

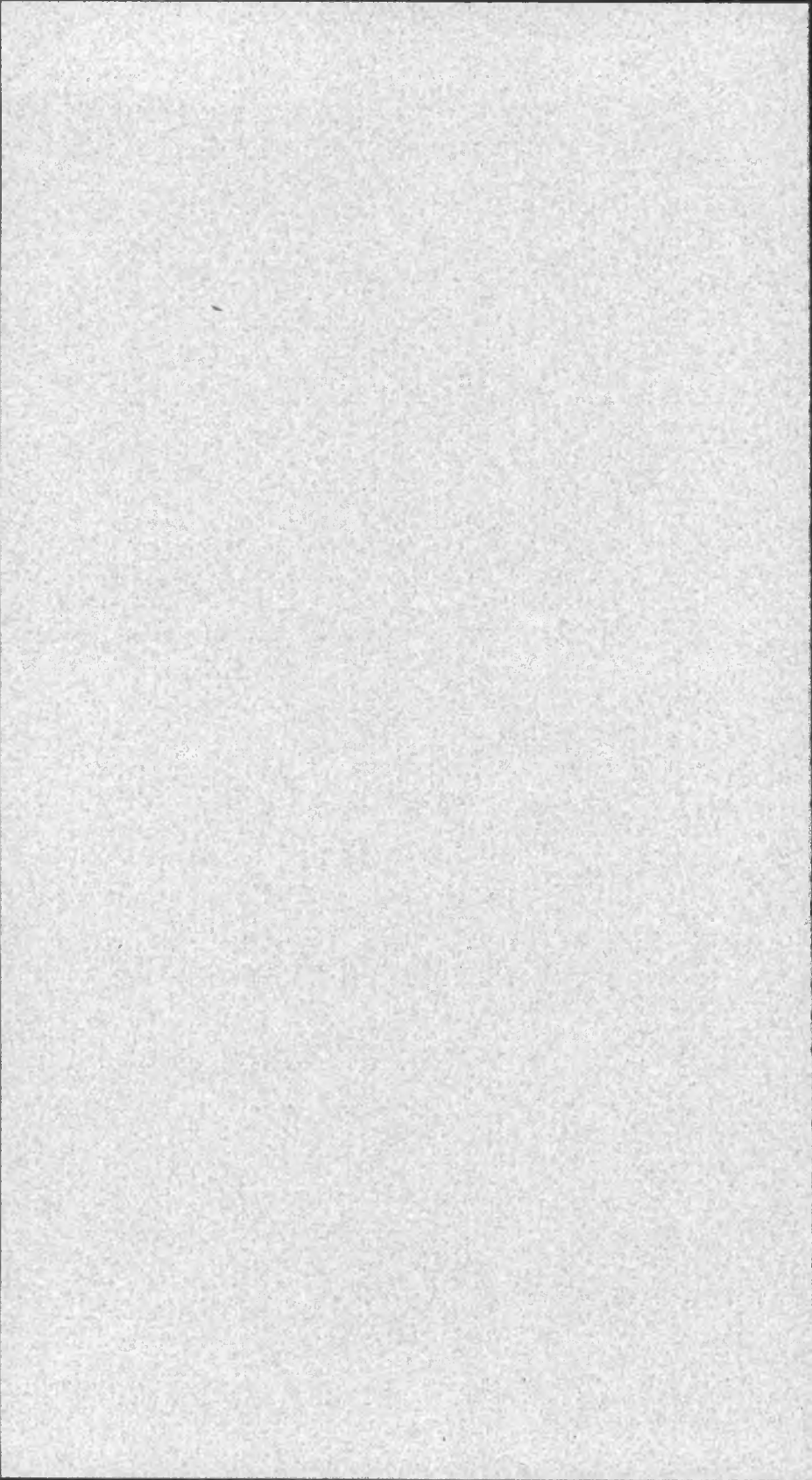


Cornell
University

ANNOUNCEMENTS

Graduate School of
Nutrition

1969-70



Cornell University

Graduate School of
Nutrition

1969-70

The Graduate School of Nutrition, a unit of Cornell University, is supported in part by state appropriations through the State University of New York

Cornell Academic Calendar

1969-70*

Registration, new students	Th, Sept. 11
Registration, old students	F, Sept. 12
Fall term instruction begins, 7:30 A.M.	M, Sept. 15
Midterm grade reports due	S, Oct. 25
Thanksgiving recess:	
Instruction suspended, 1:10 P.M.	W, Nov. 26
Instruction resumed, 7:30 A.M.	M, Dec. 1
Fall term instruction ends, 1:10 P.M.	S, Dec. 20
Christmas recess	
Independent study period begins	M, Jan. 5
Final examinations begin	M, Jan. 12
Final examinations end	T, Jan. 20
Intersession begins	W, Jan. 21
Registration, new students	Th, Jan. 29
Registration, old students	F, Jan. 30
Spring term instruction begins, 7:30 A.M.	M, Feb. 2
Deadline: changed or make-up grades	M, Feb. 9
Midterm grade reports due	S, Mar. 14
Spring recess:	
Instruction suspended, 1:10 P.M.	S, Mar. 28
Instruction resumed, 7:30 A.M.	M, Apr. 6
Spring term instruction ends, 1:10 P.M.	S, May 16
Independent study period begins	M, May 18
Final examinations begin	M, May 25
Final examinations end	T, June 2
Commencement Day	M, June 8
Deadline: changed or make-up grades	M, June 15

* The dates shown in the Academic Calendar are subject to change at any time by official action of Cornell University.

CORNELL UNIVERSITY ANNOUNCEMENTS

Volume 60. Number 15. January 29, 1969. Published twenty-two times a year: four times in August; three times in March and October; twice in May, July, September, and November; once in January, April, June, and December. Published by Cornell University at Sheldon Court, 420 College Avenue, Ithaca, New York 14850. Second-class postage paid at Ithaca, New York.

Contents

2	ACADEMIC CALENDAR
5	ADMINISTRATION AND FACULTY
9	THE GRADUATE SCHOOL OF NUTRITION
9	NUTRITION PROGRAMS AT CORNELL
10	THE FACULTY
10	CURRICULUM AND DEGREES
13	ADMISSION REQUIREMENTS
17	REQUIREMENTS FOR GRADUATION
22	TUITION AND FEES
23	ASSISTANTSHIPS AND TRAINEESHIPS
24	ADVISORY SERVICE FOR CORNELL UNDERGRADUATES
24	HEALTH SERVICES AND MEDICAL CARE
25	GRADUATE HOUSING
27	DESCRIPTION OF COURSES
27	Nutrition
35	Public Health
36	Biochemistry
38	Chemistry and Physics
39	Economics
40	Food Science
44	Mathematics
45	Microbiology
48	Pathology
48	Physical Biology
48	Physiology
50	Social Studies
53	Research
53	Seminars
57	INDEX OF COURSES
61	GENERAL INDEX
63	CORNELL UNIVERSITY ANNOUNCEMENTS

The courses and curricula described in this *Announcement*, and the teaching personnel listed therein, are subject to change at any time by official action of Cornell University.



GRADUATE SCHOOL OF NUTRITION

UNIVERSITY ADMINISTRATION

James A. Perkins, President of the University
Dale R. Corson, University Provost
Mark Barlow, Jr., Vice President for Student Affairs
Stuart M. Brown, Jr., Vice President for Academic Affairs
John E. Burton, Vice President-Business
Lewis H. Durland, University Treasurer
W. Keith Kennedy, Vice Provost
Franklin A. Long, Vice President for Research and Advanced Studies
E. Hugh Luckey, Vice President for Medical Affairs
Thomas W. Mackesey, Vice President for Planning
Paul L. McKeegan, Director of the Budget
Robert D. Miller, Dean of the University Faculty
Steven Muller, Vice President for Public Affairs
Arthur H. Peterson, University Controller
Neal R. Stamp, Secretary of the Corporation and University Counsel

ADMINISTRATION OF THE GRADUATE SCHOOL OF NUTRITION

James A. Perkins, President of the University
Dale R. Corson, University Provost
Stuart M. Brown, Jr., Vice President for Academic Affairs
Richard H. Barnes, Dean of the School
Charlotte M. Young, Secretary of the School

FACULTY

More than fifty professors are on the faculty of the Graduate School of Nutrition. Most hold joint appointments in the School and have their main affiliation in other colleges at the University. The core faculty includes those professors whose primary appointments are in the Graduate School of Nutrition.

