently poor scholarship may subject the student to probation or temporary or permanent suspension.

#### FEES AND EXPENSES

For a detailed statement of fees and expenses, see *Bulletin of General Information*.



**GRADUATION REQUIREMENTS**

An over-all "C" average in the required and elective courses in the curriculum is a requirement for graduation. In addition, all candidates for the degree of bachelor of science in pharmacy to be conferred on or after June, 1949, are required to pass a comprehensive examination covering the four years of work as set forth in the curriculum. The comprehensive examination will be given during the spring quarter final examination period.

A student who has met all other requirements for graduation but has failed in the comprehensive examination is eligible for re-examination during the week immediately preceding any subsequent announced commencement. Application for re-examination must be made at the college office not less than fifteen days prior to the particular examination he wishes to take. A fee of \$5 is charged for each re-examination.

**PHARMACY LAW REQUIREMENTS**

Section 10 of the pharmacy laws of the State of Minnesota, as amended by the Legislature on March 28, 1941, reads as follows :

To be entitled to examination by the State Board of Pharmacy as a pharmacist, the applicant shall be a citizen of the United States, of good moral character, at least twenty-one years of age, and shall be a graduate of the College of Pharmacy of the University of Minnesota or of a college or school of pharmacy in good standing, of which the Board shall be the judge, and shall have at least one year of practical experience in a pharmacy.

On July 18, 1941, the Minnesota State Board of Pharmacy issued the following regulation on above passage :

Only graduates of the College of Pharmacy of the University of Minnesota and graduates of other schools and colleges of pharmacy accredited by the American Council on Pharmaceutical Education will be eligible for licensure examination.

The College of Pharmacy is not only specifically named in the law but it is also accredited by the American Council on Pharmaceutical Education.

In January, 1940, the Minnesota State Board of Pharmacy issued a regulation to the effect that an official or certified transcript of scholastic work must accompany the application for examination for licensure to practice pharmacy in this state. Transcripts of Minnesota graduates may be obtained from the Office of Admissions and Records of the University. Requests for transcripts should be made not later than ten days prior to the date upon which the application is to be filed with the Board of Pharmacy. No person will be charged for the transcript unless three transcripts have been issued previously to him. A fee of 50 cents will then be charged.

In order that practical experience obtained as an apprentice during summer vacations may be credited toward the year of practical experience required by law, a student must file two statements with the Board of Pharmacy, one form showing the date such apprentice began his experience, and another showing the date on which it ended, this regardless of the length of time employed. These forms may be obtained from the secretary of the Minnesota State Board of Pharmacy. A complete file of those registered pharmacists who have signified their willingness to serve as preceptors is available in the office of the dean.

**MINNESOTA STATE BOARD OF PHARMACY**

The State Board of Pharmacy meets at the college at least twice each year to examine candidates for registration. For information concerning all matters coming under the jurisdiction of the State Board, address Secretary of the Minnesota State Board of Pharmacy, 3965 Minnehaha Avenue South, Minneapolis 6, Minnesota.

### MEDICINAL PLANT LABORATORY AND GARDEN

The facilities of the medicinal plant garden, plant laboratory, and conservatory afford opportunity for instruction in methods of cultivating, collecting, preparing, drying, and milling many official and nonofficial drugs. Approximately five hundred species of plants of medicinal and economic importance grown in the garden and greenhouses provide ample and varied material for study of the gross anatomical, histological, and chemical characteristics of these plants, for the preparation of herbarium specimens, for research in medicinal plant cultivation, etc.

### PHARMACEUTICAL MILITARY SCIENCE AND TACTICS

#### *Elective Course*

On July 1, 1948, a Pharmacy Reserve Officers Training Corps unit was established at the College of Pharmacy as a component of the Department of Military Science and Tactics, University of Minnesota, by the Department of the Army, General Orders, No. 34, dated May 20, 1948.

This elective course in Pharmaceutical Military Science is given by an officer of the Medical Service Corps of the Army, detailed by the Surgeon General. It is a progressive course of four years, with 32 hours of instruction annually, arranged as an hour conference or weekly lecture.

Any male citizen who is regularly enrolled in the College of Pharmacy and who meets the physical and other requirements for an Army Reserve Commission is eligible to take the course. Students who hold commissions in Army Reserve units are eligible, but members of the Navy or Marine Corps Reserve cannot be officially enrolled unless they resign such commissions. Students who have been honorably discharged after more than six months of active service with any component of the Armed Forces may elect exemption from the first year of instruction and those with more than 12 months of honorable service may elect exemption from the first two years of instruction.

No uniform is worn, there are no drill periods, and the only obligation incurred is to complete the advanced course if started and to accept a commission if offered. Admission to the advanced Pharmacy ROTC course will be limited to those who have maintained a satisfactory scholastic standing during their freshman and sophomore years and who have made satisfactory progress in the basic Pharmacy ROTC courses. There is a six-week camp at Fort Sam Houston, Texas, during the summer after the second or third year of instruction; or a student may in exceptional cases attend the summer camp after graduation from the University. The student receives a monthly stipend from the government during the last two years, and is paid for camp attendance and transportation to and from the camp. On receiving his degree in pharmacy, the graduate of this course in Pharmaceutical Military Science will receive a commission in the Medical Service Corps Reserve.

This course is designed to supplement the regular pharmacy curriculum so that the pharmacy graduate may be better qualified in case of national emergency, thus benefiting his country and himself.

For further information see description of courses on page 18.

### SPECIAL LECTURES

From time to time throughout the school year, outstanding men in the fields of pharmacy and related sciences address the students of the College of Pharmacy. Students are required to attend.

**MELENDY MEMORIAL LECTURES**

Annually some pharmacist of national reputation delivers a lecture at the College of Pharmacy on a subject intended to advance the interests of the profession. This lectureship has been made possible by the Samuel W. Melendy Memorial Fund.

**PHARMACEUTICAL EDUCATION TRIP**

Once during the academic year, usually during the spring vacation, an opportunity is afforded students in the College of Pharmacy to visit the laboratories of at least one pharmaceutical and/or biological manufacturer. Students are urged to make at least one of these trips at some time during their four years in college.

**ELECTIVES IN OTHER COLLEGES OF THE UNIVERSITY**

All of the facilities of the University are open to students of this college. Therefore, students having the necessary prerequisites may elect subjects in other colleges of the University, if such election does not interfere with the required work in the College of Pharmacy. Subjects elected must be approved by the dean.

**TEXTBOOKS**

Textbooks used in all courses may be obtained after coming to the University.

**SCHOLARSHIPS, FELLOWSHIPS, AND PRIZES**

**Scholarships\***—Open to veterans† and undergraduate students regularly enrolled in the College of Pharmacy.

One \$225 Minnesota State Pharmaceutical Association Scholarship and a token is awarded to that student who is a citizen of the United States and who has earned the highest general average rating at the completion of the first two years of professional pharmaceutical work up to ten days before Cap and Gown Day and who intends to become a candidate for the degree B.S. in Phm. from this college. If the student receiving this award should fail to return to the college the following year to complete his senior work, the said sum will be awarded to the student next highest in standing who also meets the other requirements.

Three \$200 Samuel W. Melendy Scholarships are available to sophomore students in the College of Pharmacy.

Three \$200 Samuel W. Melendy Scholarships are available to junior students.

Three \$200 Samuel W. Melendy Scholarships are available to senior students.

The bases upon which these scholarships are awarded are: (1) outstanding scholarships in academic and professional courses of study of the preceding year; and (2) character, personality, and general outstanding qualities of leadership.

**Fellowships§**—Open to graduate students with majors in pharmaceutical chemistry or pharmacognosy in the College of Pharmacy, University of Minnesota.

One \$500 Minnesota State Pharmaceutical Association Fellowship, with exemption from tuition, open to sufficiently qualified graduates of the College of Pharmacy of the University of Minnesota.

Three \$1,000 Samuel W. Melendy Memorial Fellowships, without exemption from tuition, to be offered annually. The major study must be in pharmaceutical chemistry or pharmacognosy and full time devoted to graduate study and research.

Graduate fellowships have been made available by the American Foundation for Pharmaceutical Education to graduate students majoring in pharmaceutical

\* Applications for scholarships should be made to the dean of the College of Pharmacy.

† Awards to veterans will be based upon their scholarship during the last year they were in attendance before entering the service.

§ Applications for fellowships should be made to the office of the Graduate School and applications for scholarships should be made to the dean of the College of Pharmacy.

subjects. Applications for such fellowships should be made directly to the American Foundation for Pharmaceutical Education, 1450 Broadway, New York City.

**Prizes—Kappa Epsilon Prize**—The Alumnae Chapter of Kappa Epsilon, national pharmacy sorority, offers the interest on \$425 as a prize to the Kappa Epsilon student who has earned the highest scholastic average at the end of four years. The sum is to be used to defray the expenses of the State Board examination and registration.

**Lehn and Fink Gold Medal**—Lehn and Fink Products Corporation, of New York City, awards annually a gold medal to that student in the College of Pharmacy who graduates with the degree, B.S. in Phm., and who has earned the highest general average rating during the four years of undergraduate study.

**Wulling Club Key**—The Wulling Club of the College of Pharmacy awards annually an appropriate gold key to that student in the College of Pharmacy who graduates with the degree, B.S. in Phm., and who has earned the second highest general average rating during the four years of undergraduate study.

**Merck Award**—Merck and Company, Inc., manufacturing chemists of Rahway, New Jersey, offers annually the Merck Award to that senior student in the College of Pharmacy who has earned the highest scholastic average in the three years of professional work. This award consists of the *Merck Index*, *Merck Manual*, and *Reagent Chemicals and Standards*.

**Rho Chi Award**—Mu Chapter of the Rho Chi Society, a national honorary pharmacy organization, annually presents to the highest ranking sophomore student a membership for one year in the American Pharmaceutical Association. This includes a one-year subscription to the *Journal of the American Pharmaceutical Association*.

#### COMMUNICATIONS

Correspondence relating to registration or advanced standing should be addressed to the Office of Admissions and Records, University of Minnesota, Minneapolis 14. Official transcripts for advanced standing will be evaluated by the Office of Admissions and Records only when accompanied by a completed Application for Admission form. All other inquiries should be addressed to Office of the Dean, College of Pharmacy, University of Minnesota, Minneapolis 14.

## COURSES OF STUDY

The College of Pharmacy offers one four-year course in Pharmacy and one optional combined course in Pharmacy and Business Administration.

The Graduate School offers courses in pharmaceutical chemistry and pharmacognosy. (See *Bulletin of the Graduate School.*)

### Four-Year Course

The College of Pharmacy offers one undergraduate course of four years' duration leading to the degree of bachelor of science in pharmacy. This course includes one year of work in certain subjects in the College of Science, Literature, and the Arts, or other college of equal standing.

Course	FIRST YEAR		
	Fall	Winter	Spring
*Botany 1-2 .....	3	3	.....
Inorganic Chemistry 6-7, 12 .....	5	5	5
Composition 4-5-6 .....	3	3	3
†Mathematics 1, 6 .....	.....	5	5
Public Health 3 .....	.....	.....	2
§Military Science and Tactics 1-2-3 .....	0	0	0
Pharmacy 1 .....	2	0	0
Total .....	13	16	15
	SECOND YEAR		
Pharmacy 2, 3 .....	1	.....	3
Pharmaceutical Chemistry 1-2 .....	4	4	.....
Pharmacognosy 1-2-3 .....	2	2	3
Anatomy 5 .....	.....	.....	5
Organic Chemistry 61-62 .....	4	4	.....
Physics 1a-2a-3a .....	4	4	4
Zoology 14-15 .....	3	3	.....
Economics 10 .....	.....	.....	3
§Military Science and Tactics 4-5-6 .....	0	0	0
Total .....	18	17	18
	THIRD YEAR		
Pharmacy 54-55-56 .....	5	5	5
Pharmaceutical Chemistry 161-162-163 .....	3	3	4
Pharmacognosy 54 .....	3	.....	.....
Pharmacognosy 55-56-57 .....	3	3	3
Pharmacy 57 .....	1	.....	.....
Physiology 4 .....	4	.....	.....
Bacteriology 53 .....	.....	5	.....
Economics 30 .....	.....	3	.....
Business Administration 67 .....	.....	.....	3
Public Health 51 .....	.....	.....	3
§Military Science and Tactics 151-152-153 .....	0	0	0
Total .....	19	19	18

\* A student who is pursuing the first year of the pharmacy curriculum at some accredited institution, other than the University of Minnesota, must present a minimum of six quarter credit hours of botany to meet this requirement. Also, a course in Public Health 3 is offered by correspondence for such students.

† A student who has completed (1) one unit of high school higher algebra and/or (2) one-half unit of high school trigonometry must take elective subjects as follows: (1) Math. 1, Higher Algebra, may substitute Math. 7, College Algebra (5 cred.), or 5 credits of electives approved by the Students' Work Committee; (2) higher algebra and trigonometry may take Math. 15 and 16 (10 cred.) or 10 credits of electives approved by the Students' Work Committee.

§ Elective: Three quarter credits in Pharmacy ROTC may be used toward ten quarter credits of electives in the freshman year.

FOURTH YEAR

Course	Credits		
	Fall	Winter	Spring
Pharmacy 58-59-60 .....	5	4	4
Pharmacy 64 .....	.....	.....	2
Pharmacy 65 .....	2	.....	.....
Pharmacy 70 .....	1	.....	.....
Pharmacy 71 .....	.....	.....	3
Pharmaceutical Chemistry 54-55 .....	5	5	.....
Pharmaceutical Chemistry 53 .....	.....	.....	5
Pharmacognosy 59 .....	.....	.....	3
Pharmacology 101-105-106 .....	2	6	2
¶Professional electives .....	.....	3	3
§Military Science and Tactics 154-155-156 .....	0	0	0
Total .....	15	18	22
Grand Total .....	65	70	73 208

**Optional Combined Course in Pharmacy and Business Administration**

The College of Pharmacy and the School of Business Administration offer an optional combined course in Pharmacy and Business Administration leading to the degrees of bachelor of science in pharmacy and bachelor of business administration. This optional course is open only to those students who register in the College of Pharmacy either with or without advanced standing and who can present evidence of better than average ability. Requirements for these degrees are: (1) the completion of all courses, except Economics 10 and 30 listed in the four-year course in Pharmacy; and (2) completion of the following courses in Business Administration:

	Credits
Economics 8-9 (General Economics) .....	6
Economics 28 (Business Law) .....	3
Economics 22-23 (Principles of Accounting) .....	8
B.A. 58 (Elements of Public Finance) .....	3
B.A. 70 (Statistics Survey) .....	3
B.A. 89 (Production Management) .....	3
B.A. 77 (Survey in Marketing) .....	3
B.A. 67 (Retail Store Management for Pharmacy Students) .....	3
B.A. 130 (Cost Accounting Survey) .....	3
B.A. 112 (Business Statistics) .....	3
Economics 142 (Monetary and Banking Policy) .....	3
B.A. 88 (Advertising) .....	3
B.A. 155 (Corporation Finance) .....	3
B.A. 180-181-182C (Senior Topics: Marketing) .....	9
Economics 149 (Business Cycles) .....	3
Economics 161 (Labor Problems and Trade Unionism) .....	3
Economics 80-81 (Intermediate Economic Analysis) .....	6
Total five years .....	68

§ Elective: Three qtr. cred. in Pharmacy ROTC may be used toward 10 qtr. cred. of electives in the freshman year.

¶ Professional electives:

1. Pharmacy 66-67 (Pharmaceutical Manufacturing), 6 credits
2. Pharmacy 68-69 (Hospital Pharmacy), 6 credits
3. Pharmaceutical Chemistry 164-165 (Special Analytical Methods), 6 credits
4. Pharmacognosy 60-61 Pharmacognosy and Pharmacology-Histology), 6 credits
5. Pharmacognosy 162 (Biological Assay of Drugs), 3 credits. (Students who elect biological assay of drugs as their professional elective for the winter quarter must take insecticides and fungicides for their spring quarter professional elective.)
6. Pharmacognosy 164 (Insecticides and Fungicides), 3 credits
7. Pharmacy 72 (Veterinary Products), 3 credits. Lecture course only; three lectures a week. (Students who elect veterinary products as their professional elective for the winter quarter must take insecticides and fungicides for their spring quarter professional elective.)
8. Elementary Organic Chemistry 63, 64, 5 credits. (See page 16.)

No credit will be given for professional electives 1, 2, 3, 4 until the work of the two quarters in the same elective is completed.

If the professional and administration courses are taken concurrently, it is estimated that between five and six academic years will be necessary to meet the requirements for both of these degrees. There is the possibility that by taking business administration courses during the terms of Summer Session, the time necessary to meet the requirements for these degrees could be reduced to the minimum (five years).

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## DESCRIPTION OF COURSES

### Courses Offered in the College of Pharmacy

Following each course is a statement in parentheses of credits, number of lectures and laboratory hours per week, classes of students eligible, and prerequisites. Thus (4 cred.; sr.; prereq. Pharm. 56; 2 lect. and 6 lab. hrs. per wk.) means the course offers 4 credits; is open to seniors; that Pharmacy 56 is a prerequisite; and carries 2 lectures and 6 hours of laboratory per week.

All sophomores, juniors, and seniors are required to purchase a \$5 Pharmacy Deposit Card from the bursar. Pharmacy course fees, breakage, and supplies will be deducted from these cards.

### PHARMACY

Professors Charles V. Netz, Ph.D., Head; Charles H. Rogers, Sc.D.; Professor Willard J. Hadley, Ph.D.; Assistant Professor Ragnar Almin, M.S.; Chief Pharmacist Hallie Bruce, Phm.G.; Special Lecturers Richard H. Bachelder, LL.B., John R. Hartmann, Director of Safety, Minnesota Chapter, American Red Cross; Graduate Assistants; Student Pharmacist Supervisors Stewart Brokaw, B.S. in Phm., Harold Rafferty.