Joint Faculty

The titles and the departments (or sections) of primary affiliation of faculty members are indicated.

Armbruster, Gertrude D., Ph.D., Associate Professor, Food and Nutrition
Baker, Robert C., Ph.D., Professor, Poultry Science
Bensadoun, André, Ph.D., Associate Professor, Poultry Science
Buck, Paul A., Ph.D., Associate Professor, Food Science

Uris Library, with its clock tower, and Olin Research Library (left) are two of the several large libraries on the Cornell campus.

6 FACULTY

- Comar, Cyril L., Ph.D., Professor, Physical Biology
Daniel, Louise J., Ph.D., Professor, Biochemistry
Darling, C. Douglas, M.D., Professor, University Health Services
Donald, Elizabeth A., Ph.D., Associate Professor, Food and Nutrition
Finn, Robert K., Ph.D., Professor, Chemical Engineering
Hackler, L. Ross, Ph.D., Associate Professor, Food Science and Technology, Geneva
Hartman, John D., Ph.D., Professor, Vegetable Crops
Hester, E. Elizabeth, Ph.D., Professor, Food and Nutrition
Hogue, Douglas E., Ph.D., Associate Professor, Animal Science
Isenberg, F.M.R., Ph.D., Professor, Vegetable Crops
Krook, Lennart, D.V.M., Ph.D., Professor, Pathology
Lengemann, Frederick W., Ph.D., Professor, Physical Biology
Loosli, John K., Ph.D., Professor, Animal Science
Mattick, Leonard R., Ph.D., Associate Professor, Food Science and Technology, Geneva
Merrill, William G., Ph.D., Associate Professor, Animal Science
Mondy, Nell, Ph.D., Associate Professor, Food and Nutrition
Morrison, Mary A., Ph.D., Professor, Food and Nutrition
Moyer, James C., Ph.D., Professor, Food Science and Technology, Geneva
Nelson, Walter L., Ph.D., Professor, Biochemistry
Nesheim, Malden C., Ph.D., Associate Professor, Poultry Science
Newman, Katherine J., Ph.D., Associate Professor, Food and Nutrition
Pond, Wilson G., Ph.D., Associate Professor, Animal Science
Reid, John Thomas, Ph.D., Professor, Animal Science
Rivers, Jerry Margaret, Ph.D., Associate Professor, Food and Nutrition
Robinson, Willard B., Ph.D., Professor, Food Science and Technology, Geneva
Scott, Milton L., Ph.D., Professor, Poultry Science
Seeley, Harry W., Jr., Ph.D., Professor, Microbiology
Shallenberger, Robert S., Ph.D., Professor, Food Science and Technology, Geneva
Smith, Sedgwick E., Ph.D., Professor, Animal Science
Smock, Robert M., Ph.D., Professor, Pomology
Snook, Jean T., Ph.D., Assistant Professor, Food and Nutrition
Steinkraus, Keith H., Ph.D., Professor, Food Science and Technology, Geneva
Turk, Kenneth L., Ph.D., Professor, Animal Science
VanBuren, Jerome P., Ph.D., Associate Professor, Food Science and Technology, Geneva
Vissek, Willard J., Ph.D., M.D., Professor, Animal Science
Warner, Richard G., Ph.D., Professor, Animal Science
Wasserman, Robert H., Ph.D., Professor, Physical Biology
Wellington, George H., Ph.D., Professor, Animal Science
Williams, Harold H., Ph.D., Professor, Biochemistry
Winick, Myron J., M.D., Associate Professor, Pediatrics, Cornell Medical College, New York City
Young, Robert J., Ph.D., Professor, Poultry Science

Core Faculty, Graduate School of Nutrition

Barnes, Richard H., Ph.D., Professor

Call, David L., Ph.D., Associate Professor, H. E. Babcock

Professorship of Food Economics

Gaylor, James L., Ph.D., Associate Professor

Latham, Michael C., M.D., Professor

Lutwak, Leo, Ph.D., M.D., James Jamison Professor of Clinical
Nutrition

Maynard, Leonard A., Ph.D., Professor Emeritus

McCormick, Donald B., Ph.D., Associate Professor

Ogawa, Shozo, Ph.D., M.D., Assistant Clinical Professor

Roe, Daphne A., M.D., Assistant Clinical Professor

Wright, Lemuel D., Ph.D., Professor

Young, Charlotte M., Ph.D., Professor

Zilversmit, Donald B., Ph.D., Professor



Cornell University

GRADUATE SCHOOL OF NUTRITION

The Graduate School of Nutrition was founded in 1941 to provide graduate training and research opportunities in nutrition at Cornell. Although graduate programs in nutrition are available in other departments of the University, the Graduate School of Nutrition offers its own unique curriculum designed as a final preparation for students who, after graduation, wish to work in the field of nutritional or food science. The broad academic curriculum also provides an excellent background for students who wish to continue in a graduate program leading to a doctoral degree in nutrition or a related science. Special instruction is available to students whose previous academic training has not necessarily been in the field of nutrition.

In the past, nutrition was the study of the relationships between the biological sciences and the intact organism, in the healthy or diseased state. The concept of nutrition today also embraces many other disciplines including the behavioral sciences, food technology, economics, and education. Appreciating the fact that the science of nutrition cannot exist separately from fundamental biochemistry, the research and training programs of the Graduate School of Nutrition have for some time been aligned, with heavy emphasis on biochemistry in areas ranging from the study of enzymological phenomena at the subcellular level to the direct application of biochemical principles in animals and man.

In recent years, the interdependence of the nutritional and social sciences has been more fully recognized; therefore, the research programs at the School now include such studies as the effect of early nutrition on behavioral development and investigations of the complex social, cultural, and economic factors which influence nutritional practices and contribute to the vast problem of malnutrition during early life.

NUTRITION PROGRAMS AT CORNELL

The existence of three separate graduate programs in nutrition accounts for the continued strength and diversity of nutritional science at the

University. First, the Graduate Field of Nutrition offers one graduate program which includes all Cornell faculty members who are qualified to direct graduate students toward the M.S. or Ph.D. degree in the many biological subdivisions of nutrition. Second, the Graduate Field of Food and Nutrition offers another program which also leads to the M.S. or Ph.D. degree but which is staffed mainly by faculty members from the New York State College of Home Economics. Finally, the Graduate School of Nutrition offers the professional degree programs described in this *Announcement*, and it grants the degrees of Master of Nutritional Science (M.N.S.) and Master of Food Science (M.F.S.). The professional degree program differs from the M.S. degree programs primarily in that the professional degrees are planned as terminal degrees, and therefore more attention is given to breadth of background in a variety of academic subjects than is usually the case in the curriculum leading to the M.S. degree. However, many students who have obtained the excellent training of the M.N.S. or M.F.S. degree decide to continue to a Ph.D. degree. In addition to a core faculty of the Graduate School of Nutrition, the faculty of a number of departments and divisions of the University are drawn upon to provide counseling and instruction in the School's programs.

THE FACULTY

A faculty of more than fifty professors serves the Graduate School of Nutrition to make possible the School's extensive program. Most of the faculty members hold joint appointments in the Graduate School of Nutrition but have their primary affiliation in other colleges at Cornell. The core faculty includes those professors whose primary appointments are in the School. Among the core faculty members are biochemists working in research areas from subcellular enzymology to the more direct application of biochemistry to the nutritional status of the intact organism; clinicians conducting continuous metabolic studies of a variety of clinical conditions; experimental nutritionists and experimental psychologists using animals to replicate some of the more serious problems of malnutrition in man; public health nutritionists training students for careers in community nutrition; and experts in international nutrition conducting research and training students in those areas of nutrition that are, to some extent, characteristic of the developing countries of the world.

The complete faculty of the School also includes animal nutritionists, food economists, food scientists, and specialists in other areas related to agriculture and home economics.

Core faculty offices and laboratories are located in Savage Hall or in its Clinical Nutrition Unit in Cornell's Sage Infirmary.

CURRICULUM AND DEGREES

The Graduate School of Nutrition offers two professional degrees, Master of Nutritional Science (M.N.S.) and Master of Food Science

(M.F.S.). Considering the many disciplines associated with nutrition, these Master's degree programs are designed to be academically strong and professionally useful. The caliber of positions held by graduates reflects the quality of training received. The student obtains a firm foundation in the sciences basic to his chosen area of specialization, as well as practical preparation, through carefully selected courses and a special research problem, for work in his professional career. Each student is assigned a faculty adviser in whose area of specialization his own interests lie. An adviser may be selected from among those on the entire faculty, however, members of the core faculty serve as advisers more frequently. The adviser plans the curriculum and directs the student's special research problem, which includes a prepared report of thesis quality.

Students completing the M.N.S. or M.F.S. degree also have excellent training for more advanced study. Many continue to a Ph.D. degree in such Fields as Biochemistry, Physiology, Food Science and Technology, and Nutrition (animal or human). Numerous students have found the Master's degree programs particularly helpful in the selection of an area of graduate study leading to the Ph.D. degree.

Master of Nutritional Science

One of the strengths of the School, not found in many other institutions, is that training for the M.N.S. degree is provided in a number of specializations. Among these are:

Nutritional Biochemistry	Human Nutrition
Experimental Animal Nutrition	Public Health Nutrition
Agricultural Animal Nutrition	International Nutrition
Clinical Nutrition	

The basic training for the degree emphasizes the physical and biological sciences and the basic principles of nutrition. Through an appropriate curriculum planned by his adviser, the student learns to apply these basic principles in the particular specialization in which he wishes to become proficient. Experience in a laboratory or in field work usually becomes the basis of the special research problem report. Facilities for research include biochemical, microbiological and physiological laboratories, experimental animal quarters, a diet table for experimental work in human studies, and a metabolic unit in Cornell's Sage Infirmary for the study of nutrition in relation to disease.

Since two of the specializations, public health nutrition and international nutrition, involve special arrangements for field experience rather than laboratory training, they will be described in more detail.

PUBLIC HEALTH NUTRITION

Special opportunities are provided for students of appropriate background who want to work as community nutritionists with health and welfare agencies. In this specialization, the curriculum includes certain

phases of the social sciences, education, clinical and public health nutrition, and appropriate information service techniques. Students accepted for training in this area gain further insight into public health nutrition by spending a two-month summer period in "in-service" nutritional training as applied to the community and to public health under the supervision of a qualified public health nutritionist. Assistance will be given in making the necessary contacts to obtain a training program directed by a qualified supervisor. Students must be prepared to defray living costs. These field assignments may form the basis for the required report on an individual's research problem.

INTERNATIONAL NUTRITION

The School offers the program in international nutrition to meet the need for professionally trained men and women to work for government and international agencies in those developing countries where malnutrition and undernutrition exist. The program includes courses in the sciences basic to nutrition that are extensive enough to equip students for a variety of careers in nutrition. Emphasis in electives is then placed on specialized study in problems and programs in international nutrition and related fields such as agriculture, public health, extension teaching, sociology, anthropology, demography, economics and nutrition education. It is usually possible for students to obtain supervised field experience in a nutrition program in a developing country for two or three months. Several traineeships and assistantships are available to qualified students. For further details, request the leaflet *Program in International Nutrition* from the Graduate School of Nutrition.

Master of Food Science

Growing emphasis on food production—its availability, quality, processing and packaging, as well as its nutritive value—indicates a need for those trained in food science. To meet this need the Graduate School of Nutrition offers an M.F.S. program.

Since all techniques for food processing and handling must be based on a thorough knowledge of food characteristics, the M.F.S. program emphasizes the sciences fundamental to the field: food chemistry, biochemistry, and bacteriology. The student who masters these sciences may easily learn the details of special food techniques on the job. Therefore, the basic academic program does not include training in specialized technology but rather the science courses involved with food processing, packaging, and similar areas.

Students become acquainted with the several research projects in process, including studies of food spoilage, flavor, composition, presentation, fermentation, and irradiation effects. They then choose a staff adviser in whose field their own interests lie. Work on the required special research problem may be conducted at the Ithaca campus or

at the New York State Agricultural Experiment Station at Geneva, New York, depending on the type of research problem selected.

The Ph.D. Degree at Cornell

At Cornell, all graduate programs for the Ph.D. degree are under the jurisdiction of the Graduate School of the University and are directed by Fields. Faculty members of the Graduate School of Nutrition are members of certain Fields of the Graduate School, such as Biochemistry, Nutrition, Food and Nutrition, Food Science and Technology, Physiology and Agricultural Economics. The academic background of a professor determines the Field in which he is appointed.

Graduate training and research are major responsibilities of the core faculty of the Graduate School of Nutrition. Through this faculty and its research, training for the Ph.D. degree is carried out in the School. More than half of the students completing Master's degrees at the School continue toward a Ph.D. degree with the advantage of doing so without disturbing the continuity of their studies. Many candidates for the Ph.D. continue to work with their original advisers because the students have a research interest developed by their professors during the Master's degree program.

Postdoctoral Studies

As in all scholarly pursuits, training in research does not end with a doctoral degree. It is becoming more and more common for students receiving the Ph.D. degree in the natural sciences to continue their training in research for one or two postdoctoral years. Mature scientists also frequently seek an opportunity to revitalize their research programs, using sabbatical or other types of leaves from their home institutions to come here for additional research experience. Thus there are always some of these scientists working at the postdoctoral level at the Graduate School of Nutrition; not only do they gain from the experience, but their presence here is stimulating to the staff and students of the School.

ADMISSION REQUIREMENTS

To be admitted to a Master of Nutritional Science or a Master of Food Science degree program in the Graduate School of Nutrition, an applicant must hold a baccalaureate degree from a college or university of recognized standing, or have completed work equivalent to that required for such a degree at Cornell. He must show promise of ability to pursue advanced study and research satisfactorily, as judged by his previous record. To enter graduate study the applicant must also have adequate preparation and a definite interest in his chosen field of specialization,

14 ADMISSION REQUIREMENTS

although his previous academic training need not necessarily be in the field of nutrition.

All applicants for admission and fellowship consideration are urged to take the Graduate Record Examination (GRE) Aptitude Tests (Verbal and Quantitative) of the Education Testing Service, and to have the scores sent to the Cornell Graduate School as part of their application materials. Information about the times and places of test administrations may be obtained directly from the Educational Testing Service, Princeton, New Jersey 08540.

English Proficiency Requirement

Foreign applicants whose native language is not English and who have not received their secondary school or university education in the English language must take the Test of English as a Foreign Language by arrangement with Educational Testing Service, Princeton, New Jersey 08540, U.S.A., or the Michigan English Language Test by arrangement with the English Language Institute, University of Michigan, Ann Arbor, Michigan 48104, U.S.A. The test scores must be reported directly by the testing organization to the Graduate School as part of the essential application information, and no final action on applications will be taken until the scores have been received. Both testing programs are available throughout the world. Information on times and places for administration of the tests may be obtained directly from the addresses given above. Since these tests are diagnostic, admission to those applicants whose scores indicate unsatisfactory command of English may be denied or may be made contingent upon evidence of improved command of English.

If English has been the medium of instruction in the secondary school or university, a statement to this effect signed by a responsible officer of a United States Embassy or Consulate or by an appropriate official of the educational institution involved should be sent to the Graduate School.

Academic Requirements

To qualify for admission, an applicant must have completed, with an above average record, courses in the following subjects with the approximate number of semester hours as stated. A weekly one-hour lecture per fifteen-week term is approximately equal to one semester hour credit. An applicant who cannot meet in full the specific course requirements may be admitted if the faculty of the School so recommends, with the understanding that the deficiencies must be made up before graduation without credit toward the degree.

PHYSICAL SCIENCES. A total of twenty semester hours divided among chemistry, physics, and mathematics are required. Courses in quantitative chemistry and organic chemistry are prerequisites to courses required

for graduation. If they are not offered for entrance, they must be taken following admission. Students who enter without college training in physics are required to take an elementary course in that subject before graduation.

BIOLOGICAL SCIENCES. For candidates for the M.N.S. degree a total of twelve hours in such courses as biology, botany, zoology, microbiology and physiology are required. Courses in animal or human nutrition may be counted (up to three credit hours) in the biological sciences. For candidates for the M.F.S. degree, eight hours are required in the biological sciences. Elementary courses in microbiology or physiology taken following admission to complete entrance requirements cannot be counted toward graduation. However, an elementary course in microbiology is prerequisite for advanced courses in microbiology.