- 1f. Orientation. General survey of pharmacy and related sciences. Includes: (1) university environment and student activities; (2) Minnesota Pharmacy Law; (3) State Board regulations; (4) the Minnesota Preceptor Plan; (5) use of library, catalogs, periodical indexes and pharmaceutical reference books; (6) aims and accomplishment of state and national pharmaceutical, medical, chemical, and educational organizations. (2 cred.; fr., soph.; no prereq.; 2 lect. hrs. per wk.) Rogers
- 2f. Pharmaceutical Latin. Latin and Latinized words and constructions commonly encountered in pharmaceutical practice. (1 cred.; soph.; no prereq.; 1 lect. hr. per wk.) Almin
- 3s. Pharmaceutical Calculations. Weights and measures, balances, thermometry, specific gravity, calculations of doses, and percentage and stock solutions. (3 cred.; soph.; no prereq.; 3 lect. hrs. per wk.) Netz
- 54f-55w-56s. Pharmaceutical Preparations.
  - Pharm. 54f—Waters, infusions, decoctions, syrups, honeys, solutions, injections, lotions, magmas, gels, and mixtures.
  - Pharm. 55w—Spirits, elixirs, tinctures, fluidextracts, extracts, powders, mucilages, glycerites, soaps, liniments, collodions, and sprays.
  - Pharm. 56s—Resins, oleoresins, plasters, petroxolins, ointments, cerates, pastes, jellies, emulsions, effervescent salts, suppositories, masses, pills, tablets, troches, dental and cosmetic preparations. (15 cred.; jr.; prereq. 2, 3, Pharm.Chem. 2; 3 lect. and 6 lab. hrs. per week per qtr.) Hadley

- 57f. History of Pharmacy. Development of pharmacy from 1500 B.C., including pharmaceutical literature, education, legislation, and organizations. (1 cred.; jr.; no prereq.; 1 lect. hr. per wk.) Almin
- 58f-59w-60s. Prescription Compounding. Compounding and dispensing of prescriptions written in actual medical practice with special attention to incompatibilities. (13 cred.; sr.; prereq. Pharm.Chem. 2, Pharmacog. 57, Pharm. 56, Pharm.Chem. 163; fall: 3 lect. and 6 lab. hrs. per wk., winter: 2 lect. and 6 lab. hrs. per wk., spring: 2 lect. and 6 lab. hrs. per wk.) Netz, Almin
- 64s. Pharmaceutical Jurisprudence. Principles of law and legal procedure, legal duties, and public responsibilities of the retail pharmacist; analysis of federal and Minnesota state laws and regulations affecting pharmacy; common legal problems of practical importance to the pharmacist. (2 cred.; sr.; no prereq.; 2 lect. hrs. per wk.) Bachelder
- 65f. Cosmetics. Composition and methods of manufacture of powders, creams, lotions, soaps, and other cosmetic products. (2 cred.; sr.; prereq. 56, Org.Chem. 62; 2 lect. hrs. per wk.) Netz
- 66w-67s. Pharmaceutical Manufacturing. Problems involved in the production of pharmaceutical preparations on a large scale. Manufacture, coating, and polishing of compressed tablets, milling of ointments, preparation of granulations, solutions, fluidextracts, etc. Registration limited. Professional elective. (6 cred.; sr.; prereq. 56; 1 lect. and 6 lab. hrs. per wk.) Almin
- 68w-69s.\* An Introduction to Hospital Pharmacy. Training for those who expect to practice in a hospital pharmacy. Includes hospital administration and procedure, instruction in purchasing supplies (drugs, rubber goods, surgical supplies, etc.), stock control, records, manufacture of pharmaceutical preparations, prescriptions, and the preparation of parenteral solutions and allergenic extracts. Registration limited. Professional elective. (6 cred.; sr.; prereq. 58; 1 lect. and 6 lab. hrs. per wk.) Bruce
- 70f. First Aid. The standard American Red Cross First Aid course. (1 cred.; sr.; no prereq.; 1 lect. hr. per wk.) Hartmann
- 71s. Pharmaceutical Specialties. New drugs, medicinal preparations, and sickroom supplies. Lectures by representatives of pharmaceutical manufacturers. (3 cred.; sr.; prereq. Pharm.Chem. 163; 3 lect. hrs. per wk.) Soine
- 72w. Veterinary Products. Chemical, pharmaceutical, and pharmacological study of therapeutic agents used in the prevention and treatment of disease in domestic animals and poultry. Professional elective. Students who elect this course must take Pharmacog. 165 (Insecticides and Fungicides) spring quarter. (3 cred.; sr.; prereq. 56; 3 lect. hrs. per wk.) Hadley
- 73f,w,s. Special Problems. Prescription incompatibilities and problems in formulation of pharmaceuticals and their manufacture in small and large quantities. (Cred. ar.; sr.; prereq. 56, Pharm.Chem. 163.) Netz, Hadley, Almin

### PHARMACEUTICAL CHEMISTRY

Professors Ole Gisvold, Ph.D., Head, Charles H. Rogers, Sc.D.; Associate Professors Frank E. DiGangi, Ph.D.; Taito O. Soine, Ph.D.; Graduate Assistants; Student Pharmacist Supervisor William Trumm, B.S. in Phm.

\* At the conclusion of the spring quarter, students who have completed the Course 68w-69s are offered the opportunity to acquire an additional two weeks' full-time training in the dispensary of the University Hospitals. No fee will be charged for this extra instruction, neither will there be any financial remuneration nor scholastic credit given for it.



- 1f-2w. Inorganic Pharmaceutical Products. Histories, sources, commercial methods of manufacture, laboratory preparation, properties, and uses of inorganic chemicals. (8 cred.; soph.; prereq. Semimicro Qual.Anal. 12 or equiv.; 2 lect. and 6 lab. hrs. per wk.) Soine
- 53s. Pharmaceutical Biochemistry. Constituents of normal and pathological urine; some of the therapeutic agents excreted in urine; the normal constituents of the blood and the effect of pathological conditions upon these constituents. Qualitative and quantitative tests for abnormal constituents in urine; erythrocyte and leucocyte counts, blood typing, and other clinical determinations. (5 cred.; sr.; prereq. Org.Chem. 62; 3 lect. and 6 lab. hrs. per wk.) DiGangi, Fischer
- 54f-55w. Quantitative Pharmaceutical Chemistry. Principles, methods, and procedures of gravimetric, volumetric, and oxidation-reduction methods of analyses of inorganic and organic pharmaceutical products. (10 cred.; sr.; prereq. Semimicro Qual.Anal. 12, Org.Chem. 62, Pharm.Chem. 2; 3 lect. and 6 lab. hrs. per wk.) DiGangi
- 161f-162w-163s. Organic Pharmaceutical Products. Sources, methods of production, properties, reactions, relationships of structures to activity, and uses of the natural and synthetic organic compounds. (10 cred.; jr., sr., grad.; prereq. Org.Chem. 2; fall, winter: 3 lect. hrs., spring: 4 lect. hrs. per wk.) Gisvold
- 161f—Hydrocarbons, halogenated hydrocarbons, alcohols, aldehydes, ketones, acids, phenols, tannins, ethers, and esters.
- 162w—Organometallics (i.e. mercurials, silver compounds, arsenicals, bismuth compounds), dyes, surface active agents, miscellaneous antiseptic agents, sulfonamides, and antibiotics.
- 163s—Analgesics, pressor principles, myotics, mydriatics, antispasmodics, local anesthetics, barbiturates and related compounds, alkaloids, cardiac glycosides, sex hormones and structurally related compounds, and vitamins.
- 164w-165s. Special Analytical Methods. The Food, Drug, and Cosmetic Act and many of the official analytical methods of the U.S.P., N.F., and the A.O.A.C. The laboratory work consists of the analyses of some drugs and foods. Professional elective. Students contemplating graduate work with a major in pharmaceutical chemistry and a minor in organic chemistry should elect Course 164 (3 cred.) for their winter professional elective and Org.Chem. 63 (3 cred.) and 64 (2 cred.) for their spring quarter professional elective. (6 cred.; sr., grad.; prereq. Pharm.Chem. 2, 54, Org.Chem. 62; 1 lect. and 6 lab. hrs. per wk.) DiGangi or Soine

### PHARMACOGNOSY

Professor Earl B. Fischer, Ph.D., Head; Associate Professor Wallace F. White, Ph.D.; Assistant Professor \_\_\_\_\_; Graduate Assistants; Gardener George Balok.

- 1f-2w-3s. Vegetable Drug Histology. The microscopic structure of vegetable drugs including cell contents, cell forms, and types of tissues used in identifying and detecting adulteration in such products. Also the development, function, and nature of plant parts which furnish vegetable drugs. (7 cred.; soph.; prereq. Bot. 2; fall: 1 lect. and 3 lab. hrs. per wk., winter: 1 lect. and 3 lab. hrs. per wk., spring: 2 lect. and 3 lab. hrs. per wk.)
- 54f. Drug Collection and Medicinal Plant Study. Methods of cultivating and preparing crude drugs from medicinal plants grown in the University of Minnesota medicinal plant garden. The characteristics of living plants which produce