SOCIAL STUDIES. A total of nine hours in such subjects as economics, government, education, psychology, anthropology, and history must be offered for entrance.

OTHER COURSES. The applicant's record must show evidence that he has satisfactorily completed other courses prerequisite to those required by a candidate for a degree.

Dean Barnes discussing a research problem with a graduate student.



Nondegree Applicants

When staff and facilities are available, some applicants who do not intend to work toward an advanced degree at Cornell may be admitted. Normally such students wish to achieve particular objectives by taking courses and special training in graduate nutrition programs. In order to be admitted in a nondegree program, a student should have a Bachelor's degree although, with appropriate justification, this requirement may be waived. These special students are not subject to the standard course requirements for admission to the Graduate School of Nutrition, nor to requirements for course work to be completed for graduate degrees. Registration in such a program is restricted to two semesters.

University Health Requirements

The following health requirements for entering graduate students have been adopted by the Cornell Board of Trustees. Failure to fulfill these requirements will result in loss of the privilege of registering the following term. The responsibility for fulfilling these requirements rests with the student.

IMMUNIZATION. A satisfactory certificate of immunization against smallpox, on the form supplied by the University, must be submitted before registration. It will be accepted as satisfactory only if it certifies that within the last three years a successful vaccination has been performed. If this requirement cannot be fulfilled by the student's home physician, opportunity for immunization will be offered by the Cornell medical staff during the student's first semester, with the cost to be borne by the student. If a student has been absent from the University for more than three years, immunity will be considered to have lapsed, and a certificate of revaccination must be submitted.

It is strongly recommended by the University Health Services that all graduate students have immunization against tetanus before entering the University. All graduate students may, however, obtain initial and all booster tetanus toxoid immunizations at the Gannett Clinic for a nominal charge.

HEALTH HISTORY. Graduate students, when accepted, must submit health histories on forms supplied by the University. These should be returned promptly to the Gannett Medical Clinic. A University physician will review the material before it becomes part of the student's permanent health record. All information given is confidential. After arrival at Cornell, if the medical history indicates a need, a student will be given an appointment to consult a physician at the Clinic. When a student has been away from the University for more than a year, he must, upon reentrance, submit an interim health history on a University form.

X RAY. Every student is required to have a chest x ray. Opportunity is given to satisfy this requirement during the student's first week on campus. The cost of the x-ray examination is included in the General Fee. When a student who has been away from the University for more than a year wishes to reenter, he must, at his own expense, again fulfill the chest x-ray requirement.

Applications and Registration

Applicants for admission should address their inquiries to the Office of the Graduate School, Sage Graduate Center, Cornell University, Ithaca, New York 14850. The form the applicant will receive is one which is used in all areas of graduate study and does not apply in all of its details to Graduate School of Nutrition applicants. In completing the form, applicants should indicate an interest in either *nutritional science for the M.N.S. degree or in food science for the M.F.S. degree in the Graduate School of Nutrition*. In neither program is it necessary to indicate a minor area of study. No application will be acted upon until all credentials enumerated in the application form have been filed.

All students admitted to the Graduate School of Nutrition must register through the Graduate School Office, Sage Graduate Center, at the beginning of each term or session.

REQUIREMENTS FOR GRADUATION

The degrees of Master of Nutritional Science (M.N.S.) and Master of Food Science (M.F.S.) are awarded by the Cornell University Graduate School after satisfactory completion of a special research problem and courses considered basic to an understanding of nutritional or food science.

For graduation a student must have completed the necessary residence requirements (page 22) and have obtained at least a B— grade in a minimum of thirty semester hours of specified and approved courses. An additional six to ten semester hours must be completed in a special research problem. A weekly one-hour lecture per fifteen-week term is approximately equal to one semester hour credit. The student must prepare a written report on this approved special research problem and must pass a final oral examination on the report and related course work.

To round out the professional training in nutritional or food science, the student's adviser and the faculty of the Graduate School of Nutrition may require him to take certain courses deemed appropriate to his field of interest. In the event that certain required courses have been satisfactorily completed by the student prior to his entrance to the School, substitutions will be made with the approval of his adviser.

The curriculum differs in accordance with the field in which the student specializes as follows:

Nutritional Science

The specialized training in the field of nutritional science, leading to the degree of Master of Nutritional Science, emphasizes the basic scientific knowledge and techniques of nutrition.

Faculty advising students for the M.N.S. degree include Professors R. H. Barnes, A. Bensadoun, D. L. Call, C. L. Comar, Louise J. Daniel, Elizabeth A. Donald, J. L. Gaylor, L. R. Hackler, D. E. Hogue, L. Krook, M. C. Latham, F. W. Lengemann, J. K. Loosli, L. Lutwak, D. B. McCormick, W. G. Merrill, Mary A. Morrison, W. L. Nelson, M. C. Nesheim, Katherine J. Newman, W. G. Pond, J. T. Reid, Jerry M. Rivers, Daphne A. Roe, M. L. Scott, S. E. Smith, Jean T. Snook, K. L. Turk, W. J. Visek, R. G. Warner, R. H. Wasserman, H. H. Williams, M. J. Winick, L. D. Wright, Charlotte M. Young, R. J. Young, and D. B. Zilversmit.

The minimum curriculum to be completed, including the number of semester hours required and courses generally taken to fulfill the requirement follows:

BIOCHEMISTRY. Seven semester hours. Courses approved to fulfill this requirement are listed in the biochemistry section of the Description of Courses (page 36).

PRINCIPLES OF NUTRITION. Three semester hours. One of the following courses is generally taken: Food and Nutrition 332 (page 28), Animal Science 410 (page 30), or School of Nutrition 520 (page 28).

LABORATORY WORK IN NUTRITION. Three semester hours. Students generally take Animal Science 511 (page 30) or Food and Nutrition 524 (page 29).

ADVANCED PHYSIOLOGY. Six semester hours. Students generally take Biological Sciences 414 (page 49).

FOOD ECONOMICS. Three semester hours. Students generally take School of Nutrition 159 (page 39).

STATISTICS. Three semester hours. One of the following courses is usually taken: Statistics and Biometry 510 or 511, or Industrial and Labor Relations 510 (page 44).

SEMINARS. One semester hour. One of the following seminars is usually chosen: School of Nutrition 292, Food and Nutrition 605, or Animal Science 619 (page 53).

SPECIAL PROBLEM. Six to ten semester hours. (See page 20 for details.)

ADVANCED COURSES IN NUTRITION. Four semester hours. Courses approved for this credit are listed below in the order found in the Description of Courses (page 27):

		<i>Semester Hours</i>
Food and Nutrition 501	Proteins and Amino Acids	2
Poultry Science 502	Lipids and Carbohydrates	2
Animal Science 503	Nutritional Energetics	2
Poultry Science 504	Minerals and Vitamins	2
* Food and Nutrition 332	Principles of Human Nutrition	3
Food and Nutrition 441	Nutrition and Disease	3
Food and Nutrition 442	Advanced Human Nutrition	2
Food and Nutrition 512	Nutrition and Growth	2
Food and Nutrition 514	Readings in Nutrition	2
School of Nutrition 100	International Nutrition Problems, Policy and Programs	3
School of Nutrition 392	Clinical and Public Health Nutrition	3
* Animal Science 510	Special Topics in Animal Nutrition	1
Biological Sciences 530	Biochemistry of the Vitamins	2
* Biological Sciences 537	Advanced Biochemistry	1 or 2
* Biological Sciences 538	Advanced Biochemistry	1 or 2
Veterinary Pathology 931	Pathology of Nutritional Diseases	3

* Approved for credit if not taken previously to fulfill Principles of Nutrition requirement.

^b Approved for credit only if suitable topic.

These are the minimum course requirements for the M.N.S. degree and are normally supplemented with additional courses.

Food Science

The specialized training in this field, leading to the degree of Master of Food Science, emphasizes the sciences involved in food processing and utilization.

Faculty advising students for the M.F.S. degree include Professors Gertrude D. Armbruster, R. C. Baker, P. A. Buck, R. K. Finn, J. D. Hartman, Elizabeth E. Hester, F. M. R. Isenberg, L. R. Mattick, Nell Mondy, J. C. Moyer, W. B. Robinson, H. W. Seeley, R. S. Shallenberger, R. M. Smock, K. H. Steinkraus, J. P. VanBuren and G. H. Wellington.

The curriculum to be completed including the number of semester hours required and courses generally taken to fulfill the requirement follows:

BIOCHEMISTRY. Seven semester hours. Courses approved to fulfill this requirement are listed in the biochemistry section of the Description of Courses (page 36).

ADVANCED COURSES IN BACTERIOLOGY. Six semester hours. Courses approved to fulfill this requirement are listed in the microbiology section of the Description of Courses (page 45).

20 REQUIREMENTS FOR GRADUATION

STATISTICS. Three semester hours. One of the following courses is usually taken: Statistics and Biometry 510 or 511, or Industrial and Labor Relations 510 (page 44).

NUTRITION. Three semester hours. One of the following courses is usually taken: Food and Nutrition 332 (page 28), Animal Science 410 (page 30) or School of Nutrition 520 (page 28).

SEMINARS. One semester hour. One of the following seminar courses is usually chosen: Food and Nutrition 605 or Food Science 600.

SPECIAL PROBLEM. Six to ten semester hours. (See page 20 for details.)

APPROVED COURSES IN FOOD SCIENCE. Eleven semester hours. Courses approved for this credit are listed below in the order found in the Description of Courses (page 27):

	<i>Semester Hours</i>
School of Nutrition 100	International Nutrition Problems, Policy and Programs 3
Biological Sciences 530	Biochemistry of the Vitamins 2
Food Science 410	Food Biochemistry 3
School of Nutrition 159	Food Economics 3
Food Science 302	Dairy and Food Engineering 4
Food Science 401	Food from Fermentations 5
Food Science 404	Chemistry of Milk 2
Food Science 413	Analytical Methods 4
Food and Nutrition 446	Science of Food 3 or 4
Food and Nutrition 447	Science of Food, Laboratory 1
Food and Nutrition 456	Experimental Food Methods 2
Food and Nutrition 500	Special Problems for Graduate Students*
Food and Nutrition 516	Readings in Food 2
Poultry Science 450	Poultry Meat and Egg Technology 3
Pomology 201	Postharvest Physiology, Handling and Storage of Fruits 3
Vegetable Crops 412	Handling and Marketing Vegetables, Advanced Course 4

* Credit hours as arranged.

These are minimum course requirements for the M.F.S. degree and are normally supplemented with additional courses.

Special Research Problem—Report and Examination

The research involved in the special problem report which should be of thesis quality, is required for both degrees and may be directed by

any joint faculty member of the student's choice who is willing to supervise it. However, members of the core staff serve as advisers most frequently. The research problem is normally assigned by the student's faculty adviser.

A written report of the special research problem and a final oral examination covering both research report and course work are required for either degree. The examination is arranged at a time suitable to the examining committee which is comprised of the student's adviser plus at least one other member of the faculty to be designated by the faculty of the Graduate School of Nutrition or its delegated agent. A legible copy of the report as approved by the student's adviser must be submitted to the examining committee at least one week prior to the final examination.

The final copy of the written report, including any changes recommended by the examining committee, must be submitted to the Office of the Dean of the Graduate School of Nutrition as soon as possible after the final examination. This report should be typed, double spaced, on $8\frac{1}{2} \times 11$ inch paper. Either the original ribbon copy on Cornell bond paper, or a good quality Xerox copy, should be bound in lettered black cloth. An appropriate copy must be presented to the student's faculty adviser. Further directions concerning the form in which the

The Reference Room in Savage Hall is maintained for the convenience of the faculty and the students of the Graduate School of Nutrition.



22 TUITION AND FEES

report is to be submitted may be obtained from either the student's faculty adviser or the Office of the Dean of the Graduate School of Nutrition.

The written report of the special research problem and the final oral examination must be completed by the deadline set by the Graduate School in order to graduate the same term. Convocation exercises are generally held in January, June, and September of each year.

Residence Requirements

Residence will vary with the candidate's background, training, and experience; but to receive a degree from the Graduate School of Nutrition, a student must complete at least two units of residence at the School after receiving a Bachelor's degree from Cornell or elsewhere. Full-time study for one semester with satisfactory accomplishment constitutes one residence unit. In most instances, the time required to obtain the degree exceeds the minimum requirements and generally takes two years including one summer.

SUMMER SESSION STUDY

A student registered in the Graduate School of Nutrition may receive credit for courses completed at the University during the summer if his program is approved in advance by his faculty adviser. To receive this credit he must also be registered in the University Summer Session.

The student may earn residence credit by registering for a minimum of four and a maximum of twelve weeks for summer research on his individual problem under the personal direction of a member of the faculty of the School. The student thus uses the summer period to meet, in whole or in part, the requirements of six to ten semester hours for the Special Problem (page 20).

To receive credit for summer courses and/or research, students must complete official registration using forms provided by the Office of the Registrar and administered by the Office of the Summer Session. The rate of tuition is \$50.00 per credit; the general fee is \$5.00 per week.

TUITION AND FEES

REGISTRATION FEE. A registration fee of \$35.00 must be made by every applicant accepted for admission unless the candidate has previously matriculated as a student at Cornell University. A check or money order payable to Cornell University should be remitted to the Graduate School, Sage Graduate Center, upon notification of acceptance. This fee pays the matriculation fee, chest x-ray fee, and examination book charge, and covers certain expenses incurred at graduation if the student receives a degree. The fees will not be refunded to any candidate who withdraws his application after May

22, or after twenty days following his admission approval. This fee is *not* covered by University fellowships, scholarships or assistantships.

TUITION. The tuition for students registered in the Graduate School of Nutrition is \$200 per term payable at the beginning of each term. Certain assistantships carry a waiver of tuition.

GENERAL FEE. A General Fee of \$275 a term payable at the beginning of each term is required of each registrant of the Graduate School of Nutrition. The General Fee contributes toward the services supplied by the libraries, Clinic, Sage Infirmary, and the student union in Willard Straight Hall, and pays a portion of the extra cost of laboratory courses and general administration.

SUMMER SESSION FEE. All students of the Graduate School of Nutrition who attend classes or do research in the Summer Session must register both in the Graduate School and in the Summer Session to receive credit. Registration forms are provided by the Office of the Registrar and administered by the Office of the Summer Session. The rate of tuition is \$50.00 per credit hour; the general fee is \$5.00 per week.

IN ABSENTIA. A graduate student registered *in absentia* will pay a fee of \$35.00 each term.

LIMITED REFUNDS. Limited refunds of the General Fee and tuition will be made to students who withdraw from the University prior to completion of a term, for reasons accepted as satisfactory. Students who withdraw are charged tuition and the General Fee at a rate of 10 per cent for each week or fraction of a week from registration to the effective date of withdrawal. However, the refund will be made according to the number of instructional days elapsed if a student leaves for one of the following reasons: completion of degree requirements, military service, or on recommendation of University health services. A student arranges for withdrawal at the Graduate School Office. No charge is made if the student withdraws within six days of registration. No part of the Registration Fee is refundable.

The amount, time and manner of payment of tuition, fees or other charges may be changed by the Board of Trustees at any time without previous notice.

ASSISTANTSHIPS AND TRAINEESHIPS

A number of assistantships and traineeships are available in the School's research programs, and any student admitted to the School may apply in writing to the Secretary, Graduate School of Nutrition, for this type of financial aid (no special application form is provided). The term of and stipend for each appointment are determined on an individual basis after the student has been accepted by the Graduate School. For

September appointments, applications should be made by March 1, and announcement of appointments will be made on or about April 1.

Traineeships in Public Health

Students interested in preparing for positions as public health nutritionists may apply for public health traineeship awards from the U.S. Public Health Service. Applicants may secure application forms and additional information from any of the Regional Medical Directors of the U.S. Public Health Service or from the Chief, Division of General Health Services, Bureau of State Services, Public Health Service, Department of Health, Education, and Welfare, Washington, D.C.