- vegetable drugs are studied together with methods of evaluating the latter, factors which influence their quality and the production of volatile oils. (3 cred.; jr.; prereq. 3, Bot. 2; 3 lect. and 6 lab. hrs. per wk.) Fischer
- 55f-56w. Identification and Medicinal Properties of Vegetable Drugs. The identification, nature, and therapeutic properties of U.S.P. and N.F., and some of the more important nonofficial vegetable drugs. Emphasis is placed upon doses and evaluation of the vegetable drugs as therapeutic agents. The pharmacodynamic actions of the less frequently used vegetable drugs are considered. (6 cred.; jr.; prereq. 3, Bot. 2; 3 lect. hrs. per wk. per qtr.) White
- 57s. Antibiotics and Glandular Products. The development, production, methods of assay and standardization and medicinal uses of important antibiotics such as penicillin, streptomycin, tyrothricin, aureomycin, etc. Important glandular products, chiefly those derived from endocrine glands, are considered with reference to the location and function of the glands in the body, and methods of preparation, assay and standardization of their active principles, and their uses in the treatment of disease arising from glandular or hormone deficiencies. (3 cred.; jr.; prereq. 2, Physiol. 4, Anat. 5; 3 lect. hrs. per wk.) White
- 59f. Biological Products. The preparation, standardization, and medicinal and pharmaceutical properties of important biological preparations such as modified virus and bacterial vaccines, antitoxins, immune serums, toxoids, tuberculins, normal serums, blood plasma, diagnostic biological reagents, etc. (3 cred.; sr.; prereq. Bact. 53; 3 lect. hrs. per wk.) Fischer
- 60w-61s. Pharmacognosy and Pharmaco-Histology. Continuation of Course 3 for students wishing to elect further work in this field. The microscopic appearance, structure, and function of drug tissues, cells and cell contents is considered by means of which the identity and purity of vegetable drugs are determined. Microscopical accessories such as the micropolariscope, microtome, microphotographic camera are used. Registration limited. Professional elective. (6 cred.; sr.; prereq. 54; 1 lect. and 6 lab. hrs. per wk.) Fischer
- 162w. Biological Assay of Drugs. Didactic and laboratory consideration of biological assays of vegetable and animal drugs of the U.S.P. and N.F. Registration limited. Professional elective. Students who elect Course 162 as their professional elective must take 164 (Insecticides and Fungicides) for their spring quarter professional elective. (3 cred.; sr., grad.; prereq. 57, Pharm.Chem. 55; 1 lect. and 6 lab. hrs. per wk.) White
- 164s. Insecticides and Fungicides. The principal types of insects and fungi which attack farm and garden crops or cultivated medicinal plants or which may be injurious in the household. Consideration is given to methods and substances used for the prevention or control of damage caused by such insects and diseases. Professional elective. (3 cred.; sr., grad.; prereq. 56; 3 lect. hrs. per wk.) Fischer

### Courses Included in the Pharmacy Curriculum and Offered by Other Departments of the University

#### ANATOMY

- Professor Edward A. Boyden, Ph.D., Head; Instructor Ronald M. Ferry, Jr., M.D.
- 5s. General Survey Course in Human Anatomy. For pharmacy students. (5 cred.; soph.; prereq. Zool. 14-15; 4 lect. and 4 lab. hrs. per wk.) Ferry

**BACTERIOLOGY AND IMMUNOLOGY**

Professor Jerome T. Syverton, M.D., Head.

53f,w,s,su.† General Bacteriology. Lectures, demonstrations, and laboratory exercises are employed for instruction in the morphology, physiology, taxonomy, and ecology of bacteria. The practical applications of these fundamental principles in other phases of science and industry are emphasized. (5 cred.; soph. with a C average in the prerequisite courses, jr., sr.; prereq. 10 cred. in chem. and 4 cred. in biological sciences, or permission of instructor)

**BOTANY**

Professor A. Orville Dahl, Ph.D., Chairman.

1f-2w. General Botany. A survey lecture and laboratory course on plants; characteristics of living matter; fundamental facts of growth, structure, and reproduction; principles of inheritance; relations of plants to their environment. (6 cred.; fr.; no prereq.) Banks, Hall, and assistants

**CHEMISTRY: INORGANIC**

Professor M. Cannon Sneed, Ph.D., Chief; Associate Professor Thomas D. O'Brien, Ph.D.; and assistants.

6f-7w. General Inorganic Chemistry. A study of the general laws of chemistry and of the nonmetals, metals, and their compounds. (10 cred.; fr.; no prereq.) (Credits earned in Inorg.Chem. 9 and 10 are accepted in lieu of Inorg.Chem. 6-7.) O'Brien and assistants

12s.\* Semimicro Qualitative Analysis. Laboratory work in systematic qualitative analysis of the cations with lectures on solutions, ionization, chemical and physical equilibria, oxidation, and reduction, etc. (5 cred.; prereq. 7 or 10.) Sneed and assistants

**CHEMISTRY: ORGANIC**

Professors Lee I. Smith, Ph.D., Chief, Walter M. Lauer, Ph.D., Richard T. Arnold, Ph.D., C. Frederick Koelsch, Ph.D.; Associate Professors Raymond M. Dodson, Ph.D., William E. Parham, Ph.D.

61f,w,su\*-62w,s,su.\* Elementary Organic Chemistry. Discussion of important classes of organic compounds, both aliphatic and aromatic. Laboratory work includes the preparation of typical substances. (8 cred.; pharm., premed., predent.; prereq. Inorg.Chem. 12 or 11.) Arnold, Koelsch, Dodson, and assistants.

63f,s. Elementary Organic Chemistry. Lecture course. Discussion of the important classes of organic compounds, both aliphatic and aromatic, together with some heterocyclic compounds. Courses 63 and 64 are prerequisite to all other advanced courses in organic chemistry. Those senior pharmacy students who contemplate pursuing graduate work with a major in pharmaceutical chemistry and a minor in organic chemistry must elect this course and Course 64 as their professional elective of the spring quarter. Those students who contemplate

\* The student should purchase a \$5 chemistry deposit card from the bursar in the Administration Building. No student will be assigned a desk in the laboratory until he presents this card. The course fee, laboratory material, and breakage will be charged against this deposit.

† Microscope required. Students may obtain use of microscope by purchasing \$3 microscope cards from the bursar.

pursuing graduate work and intending to obtain a minor in organic chemistry must have completed, before their preliminary examination, Phys.Chem. 101, 102, 103, 104, 105, and 106. In the case of a split minor in organic chemistry, Phys.Chem. 107 and 108 will have to be completed before their preliminary examination. (3 cred.; 3 lect. hrs. per wk.) Parham

64f.s.\* Elementary Organic Chemistry. Laboratory course. To accompany Course 63. Preparation of typical substances, some original work. Must be accompanied or preceded by Course 63. (3 cred.; 1 lect. and 6 lab. hrs. per wk.) Parham and assistants.

## ECONOMICS AND BUSINESS ADMINISTRATION

### ECONOMICS

Professor Richard L. Kozelka, Ph.D., Dean; Associate Professors Thomas M. Mullen, M.B.A., Roy E. Tuttle, M.B.A., Harry J. Ostlund, B.A.; and instructors.

Econ.10f. An Introduction to Economics. The organization of modern industry; the various forces that influence prices, such as consumer demand, cost, degree of competition or monopoly, the quantity and rate of circulation of money, etc. (3 cred.; open only to College of Pharmacy students; no prereq.) Ar.

Econ.30w. Elements of Retail Accounting. The principles of accounting applied to retail record keeping, adjustment, and closing of records. The construction and analysis of statements. (3 cred.; open only to College of Pharmacy students; no prereq.) Tuttle

### BUSINESS ADMINISTRATION

B.A.67s. Retail Store Management. The principles of retail store management, including the planning and control of store operation, the nature of consumer demand, and the analysis of retailing costs. (3 cred.; open only to College of Pharmacy students; prereq. Econ. 10 and 30.) Ar.

### ENGLISH

Professor Theodore Hornberger, Ph.D., Chairman; and instructors.

4f-5w-6s. Freshman Composition. (9 cred. per qtr.; fr.; prereq. placement test.)

### MATHEMATICS

Professor Raymond W. Brink, Ph.D., Chairman; and instructors.

1f,w,s. Higher Algebra. (5 cred.; prereq. one year of elementary algebra. Open for credit to any student offering not more than one-half year of high school higher algebra for entrance.) Ar.

6f,w,s. Trigonometry. (5 cred.; prereq. plane geometry and either Course 1 or high school higher algebra.) Ar.

7f,w,s. College Algebra. (5 cred.; prereq. 6 or high school trigonometry if approved by the department chairman.) Ar.

15f,w-16w,s. Elementary Mathematical Analysis. A course for pharmacy, pre-medical, and other students who desire a survey of college mathematics including trigonometry, algebra, and calculus with emphasis on fundamental ideas

\* The student should purchase a \$5 chemistry deposit card from the bursar in the Administration Building. No student will be assigned a desk in the laboratory until he presents this card. The course fee, laboratory material, and breakage will be charged against this deposit.

rather than on technical preparation for more advanced courses in mathematics. (10 cred.; prereq. plane geometry and either Course 1 or high school higher algebra.) Ar.

### MILITARY SCIENCE AND TACTICS

Professor C. H. Schabacker, B.S. USMA, Colonel, USA; Assistant Professor William C. Luehrs, B.S. in Phm., Captain, MSC.

- 1f-2w-3s. Pharmaceutical Military Science. Instruction stresses the organization of the army, military law, military training methods, military administration, courtesies and customs of the service, first aid, bandaging and splinting. (3 cred.; fr., soph.; no prereq.) Luehrs and assistant
- 4f-5w-6s. Pharmaceutical Military Science. A study of the organization of the Medical Department and consideration of the tactical and professional motives involved in providing ideal medical care to the military forces. Map reading and medical supply are also covered. (3 cred.; soph.; prereq. Pharm.M.S. 3, or 6 months of prior military service.) Luehrs and assistant
- 151f-152w-153s. Pharmaceutical Military Science. This course deals with pharmaceutical service in the army and duties of the pharmacy officer, including principles of military preventive medicine and Medical Department reports and records. (3 cred.; soph., jr.; prereq. Pharm.M.S. 6, or 12 months of prior military service.) Luehrs
- 154f-155w-156s. Pharmaceutical Military Science. A study of military personnel management, administration of military hospitals, and food service in the army. Medical aspects of atomic and chemical warfare are briefly reviewed. (3 cred.; jr., sr.; prereq. Pharm.M.S. 153.) Luehrs

### NAVAL ROTC

For complete information, see *Bulletin of General Information*.

### PHARMACOLOGY

Professor Raymond N. Bieter, M.D., Ph.D., Head; Professor Harold N. Wright, Ph.D.; Assistant Professor Elizabeth M. Cranston.

- 101f. Introduction to Pharmacology. The first course in a sequence in which drugs and related chemical compounds are presented for study from the standpoints of chemical structure, beneficial pharmacological actions or effects upon the living body and on living organisms, toxic or harmful effects, and their applications to the treatment of disease. (2 cred.; sr.; prereq. Physiol. 106, 107, or equiv.; 22 hrs.) Bieter, Wright, Cranston
- 105w. General and Experimental Pharmacology. A continuation of Course 101 with laboratory experiments and demonstrations. (6 cred.; sr.; prereq. 101; 110 hrs.) Bieter, Wright, Cranston
- 106s. General Pharmacology. A lecture continuation of Course 105. (2 cred.; sr.; prereq. 105; 22 hrs.) Bieter, Wright, Cranston

### PHYSICS

Professor J. William Buchta, Ph.D., Chairman; and instructors.

- 1af-2aw-3as. Introduction to Physical Science. Laboratory included. Lectures and experimental demonstrations of the principles underlying physical phenomena. (12 cred.; all; prereq. high school algebra and geometry.)

Students who contemplate going into graduate work in the physical or biological sciences should take Physics 4, 5, and 6 or 7, 8, and 9 in place of Physics 1a, 2a, 3a.

### PHYSIOLOGY

Professor Maurice B. Visscher, M.D., Ph.D., Head; and instructors.

4s. Human Physiology. Lecture, demonstrations, and quiz. (4 cred.; Pharm., SLA, H.Econ. and others; prereq. one qtr. zool., one qtr. chem.) Ar.

### SCHOOL OF PUBLIC HEALTH

Professor Gaylord W. Anderson, M.D., Dr.P.H., Director; Associate Professors Donald W. Cowan, M.D., M.S., Stewart C. Thomson, M.D., M.P.H.; and assistants.

3f,w,s. Personal Health. Elementary principles of normal body functions; 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 G.C. 10C, Human Biology, in General College.) Thomson

51f,w,s. Community Hygiene. Elementary concepts of development, spread, and prevention of preventable diseases; community programs for their control. (3 cred.; jr., sr.; prereq. 3 or Human Biology in the General College; not open to students who have taken 4, 50, 52, or 53 or who have been exempted from P.H. 3 on basis of military service.) Cowan

### ZOOLOGY

Professors Dwight E. Minnich, Ph.D., Chairman; Assistant Professor Ralph W. Dawson, Ph.D.; and assistants.

14f-15w.\* General Zoology. Structure, physiology, embryology, classification, and evolution of animals. (For students of the College of Agriculture, Forestry, Home Economics and Veterinary Medicine, School of Nursing, and College of Pharmacy.) (6 cred.; no prereq.) Dawson and assistants

\* To receive credit for any part of this course a student must complete the parts preceding the asterisk.



*Course*  
*in*  
*Applied*  
*Mortuary*  
*Science*  
1951-1953

THE *Bulletin* OF THE  
UNIVERSITY OF MINNESOTA

## BOARD OF REGENTS

The Board of Regents is composed of The Honorable Ray J. Quinlivan, St. Cloud, First Vice President and Chairman; The Honorable George W. Lawson, St. Paul, Second Vice President; The Honorable James F. Bell, Minneapolis; The Honorable Daniel C. Gainey, Owatonna; The Honorable Richard L. Griggs, Duluth; The Honorable J. S. Jones, St. Paul; The Honorable Lester A. Malkerson, Minneapolis; The Honorable Charles W. Mayo, Rochester; The Honorable E. E. Novak, New Prague; The Honorable A. J. Olson, Renville; The Honorable Herman F. Skyberg, Fisher; and The Honorable Sheldon V. Wood, Minneapolis.

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Jerome T. Syverton, M.D., Ch.E., Ph.D., Professor of Bacteriology and Head of the Department

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Volume LIV

Number 35

July 17, 1951

*Entered at the post office in Minneapolis as semi-monthly second-class matter, Minneapolis, Minnesota. Accepted for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 12, 1918.*



# Course in Applied Mortuary Science

The University of Minnesota, through the cooperation of the Medical School and other schools of the University, the Minnesota State Department of Health, and the Minnesota Funeral Directors Association, announces its Course in Applied Mortuary Science. This bulletin gives an overview of the curriculum and indicates the activities of the course. The General Extension Division is charged with the administrative responsibilities of this semi-professional program, but the course of study involves many university departments and agencies. It is an all-university course, completed in two academic years. It is co-educational and open to qualified high school graduates.

## HISTORY

The course of instruction for the mortician was established at the University of Minnesota by act of the Board of Regents on April 4, 1908. No effective organization was made, and the work lapsed until it was resumed in 1914 by the Medical School. The first session began January 5, 1914, and lasted six weeks. In 1916 the course was extended to eight weeks. Since then the length of the course has been successively extended to twelve weeks, twenty-four weeks, thirty-six weeks, and, in 1951, to encompass two academic years of instruction. The latter change brings this program into professional stature with the awarding of the degree, associate in mortuary science.

## PURPOSE

The work of the Course in Applied Mortuary Science combines instruction in the necessary basic sciences, training in the technical details of practical embalming, and instruction in business methods and procedures and in those subjects required by the State Department of Health as essential to the welfare of the community. The aim is to convey that knowledge which is requisite to conducting a business of this kind in the interest of the general public.

The two-year program is specifically planned to assist those who must qualify for licensure in states requiring college experience as a condition to practice. This curriculum will fulfill the requirements of one year of college and one year of mortuary science that is mandatory in Minnesota and other states with similar regulations. The course of study is arranged to give preparation in those academic areas that seem essential for the technical subject-matter content of the basic sciences. The six-quarter sequence is integrated to bring the greatest professional success and to contribute most to the general welfare.

## APPLICATION PROCEDURE

All inquiries, credentials, and applications for admission to the Course in Applied Mortuary Science should be addressed to the Office

of Admissions and Records, University of Minnesota, Minneapolis 14, Minnesota.

Application blanks may be obtained at any Minnesota high school or from the Office of Admissions and Records of the University of Minnesota.

An admission certificate will be mailed to each student who has met the requirements. Students entering from other colleges or universities will also receive a statement of advanced standing. Instructions for registration will either be enclosed with the admission certificate or will be mailed later—about one month before the opening of the fall quarter. Students must present their admission certificates when they report for registration.

## REGISTRATION PROCEDURE

With the admission certificate mailed to qualified applicants, you will be notified of either a special registration appointment or the specified days set aside for registration. When you report for registration you will be given a set of detailed instructions which will make the process of registration relatively simple. Your registration will be completed with the help of either the director of the course or his assistant. Special procedures are required of veterans qualifying under either Public Law 16 (Rehabilitation) or Public Law 346 (GI Bill). See the *Bulletin of General Information* for more specific details and directions.

## VOCATIONAL COUNSELING SERVICE

Because of the specialized nature of the work in funeral service all applicants are urged to consult with the assistant director of the course before registration. Advisers for the Course in Applied Mortuary Science are available for consultation in person or by letter with prospective students. Their offices are located in 155 Nicholson Hall. A pamphlet entitled *Funeral Service as a Vocation* is available upon request.

## EXAMINATION FOR MINNESOTA LICENSE AS AN EMBALMER

Candidates for a license in Minnesota as embalmer must pass satisfactorily the state examination given by the Minnesota State Board of Health. The examination is conducted annually at the close of the school year in June and is open to all applicants who have complied fully with the requirements of the licensing law (see Minnesota Statutes 1945, Section 149.01, et seq.) and the Regulations of the State Board of Health. The board is responsible for its examination and collects from each applicant the sum of \$10 as an examination and original license fee. Students in the Course in Applied Mortuary Science should distinguish carefully between the state requirements for a license and the requirements for the university certificate.

**Necessary Qualifications**—The Minnesota State Board of Health requirements for license as embalmer are set out in Regulation No. 29, as amended January 20, 1949, as follows:

## *Qualifications for License as an Embalmer*

Regulation 29. Every person who wishes to qualify as competent to embalm a body for burial or transportation, as required by the laws of the State of Minnesota, shall comply with the following requirements:

He shall make application to the Minnesota State Board of Health for a license. Such application shall contain the name of the applicant in full, age, and place of residence. It shall be accompanied by affidavits from at least two reputable residents of the county in which the applicant resides or proposes to carry on the practice of embalming or funeral directing certifying that the applicant is of good moral character.

The applicant must be at least twenty-one years of age, must have satisfactorily completed at least one scholastic year in a general educational course at an accredited college or university, and following such academic work must have completed a course of study and secured a certificate of graduation from the Course in Applied Mortuary Science conducted by the University of Minnesota or any established school of embalming accredited by the Conference of Funeral Service Examining Boards of U. S., Inc.