ADVISORY SERVICE FOR CORNELL UNDERGRADUATES

Undergraduates in the Colleges of Agriculture, Arts and Sciences, or Home Economics who are interested in graduate work in nutrition may have their undergraduate curriculum planned by members of the faculty of the Graduate School of Nutrition who are also members of the faculty of the college in which the student matriculates. Courses are selected by the adviser to provide the undergraduate with the best background for continuing in a Master's degree program in his chosen area of specialization in nutrition. Only in this way can some students complete the M.N.S. or M.F.S. degree with the minimum residence requirement of two units of residence.

HEALTH SERVICES AND MEDICAL CARE

Health services and medical care for students are centered in two Cornell facilities: the Gannett Medical Clinic (out-patient department) and the Sage Infirmary. Students are entitled to unlimited visits at the Clinic (appointments with individual doctors at the Clinic may be made, if desired, by calling or coming in person; an acutely ill student will be seen promptly whether he has an appointment or not). Students are also entitled to laboratory and x-ray examinations indicated for diagnosis and treatment, hospitalization in the Sage Infirmary with medical care for a maximum of fourteen days each term, and emergency surgical care. The cost of these services is covered in the General Fee.

On a voluntary basis, insurance is available to supplement the services provided by the General Fee. For further details, including charges for special services, see the *Announcement of General Information*. If, in the opinion of the University authorities, the student's health makes it unwise for him to remain in the University, he may be required to withdraw.

If a student prefers to consult a private physician rather than go to the Clinic, or to have the services of a private doctor while a patient in the Infirmary, he must bear the cost of these services.

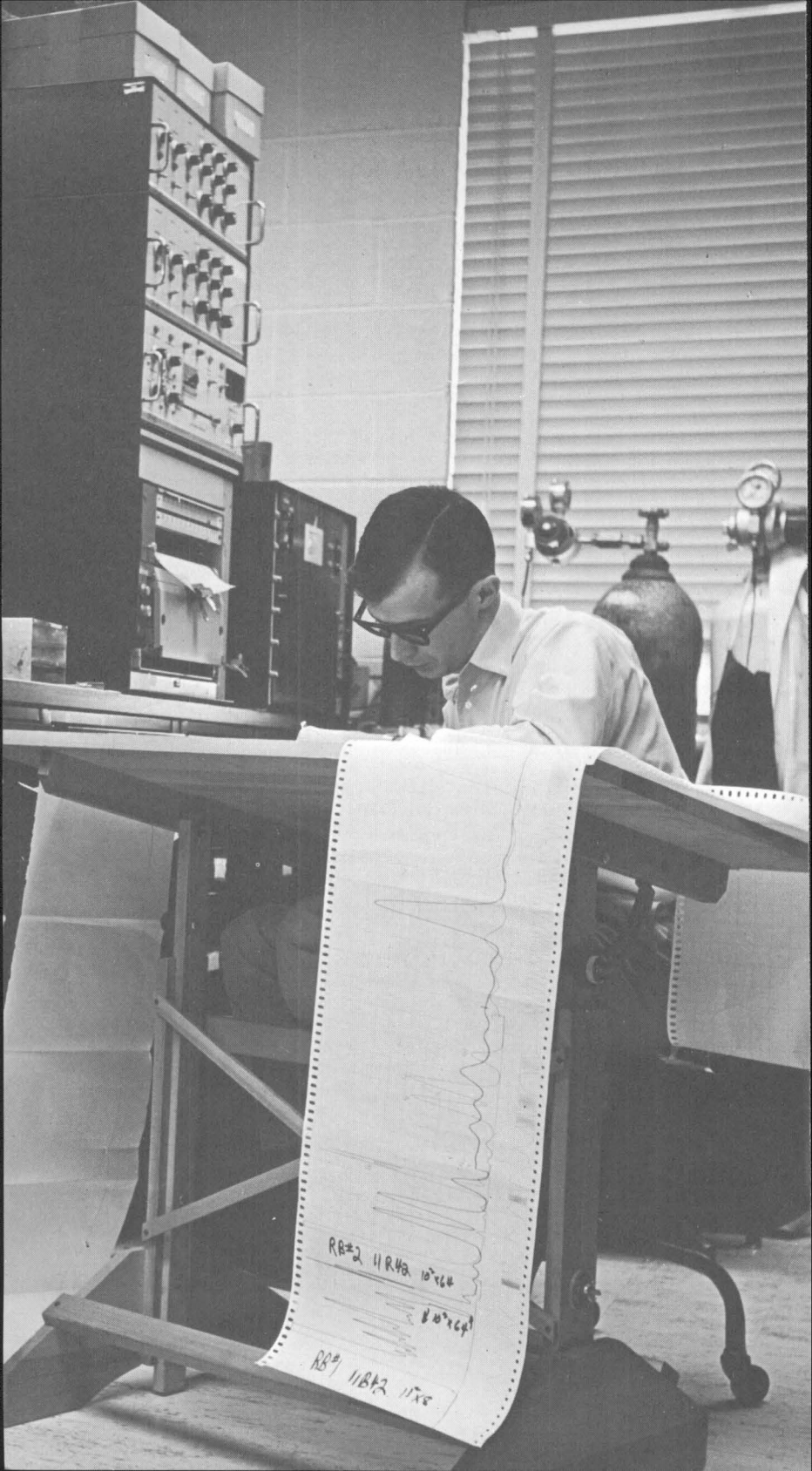
GRADUATE HOUSING

DORMITORY ACCOMMODATIONS. Sage Hall, The Graduate Center, provides dormitory housing for approximately 200 men and women. Situated in the center of the campus, it is convenient to all colleges. The Graduate Center is available for use by all graduate students and faculty and contains a cafeteria seating 200, study rooms, and lounges. In addition to Sage Hall, Cascadilla Hall accommodates approximately 160 graduate men. Applications for dormitory accommodations may be obtained any time after January 1 for the coming academic year by writing the Department of Housing and Dining Services, 223 Day Hall.

FAMILY ACCOMMODATIONS. The University, through the Department of Housing and Dining Services, has three apartment developments for married students and their families. They are Cornell Quarters, Pleasant Grove Apartments, and Hasbrouck Apartments, with total housing for about 400 families. All apartments are unfurnished. For further information and application, write the Department of Housing and Dining Services, Room 223, Day Hall.

OFF-CAMPUS HOUSING. The University requires all students to live in housing which is approved by the University Student Housing Agency. Continuing registration at the University is contingent upon meeting this requirement.

To assist students, both married and single, to secure adequate housing, the University Student Housing Agency provides an inspection and information service. Information on properties which have University approval, and approved housing *currently available* is posted for convenience in the Off-Campus Housing Office in Day Hall, Room 223. Because changes of currently available apartments occur daily, it is not practical to prepare lists. If at all possible, a student should plan to visit Ithaca well in advance of residence to obtain suitable quarters.



DESCRIPTION OF COURSES

The following list of courses includes both those specified previously as required for the degrees offered and some of those from which the student may select electives, with the approval of his faculty adviser, in accordance with his specific field of interest.

The information in parentheses following the name of the course refers to the department or the division in which the course is given, and the course number. Information in brackets indicates that the course is not given in 1969-70. In registering for any of these courses, list the course number and the department or division immediately preceding it, rather than the name of the course. The time and, in some instances, the place are not given in the descriptive material following the title of the course. To obtain this information the student should consult the specific departmental office or the individual *Announcements* issued by the colleges concerned.

Courses marked with an asterisk () are acceptable to meet the "advanced nutrition" credit requirement. Those marked with a dagger (†) are acceptable to meet the "advanced food science" credit requirement.*

NUTRITION

In this area some courses are more oriented toward human nutrition and others are more oriented toward animal nutrition. Although courses based on experimental animal nutrition are often fundamental to a knowledge of human nutrition, a clear-cut distinction is not implied in the following course groupings.

ADVANCED NUTRITION SERIES (501-504)

A series of nutrition courses offered jointly by the Department of Food and Nutrition, College of Home Economics; the Departments of Animal and of Poultry Husbandry, College of Agriculture; and the Graduate School of Nutrition. Prerequisites, courses in nutrition, physiology, and biochemistry to include intermediary metabolism; or permission of the instructor.

The biochemical and physiological bases of digestion, absorption, transport and metabolism of nutrients; species differences where applicable; and historical as well as current concepts in nutrition.

PROTEINS AND AMINO ACIDS*

(Food and Nutrition 501)

Fall. Credit two hours. Lectures, W F 10:10. Van Rensselaer NG-6.
Professor Morrison.