After the educational qualifications in the order herein specified have been acquired, the applicant shall have served at least one year of apprenticeship under an embalmer licensed in Minnesota. During this full period of practical experience or apprenticeship the applicant shall have been registered as an apprentice embalmer with the State Board of Health and shall have helped to embalm or have embalmed under supervision at least twenty-five bodies. The applicant must attain a satisfactory level of achievement in a written examination given by the State Board of Health in each of the subjects of anatomy, bacteriology, business methods, elementary chemistry, pathology, public health laws and regulations, and the practice of embalming.

An applicant who fails to attain a satisfactory level of achievement in not more than two of the required subjects shall be re-examined on application at the next annual examination in only those subjects in which he failed. An applicant who fails in three or more subjects shall be re-examined on application at the next annual examination in all subjects necessary for licensure.

## **EMBALMER'S APPRENTICESHIP**

The candidate for license, after receipt of the university certificate of graduation, shall register with the State Board of Health as an apprentice embalmer. A renewal of the registration is required in December of each year during the period necessary to satisfy the apprenticeship requirement. A fee of \$1 is required for registration and for the annual renewal. The apprentice embalmer must secure his experience under the supervision of an embalmer licensed in Minnesota. Regulation No. 47, dealing with the embalmer's apprenticeship, reads as follows:

### *Qualifications for Apprentice Embalmer*

Reg. 47. Registration with the State Board of Health as embalmer apprentice, as provided for by Chapter 417, Laws of 1937, will be accepted on condition that such registrant is so registered with the purpose of learning to be an embalmer, of complying with all necessary educational requirements, and then taking examination for the State's license.

An embalmer's apprentice may be registered and work as such for a period of not more than five years prior to obtaining a license as an embalmer; not more than three years of such apprenticeship being served prior to enrolling in an embalming school accredited by the State Board of Health, and not more than two years being served after successfully completing a course of study in such accredited embalming school.

No person who is less than 18 years of age shall be permitted to serve as an apprentice embalmer, nor shall apprenticeship registration by such persons be accepted by the Board.

No service in embalming may be performed by an apprentice except under the personal direction and in the presence of the licensed person to whom he is apprenticed or under another licensed embalmer who is a regular operator in the same establishment.

No one may at one and the same time be apprenticed to more than one licensed embalmer.

Apprenticeship registration with the Board must show the date on which such apprenticeship service began; the name and address of the licensed embalmer to whom he is apprenticed, and the name and address of the company, corporation or firm of which such licensed embalmer is the owner, partner or employee. Discontinuance of such apprenticeship service or change to some other licensed embalmer for apprenticeship service must be immediately reported to the State Board of Health. Apprentices must file with the State Board of Health not less than 25 acceptable case reports upon the forms provided by said Board for such purposes. If the embalmer to whom one is apprenticed is not the owner or manager of the establishment in which such embalmer

and his apprentice are working, then in such case all apprentice case reports and all statements concerning the period of apprenticeship, in addition to being signed by the embalmer to whom apprenticed, must also be approved and signed by the employer of such embalmer and apprentice.

## ASSOCIATE IN MORTUARY SCIENCE DEGREE

The requirements for graduation are the completion of all the required courses or their equivalent, the completion of the practical work, with a total of 96 credits and 96 honor points—an average of one honor point per credit. Upon satisfactory completion of the prescribed course of study, the degree, associate in mortuary science, will be conferred by the Board of Regents.

### PLAN OF INSTRUCTION

		Fall Quarter Credits	Winter Quarter Credits	Spring Quarter Credits	Total Credits
<b>FIRST YEAR</b>					
Inorg. Chem. 1, 2	Inorganic Chemistry .....	4	4	.....	8
Comp. 4, 5, 6	Composition .....	3	3	3	9
Mort. 13, 14	Funeral Law .....	3	3	.....	6
Mort. 8, 9, 10	Orientation .....	0	0	0	0
Phys. Ed. 1A-B-C	Physical Education .....	1	1	1	3
G.C. 41	Psychology .....	.....	.....	5	5
P.H. 3	Public Health .....	.....	.....	2	2
Zool. 1, 2, 3	Zoology .....	3	3	4	10
	Elective .....	.....	.....	3	3
		14	14	18	46
<b>SECOND YEAR</b>					
Mort. 1, 2	Anatomy .....	3	3	.....	6
Mort. 3	Business Methods .....	.....	2	.....	2
Mort. 4, 5, 6	Restorative Art .....	1	1	1	3
Mort. 7	Bacteriology .....	.....	.....	4	4
Mort. 11, 12	Chemistry .....	3	3	.....	6
Mort. 15, 16, 17	Funeral Management .....	1	1	1	3
Mort. 18, 19	Pathology .....	2	2	.....	4
Mort. 20, 21, 22	Embalming .....	3	3	3	9
Mort. 23	Psychology of Funeral Service .....	.....	.....	2	2
Mort. 24	Public Health .....	.....	.....	3	3
Mort. 25	Medical Science Survey .....	.....	.....	2	2
	Elective .....	.....	3	.....	3
Econ. 24	Accounting .....	3	.....	.....	3
		16	18	16	50

### FEES

All university fees are subject to modification without notice.

Tuition fee (per quarter)		
Residents of Minnesota .....		\$ 60.00
Nonresidents .....		100.00
Credit hour tuition fee (adult special students, auditors, and others carrying less than full work)		
Residents of Minnesota .....		5.00
Nonresidents .....		8.50
Incidental fee (per quarter) .....		15.85
Matriculation deposit (first quarter only, the balance being refunded upon graduation or termination of registration) .....		
		5.00
Graduation fee .....		10.00

Note: Certain courses because of departmental regulation or for laboratory facilities charge a small course fee. These are noted in the description of the courses.

## GRADES AND CREDIT EVALUATION

**Credits**—The amount of work a student takes or has completed is expressed in terms of *credits*. Each credit demands, on the average, three hours a week of student's time; that is, one recitation with two hours of preparation, or three hours of laboratory work.

**Grades**—Four passing grades, A (highest), B, C, and D (lowest), are given. They are all acceptable for the completion of a single course. Work completed with the grade D is counted toward graduation when combined with work of A or B grade in other courses. The grade C indicates work of the quality required for graduation in most curricula; the grades of B and A are given for work of higher degrees of excellence. The grade of I (incomplete) is a temporary grade indicating that a student has a satisfactory record in work completed but for reasons satisfactory to the instructor in charge was unable to complete the work of the course. A student receiving this grade is required to complete the work of the course within the first thirty days of his next quarter in residence or it will be marked canceled without grade.

The grade of F (failure) is given for work which in the opinion of the instructor does not deserve college credit. An F is usually given also when there is an unexplained delinquency such as absence from the final examination, though in this case it may be changed to an incomplete upon presentation of an acceptable excuse.

The grades of W, Y, and Z are also used to indicate cancellation with or without approval during the various phases of the quarter and regular withdrawals from a course without grade.

**Honor Point Ratio**—Quality of work is indicated by *honor points*. Honor points are assigned to the various grades on the assumption that in most curricula a C average is required for graduation. Each credit with the grade of C carries one honor point; each credit with the grade of B, two honor points; each credit with the grade of A, three honor points. The grades of D and F carry no honor points. A student's scholarship average is defined as the number of earned honor points divided by the total number of credits earned and failed. Scholarship averages of 1, 2, and 3 are called C, B, and A averages, respectively.

**Satisfactory Progress**—A student in this course is expected to make satisfactory progress in the curriculum he has selected. For those who are candidates for the degree, associate in mortuary science, this is interpreted to mean a C average and the completion of each required course. The cases of students who are not reaching this standard are considered by the Students' Work Committee.

During the quarter, instructors report to the committee the names of students who are likely to fail. These students are referred to a special counselor to discuss their situation and to see what may be done to help them. It is always best for a student to see his class instructor or his faculty counselor as soon as he feels himself in difficulty rather than to wait until he has already received a poor grade.

**Probation**—When the grades at the end of a quarter indicate that a student is in serious scholastic difficulty, he is placed on probation. While

on this status he is afforded special aid in discovering the reasons for his difficulty and in finding ways of overcoming it. He is usually given at least one quarter to show improvement. In any case the probation period will not be extended beyond *two* quarters unless the Students' Work Committee is convinced that the causes of the student's poor work are beyond his control and will soon disappear.

If a student is placed on "strict probation," he may expect to be dropped at the end of the current quarter unless he fully achieves a specified quality of work.

The probationary status indicates serious doubt whether the student will succeed in college. While poor grades are a primary factor in determining this status, a record of continuous cancellations and incompletes likewise indicates scholastic weakness.

A student will always be placed on probation if the following conditions arise:

1. Failing grades in over half of his work for any quarter.
2. An honor point ratio under .50 at the end of two quarters.
3. An honor point ratio under .60 at the end of three quarters.
4. An honor point ratio under .75 at the end of four quarters.
5. An honor point ratio under .85 at the end of five quarters.
6. An honor point ratio under 1.0 at the end of six quarters.

When the student's work improves to a point where he is again making normal progress toward a degree, he will be notified of his removal from probationary status.

**Exclusion from College**—Students excluded from college shall be recorded with the Office of Admissions and Records as (1) transferred, (2) discontinued, (3) dropped.

1. Transferred—If a student's attitude toward his work is satisfactory but he evidently is not following the curriculum appropriate for him, he may be transferred to another college at the end of any quarter with the approval of the two colleges concerned.
2. Discontinued—If a student is pursuing this as an appropriate course but is handicapped by conditions he cannot control (ill health, necessary outside work, etc.) he may be required to discontinue his registration until these conditions have improved. When discontinuance takes place at any time other than the end of the quarter, the courses for which he is registered are recorded as canceled without grade, a grade of W.
3. Dropped—A student who has failed to meet the terms of his probation shall be dropped.

**Readmission to the Course**—Students excluded from the course are allowed to return only with the permission of the Students' Work Committee. Students classified as discontinued must present evidence that the conditions which hindered their work have been remedied. A student who has been dropped may petition for readmission after an interval of one year. The petition must present specific evidence that he is now likely to succeed with the work of the course. Students who return under the provision of the preceding statements will be registered on strict probation. They may be dropped at any time that their work is unsatisfactory.

**Class Attendance**—Every student in this course has a responsibility for class attendance. Only absences with good reason (such as illness for which a Health Service excuse is obtained) are legitimate. The faculty delegates the handling of absences to the various departments, to be dealt with under the assumption that every student is expected to do the full work of the class. Since the departments have different ways of treating absences, the student must familiarize himself with the method of each department in which he is taking work. To obtain an official excuse he should go to the office of the assistant director, 155 Nicholson Hall.

**Final Examinations**—The all-university final examination schedule is published each quarter in the Official Daily Bulletin well in advance of the examination period. Students are required to take examinations at the scheduled time. However, if the student has a conflict in examinations or if he has three examinations in one day, he should report that fact to the Students' Work Committee in 155 Nicholson Hall for possible adjustment.

If a student misses a final examination without excuse, an F grade is normally recorded. If he can show good reason for the absence, he may petition the Students' Work Committee for substitution of a grade of Incomplete (I) that can be made up.

## STUDENTS' WORK COMMITTEE

This is a committee of the faculty charged with the interpretation and enforcement of faculty regulations. It is empowered also to make exceptions to faculty regulations when those regulations work to the educational disadvantage of a particular student, provided the basic spirit of the regulation is maintained.

Often a student is in doubt about his obligations or some rule seems to stand in the way of his objective. The Students' Work Committee is designed to help with such problems. It has special counselors available for consultation, and often an adjustment can be worked out. The committee and its representatives are eager to help the student whenever possible.

To initiate committee action, a student should go to the office of the assistant director and discuss his case with him. To be exempted from a regulation, you must prepare a written petition which can be obtained at the time of your consultation with the assistant director. The process of committee action takes time and you should allow a few days for the committee's decision. Your copy will be returned to your post-office box with the action indicated.

The committee is made up of the director and assistant director plus one other faculty member appointed annually by the dean of University Extension. The assistant director serves as student counselor and secretary for the committee.

## AWARDS

**Award of Merit**—Each year the Minnesota Funeral Directors' Association will award at the commencement exercises a certificate of merit to the outstanding student in the Course in Applied Mortuary Science. The student will be selected by a committee from the association, the Minnesota State Department of Health Committee of Examiners, and

the faculty. The award is made on the basis of scholarship, citizenship, professional attitude, and personality.

**DIF Award**—*Diligentissime Incubuit Fortiterque* (he has applied himself with the greatest diligence and vigorously). This award was established by Mr. Hansen and Mr. Slater in 1951 and will be given annually to a member of the graduating class in mortuary science. The student selected for this award will be the one who best exemplifies the qualities of perseverance, diligence, and cooperation, and who manifests the greatest rate of academic improvement, regardless of final honor-point ratio. The award is a gold key appropriately inscribed and will be presented either at the commencement exercises or at Class Day festivities.

### LOAN FUNDS

The University of Minnesota has numerous loan funds. They are restricted in their distribution to individuals meeting certain requirements. A loan usually cannot be obtained before two quarters of attendance at the University, during which time the student will have the opportunity to demonstrate his ability and integrity. The only security for the loans made to students is the character of the applicant and his ability to do college work. Application for loans may be made to the Bureau of Student Loans and Scholarships, 207 Eddy Hall, a department under the Office of the Dean of Students.

### SELF-SUPPORT

The University Employment Bureau, Room 17, Administration Building, efficiently assists students who find it necessary to earn part or all of their expenses. However, the regular course in mortuary science is a full program and students find it difficult to devote many hours a week to outside employment. Several of the Twin Cities funeral homes have part-time vacancies for students in mortuary science. If a student is interested in this type of employment he should contact the assistant director in 155 Nicholson Hall.

### STUDENTS' HEALTH SERVICE

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

### LIBRARY

The University of Minnesota Library is one of the finest libraries in existence today. It includes about 1,000,000 volumes and many periodicals and pamphlets, and in scope takes in every subject in the university cur-



riculum. Its large, airy reading rooms provide an excellent place to study.

The Biological-Medical Room occupies the north end of the second floor of the library and will accommodate 216 readers. Reference books, texts, and other treatises of interest to students in this course are kept on open shelves in this room and are available to the students at any time during regular university library hours. Also, in the office of the assistant director, current pamphlets, texts, and other periodicals are available to the students for loan. The supply includes bound volumes of the four leading trade journals for the period of the last decade.

### COFFMAN MEMORIAL UNION

The Coffman Memorial Union places Minnesota in the forefront of American universities as to the recreational facilities which it offers to students. The student post office, cafeterias and lunchrooms, committee dining rooms, lounges for men and women, game rooms, bowling alleys, pool and billiard rooms, offices for student organizations, barber shop, beauty parlor, library, art room, and spacious ballrooms are among the features that make the building the popular center of campus life.

### RESIDENCES

University owned and operated dormitories are available to students in this course. Preferential treatment is given all applicants who are Minnesota residents. In addition to these facilities maintained by the University, there are numerous private rooming houses for men and women students. All of these are inspected and must meet minimum standards of operation set by the University. For further information students may contact the Director of the Student Housing Bureau, Room 202, Eddy Hall. Dormitory facilities are described in detail in the *General Information Bulletin*.

## DESCRIPTION OF REQUIRED COURSES

A "dagger" (†) indicates that all quarters of the course must be completed before credit is received for any quarter.

### MORTUARY SCIENCE

- 1f-2w.†† Anatomy for Embalmers. Lecturers, recitations, and laboratory work. This includes both microscopic anatomy and gross dissection, and covers the principal systems of the body. Each student will obtain experience in personally raising different arteries, and will familiarize himself with the anatomy relating to practical embalming. Two hours of lecture and four hours of laboratory per week for two quarters. (6 cred.; soph.; prereq. Zool. 1-2-3) Boyden and staff
3. Business Methods. Suitable records and statements for a funeral establishment. A set of transactions for a funeral business has been devised, which the student carries through typical records and statements. Methods of obtaining cost data for a variety of priced cases are demonstrated and income tax forms are examined and explained. Two hours a week for one quarter. (2 cred.; soph.; prereq. Econ. 24) Lund
- 4f-5w-6s.††† Restorative Art. Lectures, demonstrations, and practical work. The following subjects of study are included: Sculpture—anatomical modeling, with emphasis on muscles of expression, familiarization with tools, materials, and techniques of rebuilding human face and body; Color—practical color schemes for general applications, as in cosmetics and interior decoration, physical effect of colors upon forms, psychological effects of colors upon people; Design—developing good taste, sensitivity of proportion, colors, and their relationship with environment. Two hours of laboratory per week for three quarters. (3 cred.; soph.) Safer
- 7.††† Bacteriology. Lectures, laboratory procedures and demonstrations. Subjects of study included: distribution of bacteria, nutrition of bacteria, bacterial physiology, disinfection and sterilization, transmission of infection, post-mortem bacteriology, immunity, pathogenic bacteria, viruses, pathogenic fungi and protozoa. Three hours of lecture and four hours of laboratory per week for one quarter. (4 cred.; soph.; prereq. Zool. 1-2-3) Syverton and staff
- 8f-9w-10s.† Orientation in Funeral Service. A series of lectures designed to acquaint the student with a better understanding of funeral service. Aptitudes, skills, and personal qualifications will be discussed. Field trips to local mortuaries and funeral homes will be arranged. One hour per week for three quarters. (No cred.; no prereq.) Slater
- 11f-12w.\*† Chemistry for Embalmers. Lectures, demonstrations, and individual laboratory work covering fundamental ideas of inorganic and organic chemistry. The chemistry of the body and of disinfection and sanitation and certain general chemical actions involved in the work of morticians will be presented. Subjects of study include: physiological chemistry, toxicology, chemical changes in cadavers, disinfection and embalming fluids. Two hours of lecture and three hours of laboratory per week for two quarters. (3 cred. per qtr.; soph.; prereq. Inorg.Chem. 1-2) Pervier
- 13f-14w.† Funeral Law. Lectures on basic funeral law, mortuary jurisprudence, probate of estates, special and general administratorships, social security, life insurance forms, public and personal liability, and other subjects of law pertinent to conducting a funeral service establishment. Three hours a week for two quarters. (3 cred. per qtr.; no prereq.) Carney
- 15f-16w-17s.† Funeral Management. These lectures are intended to acquaint the student with the best current practice in funeral management. They offer an opportunity to meet local directors of long experience and high standing, and to acquire practical dependable information about the

\* See †† footnote, page 14.

† A fee of \$1 per quarter is charged for this course.

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

††† A fee of \$3 per quarter is charged for this course.