LIPIDS AND CARBOHYDRATES*

(Poultry Science 502)

Fall. Credit two hours. Lectures, T Th 11:15. Rice 300.
Professor Bensadoun.

NUTRITIONAL ENERGETICS*

(Animal Science 503)

Spring. Credit two hours. Lectures, M W 10:10. Morrison 342.
Professor Reid.

Analyzing gas chromatography records for a cholesterol study.

MINERALS AND VITAMINS*

(Poultry Science 504)

Spring. Credit two hours. Lectures, T Th 11:15. Rice 201.
Professor Scott.

GENERAL NUTRITION

(School of Nutrition 520)

Fall. Credit three hours. Prerequisite, taken with or following Biological Sciences 431 or its equivalent. Lectures, M W F 11:15. Savage 130. Professor Lutwak and staff.

This course is offered to students whose principal academic training has been in a field other than nutrition. It is designed to meet their need for a basic but intensive introduction to the principles, history, and applications of nutrition.

Human Nutrition

MATERNAL AND CHILD NUTRITION

(Food and Nutrition 322)

Fall and spring. Credit two hours. Prerequisite, Food and Nutrition 112 or 115. Not designed for Food and Nutrition majors. Major with special interest in this subject may request permission to register for Food and Nutrition 512 as seniors. Lectures and discussion, W F 8. Van Rensselaer 339. Associate Professor Newman.

Family nutrition with special emphasis upon the nutritional needs of the mother and child. Relation of nutrition to physical growth.

PRINCIPLES OF HUMAN NUTRITION*

(Food and Nutrition 332)

Spring. Credit three hours. Prerequisites, Food and Nutrition 112 or 115 and a college course in biochemistry and in physiology. Discussion, T Th 9:05. Van Rensselaer 339. Associate Professor Newman.

Principles of nutrition as they relate to energy metabolism, proteins, fats, minerals, and vitamins. Use of professional literature to acquaint the student with considerations involved in the application of nutrition information to human nutrition problems, to illustrate methods used in studying nutrition, and to provide experience in interpretation of scientific reports.

NUTRITION AND DISEASE*

(Food and Nutrition 441)

Fall. Credit three hours. Prerequisite, Food and Nutrition 332 or equivalent. Discussion, M W F 9:05. Van Rensselaer NG-31. Associate Professor Rivers.

Study of the physiological and biochemical anomalies in certain diseases and the principles underlying nutritional therapy. Independent survey of the technical literature in this field.

ADVANCED HUMAN NUTRITION*

(Food and Nutrition 442)

Fall. Credit two hours. Prerequisite, Food and Nutrition 332 or equivalent. Van Rensselaer 339. Professor Morrison.

Recent advances in nutrition. Emphasis on human nutrition.

NUTRITION AND GROWTH*

(Food and Nutrition 512)

Fall. Credit two hours. Prerequisite, Food and Nutrition 332 or equivalent. Signature of instructor required for undergraduate students. Lectures, T Th 10:10. Van Rensselaer 301. Associate Professor Newman.

Information on growth which is of particular interest to nutritionists. Survey of methods used in studying physical and chemical growth. Relation between nutrition and growth.

READINGS IN NUTRITION*

(Food and Nutrition 514)

Spring. Credit three hours. Prerequisite, Food and Nutrition 332 or equivalent. Lectures, T Th 11:15 and an additional hour to be arranged. Assistant Professor Snook.

Critical review of literature on selected topics in the field of nutrition. Emphasis on human nutrition. Topics are changed each term so the course may be repeated for credit with permission of the instructor.

RESEARCH METHODS IN HUMAN METABOLIC STUDIES

(Food and Nutrition 524)

Spring. Credit three hours. Prerequisites, Food and Nutrition 332 or equivalent, laboratory experience in biochemistry or quantitative analysis, and permission of the instructor. Lecture and laboratory, T Th 2-4:25. Van Rensselaer 353. Associate Professor Donald and Department faculty.

Principles of human metabolic research; experimental design of human studies; dietary considerations; methods of collecting and analyzing biological material; and evaluation. Laboratory will include planning and management of a metabolic study, collection and the appropriate analysis of blood, urine, and feces.

INTERNATIONAL NUTRITION PROBLEMS, POLICY AND PROGRAMS*†

(School of Nutrition 100)

Spring. Credit three hours. Registration by permission. Lectures, T Th 11:15-12:45. Savage 130. Professor Latham.

A review of food and nutrition problems, policy and programs especially as they relate to developing countries. Emphasis is placed on the need to coordinate the efforts of various government ministries or departments including those of agriculture, education, economics, health and community development. Among topics discussed are planning and evaluation of applied nutrition programs; education and training in nutrition; the importance of social and cultural factors; methods of increasing the use of protein-rich foods; assessment of nutritional status; the role of FAO, WHO, UNICEF and other agencies; action in case of famine; the integration of nutrition with other projects of disease control in developing countries.

INTERNATIONAL FOOD DEVELOPMENT

(Food Science 403)

Fall. Credit three hours. Lectures, M W 2-4:25. Professor Kosikowski. Given in alternate years. Offered in 1969.

A study of programs, technical problems, and progress associated with developing acceptable food supplies in critical world areas. Proposals for increasing world protein resources for the human are to be discussed. Special attention is to be directed to the organization, operations, relationships, and contributions of U.N. technical agencies, FAO, UNICEF, WHO, and governmental and nongovernmental organizations in the field.

CLINICAL AND PUBLIC HEALTH NUTRITION*

(School of Nutrition 392)

Spring. Credit three hours. Prerequisites, a course in nutrition, in physiology, and in biochemistry. Registration by permission of the instructor. For graduate students only. Lectures to be arranged. Professor C. M. Young and Assistant Professor Roe.

Designed to familiarize the student with some of the applications of nutrition to clinical and public health problems.

Animal Nutrition

PRINCIPLES OF ANIMAL NUTRITION

(Animal Science 410)

Fall. Credit three or four hours. Prerequisites, a course in human or veterinary physiology and a course in organic chemistry or biochemistry or permission of instructor. Lectures, M W F 10:10. Laboratory, optional, S 8-11. Morrison 342. Professor Loosli, Associate Professor Nesheim and Assistant Professor Hintz.

The chemistry and physiology of nutrition and the comparative nutritive requirements of maintenance, growth, reproduction, egg production, and lactation.

SPECIAL TOPICS IN ANIMAL NUTRITION*

(Animal Science 510)

Fall. Credit one hour. Registration by permission. Lectures, to be arranged. Morrison 342. Professor S. E. Smith and staff.

A presentation and discussion of the knowledge and techniques of special fields of animal nutrition, with particular reference to farm animals.

LABORATORY WORK IN ANIMAL NUTRITION

(Animal Science 511)

Fall. Credit three hours. Prerequisites, quantitative analysis and Animal Science 410 or its equivalent, or permission of the instructor. Lectures, M W F 2-4:25. Morrison 342 and 443. Professor Warner.

Each student engages in a series of short research projects with experimental animals, such as rats, rabbits, and sheep. Both classical and modern techniques of animal experimentation are considered. The applications of biochemical methods to the solution of animal nutrition problems are included.

Seminars in Nutrition

NUTRITION SEMINAR

(School of Nutrition 292)

Spring. Credit one hour. M 4:30. Savage 100. Registration by permission. Professor Barnes and faculty.

SEMINAR IN HUMAN NUTRITION

(Food and Nutrition 515)

Fall and spring. Credit three hours. Lectures, M W F 9:05. One discussion period per week to be arranged. Assistant Professor Devine.

Designed for graduate students with limited work in Food and Nutrition. The seminar utilizes the lecture and discussion of Food and Nutrition 112

[Continued on p. 35.]