- important aspects of operating a funeral establishment—an opportunity the value of which students will readily appreciate. The class is also given an opportunity to make field trips to local mortuaries, cemeteries, casket and vault manufacturing plants. An attempt will be made to conduct actual clinics in local funeral homes to demonstrate the proper conducting of funeral services, at which time the student will actually participate in several phases of funeral directing. Two hours of lecture per week for three quarters and field trips. (3 cred.; soph.; prereq. Mort. 10) Slater
- 18f-19w.† Pathology. Lectures on gross pathology, with demonstrations. A detailed study of the causes of disease and etiological factors. Attendance at autopsies when arrangements can be made. Two hours of lecture and one hour of laboratory per week for two quarters. (4 cred.; soph.; prereq. Zool. 1-2-3) Dawson and staff
- 20f-21w-22s.†† Embalming Theory and Practice. Lectures, demonstrations, and other visual presentations, laboratory practice, and clinical work. Class participation in actual embalming will be emphasized. Throughout the year all students will be subject to call to attend clinical calls made available through the courtesy of Twin Cities funeral directors, and the local morgues or other agencies. These clinics are under the direction of licensed embalmers on the full-time staff. Every possible opportunity will be given students to assist in the preparations; and attendance at and participation in a prescribed number of such clinical calls is a necessary qualification for the successful completion of the requirements for a degree. Three hours of lecture per week, arranged quiz sections, and clinical calls per quarter for three quarters. (9 cred.; prereq. Mort. 10, Zool. 1-2-3) Slater
23. Psychology of Funeral Service. This course will present those principles of psychology most helpful to a prospective funeral director in dealing tactfully with the people with whom he comes in contact, especially those under severe emotional stress. Two hours a week for one quarter. (2 cred.; soph.; prereq. G.C. 41) White
24. Public Health, Minnesota Laws and Regulations. The Minnesota State Department of Health staff gives a series of public health lectures arranged by the executive officer, A. J. Chesley, M.D. These lectures are designed to acquaint the student with the basic principles and practices of public health administration and to survey the organization and functions of the various agencies at the federal, state, and local levels of government which are engaged in carrying on activities and programs in the preservation and protection of public health. The role of the mortician with reference to these activities is considered, and the regulatory procedures as applied to the removal, preparation and disposal of dead human bodies are examined, illustrated and explained. The course offers the future embalmer and funeral director valuable orientation in his responsibilities for the health of the community in which he will practice and in his relationships with the local boards of health and with the State Department of Health. Three hours of lecture per week for one quarter. (3 cred.; soph.) Brower
25. Medical Science Survey. A comprehensive survey of anatomy, bacteriology, and pathology and their relation to the embalmer as a technician. Two hours a week for one quarter. (2 cred.; soph.; prereq. Mort. 2, 7, and 19) Ar.

#### COMPOSITION

- 4f-5w-6s. Freshman Composition. The study of the fundamental principles of composition and training in the art of writing. Three hours a week for three quarters. (9 cred.; prereq. assignment to category (1), (2), or (3) on English Classification Card, Part II) Ar.

Note: With permission of the Students' Work Committee this requirement may be met by substituting G.C. 31A, B, and D in the General College.

† A fee of \$3 per quarter is charged for this course.

## ECONOMICS

24. Principles of Accounting. The balance sheet, profit and loss statement, the recording process, special journals and ledgers, adjustments, work sheets, and closing entries. Three hours a week for one quarter. (3 cred.; soph.) Ar.

## INORGANIC CHEMISTRY

- 1f†-2w.†† General Inorganic Chemistry. Study of the general laws of chemistry and of the nonmetals and their compounds. Three hours of lecture, one quiz hour, and four hours of laboratory per week for two quarters. (4 cred. per qtr.; no prereq.) Ar.

## PHYSICAL EDUCATION

- 1Af-Bw-Cs.† Sports Education. This is an orientation course in a variety of recreational sports in which the student has had little or no experience. The objective is to provide instruction and competition in those sports in which men may participate now and in future years as a means of obtaining recreation, regular exercise, and social intercourse. Three hours per week for three quarters. (1 cred. per qtr.; no prereq.) Ar.

Note: A towel and locker fee of \$2.50 per quarter is charged all students using physical education facilities for activity. Uniforms for class work or recreational activity are \$2 per quarter.

Note to women students: Arrangements for meeting this requirement for women students are made in cooperation with the Department of Physical Education for Women.

## PSYCHOLOGY

- G.C. 41s. Practical Applications of Psychology. Psychology is concerned with human activity. Because every person is influenced by the behavior of other people, this behavior is studied for its practical significance. The aim of this course, then, is to present a picture of the ways in which the human being meets the problems of his environment and develops the many traits which are called personality. It seeks to answer the question, "Why do we behave as we do?" Five hours per week for one quarter. (5 cred.; no prereq.) Longstaff, MacCorquodale

## PUBLIC HEALTH

- 3s. Personal Health. Elementary principles of normal body function; predisposing and actual causes of disease; ways in which disease may be avoided. Two hours a week for one quarter. (2 cred.; fr., soph.; no prereq.; not open to students who have taken Hum.Biol. G.C. 10C) Thomson

## ZOOLOGY

- 1f-2w-3s.††† General Zoology. This course is designed to acquaint the student with the fundamental principles of general zoology. It deals especially with the structure, physiology, embryology, classification, reproduction, and evolution of animals. Textbook, lectures, quizzes, and laboratory. Students should arrange their programs so as to remain in the same lecture and laboratory sections throughout the entire year. Two lecture hours and four laboratory hours per week for three quarters. (10 cred.; no prereq.) Minnich and staff

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

†† A fee of \$3 per quarter is charged for this course. Nonveterans should purchase a \$10 chemistry deposit card from the bursar in the Administration Building. No student will be assigned a desk in the laboratory until he presents this card. The \$3 course fee, laboratory material, and breakage will be charged against the deposit. Veterans will receive information from the instructor concerning the purchase of the card and checking into the laboratory.

††† A fee of \$2 per quarter is charged for this course.

## ELECTIVES

Each student is required to take a 3-credit elective course during the first and second years of the curriculum. These courses should be selected in keeping with the student's aptitudes and interests. Each student should try to choose his electives from a single area of concentration. *All elective courses* whether selected during the freshman or sophomore year must have the approval of the student's adviser. The following subjects are recommended electives. For a full course description the student should consult the appropriate college bulletin.

### *In the College of Science, Literature, and the Arts*

#### **Economics**

- 3. Elements of Money and Banking, 5 cred.
- 5. Elements of Statistics, 5 cred.
- 32. Beginning Typewriting, 1 cred.

#### **Family Life**

- 1. Preparation for Marriage, 3 cred.
- 15. The Home and Its Furnishings, 3 cred.

#### **Humanities**

- 1. Humanities in the Modern World I, 5 cred.
- 23. American Life III, 3 cred.

Art 1. Principles of Art, 4 cred.

Music 10. Introduction to Music, 4 cred.

Per.Or. 1. How to Study, 2 cred.

#### **History**

- 3. Civilization of the Modern World, 3 cred.

#### **Military Science and Tactics (ROTC)**

- 1-2-3. First Year Basic Course, 3 qtr., 1 cred. per qtr.

#### **Philosophy**

- 1. Problems of Philosophy, 5 cred.
- 2. Logic, 5 cred.
- 3. Ethics, 5 cred.

#### **Physiology**

- 4. Human Physiology, 4 cred.

#### **Political Science**

- 25. World Politics, 3 cred.

#### **Public Health**

- 4. Health Problems of the Community, 2 cred.

#### **Sociology**

- 1. Introduction to Sociology, 3 cred.

#### **Speech**

- 1. Fundamentals of Speech, 3 cred.

Note: Must be followed by Speech 2 (3 cred.) to receive credit.

### *In the General College*

G.C. 1A. Individual Orientation, 4 cred.

G.C. 3. Home Life Orientation, 5 cred.

G.C. 4. Problems of Contemporary Society, 5 cred.

G.C. 7EX. Sound in Music and Speech, 3 cred.

G.C. 8. Applied Mathematics, 5 cred.

G.C. 22X. Art in Business, 3 cred.

G.C. 26A. Photography, 3 cred.

G.C. 30A,B,C,D,E. Literature Today, 3 cred. each section

G.C. 31D. Business Writing, 3 cred.

G.C. 32A. Basic Principles of Oral Communication, 3 cred.

G.C. 37. Social Trends and Problems, 5 cred.

G.C. 40A. Introduction to Philosophy, 3 cred.

G.C. 40CX. Religions in Minnesota, 3 cred.

G.C. 43A. Background of the Modern World, 5 cred.

G.C. 43B. Historical Biography, 3 cred.

G.C. 44B. Current History, 2 cred.

G.C. 45A. The Growth of American Democracy, 5 cred.

G.C. 45B. American Economic and Social Development, 3 cred.

G.C. 45C. Minnesota and the Upper Midwest, 5 cred.

G.C. 45D. Community Problems, 3 cred.

G.C. 46B. The Functions and Problems of Government, 3 cred.

G.C. 47A. Fundamentals of Typewriting, 1 cred.



1. Folwell Hall
2. Jones Hall
3. Pillsbury Hall
4. Northrop Auditorium
5. Administration
6. Physics
7. Vincent Hall
8. Murphy Hall

9. Ford Hall
10. Zoology
11. Botany
12. Coffman Union
13. Chemistry
14. Library
15. Johnston Hall
16. Westbrook Hall

17. Nicholson Hall
18. Eddy Hall
19. Burton Hall
20. Shevlin Hall
21. Pattee Hall
22. Norris Gymnasium
23. Psychology
24. Scott Hall