KEY TO THE CAMPUS MAP ON THE FOLLOWING PAGES

- Alumni (Athletic) Fields F5
- Alumni House D3, offices, *Alumni News*
- Artificial Breeders G7
- Bacon Cage E6, athletics
- Bailey Hall D4, auditorium
- Baker Lab. D3, chemistry
- Baker Residences (men) B4-5
- Balch Halls E2, women's residences
- Bard Hall C6, materials science & engineering
- Barnes Hall C5, Campus Store, auditorium
- Barton Hall D5, military training, Safety and Security Div., gymnasium
- Beebe Lake EF3-4
- Big Red Barn D4, alumni ctr.
- Bradfield & Emerson Halls F4-5, agronomy, plant breeding, biometry, veg. crops
- Bruckner Lab. F4, poultry biology research
- Building Care Division G4
- Caldwell Hall E4, entomology (see also Comstock Hall)
- Campus Stores: Barnes C5, Sheldon Ct. C7
- Career, Summer Plans, & Placement Ctr. D5 (14 East Av.)
- Carpenter Hall C6, engineering library, admin.
- Cascadilla Hall B7, graduate students' residence
- Chemistry Research Bldg. (wing of Baker Lab.) D3-4
- Clark Hall D4, physical sciences
- Collyer Boat House, Cayuga Lake Inlet
- Comstock Hall E4, entomology (see also Caldwell Hall), limnology
- Comstock House D2, women's residence
- Cornell Quarters FG7, married students' residences
- Crescent E6, football stadium
- Dairy Cafeteria (Stocking Hall) G5
- Day Hall C5, Univ. admin.
- Dickson Hall E2, women's residence
- Donlon Hall E2, women's residence
- Emerson & Bradfield Halls F4-5 (see Bradfield & Emerson Halls)
- Fernow Hall F4, conservation
- Filter Plant J4
- Fishery Lab. H7
- Food & Laundry Services F7 (Maple Ave.)
- Foundry C3, arch. studio
- Franklin Hall C3, art, Asian studies
- Gannett Medical Clinic C5
- Goldwin Smith Hall C4, arts & sciences
- Golf Course H2
- Graphic Arts Services G6
- Greenhouses E5, H4
- Grumman Hall D6, aero. engineering
- Grumman Squash Cts. E6
- Guterman Bioclimatic Labs. J5
- Hasbrouck Apts. G1-2, married students' residences
- High Voltage Lab. H7 (909 Mitchell St.)
- Hollister Hall C6, civil engineering
- Hoy Field D6, baseball
- Hughes Hall B6, law student residence
- Humanities, Society for D2 (308 Wait Av.)
- Ind. & Labor Relations Conference Ctr. D5
- Ives Hall D5, ind. & labor relations, summer session & extramural courses, Univ. personnel office
- "Japes" E3, recreation, meetings
- Judging Pavilion G5
- Kimball Hall C6, materials processing
- Langmuir Lab., Research Park H2, neurobiology & behavior, computer services
- Library Tower C5
- Lincoln Hall C4, music, theatre arts
- Lynah Hall E5, ice skating, hockey
- Malott Hall D4, business & public admin., hospital admin.
- Mann Hall F4, agric.-home econ. library, finance office, Bailey Hortorium
- McGraw Hall C4, geological sciences, sociology, anthropology
- Minns Garden E5
- Moakley House H2, recreation, golf
- Morrill Hall C4, modern languages, psychology
- Morrison Hall H5, animal science
- Muenschner Poisonous Plants Garden H5
- Newman (Helen) Hall E2-3, women's phys. ed.
- Newman Lab. D4, nuclear studies
- Noyes Lodge D3, recreation, cafeteria
- Noyes Student Ctr. AB5, cafeteria, student activities
- Nuclear Reactor Lab. CD6
- Observatory (Fuertes) F3, astronomy
- Olin Hall C5, chemical engineering
- Olin Library (grad. & research) C4-5
- Ornithology H2 (Sapsucker Woods Rd. via Warren & Hanshaw Rds.)
- Parking Lots E1, J5
- Phillips Hall D6, elec. engineering
- Plant Science E4, genetics, development, and physiology
- Plantations Office G4
- Pleasant Grove Apts. F1-2, married students' residences
- Post Lab. H4-5, floriculture
- Poultry Virus Disease Lab. J5
- Radiation Biology Lab. H2 (Warren Rd.)
- Rand Hall D3, international studies, research in education, teacher prep.
- Research Park H2 (Brown Rd.)
- Residential Club D1, student residence
- Rice Hall F5, poultry science
- Riding Hall & Stables F6 (Rt. 366)
- Riley-Robb Hall G5, agric. engineering
- Risley Hall D2, women's residence
- Roberts Hall E4, agric. admin., biol. sciences, communication arts
- Rockefeller Hall D4, physics
- Sage Chapel C5
- Sage Graduate Ctr. C5, graduate school offices, residence
- Savage Hall D4, nutrition
- Schoellkopf Field & Hall E6, athletics
- Service Building F7 (Dryden Rd.)

A

B

C

D

1

2

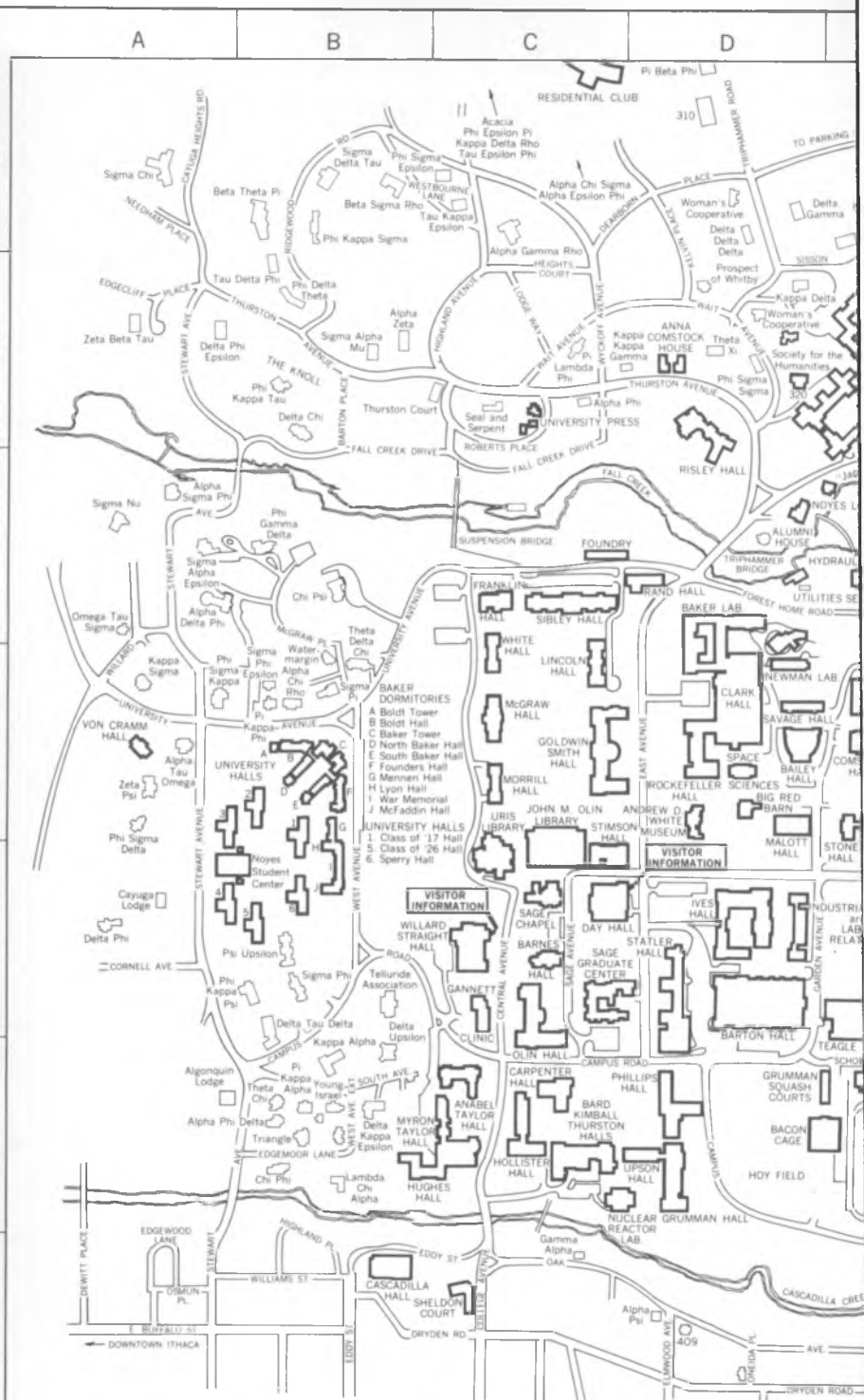
3

4

5

6

7



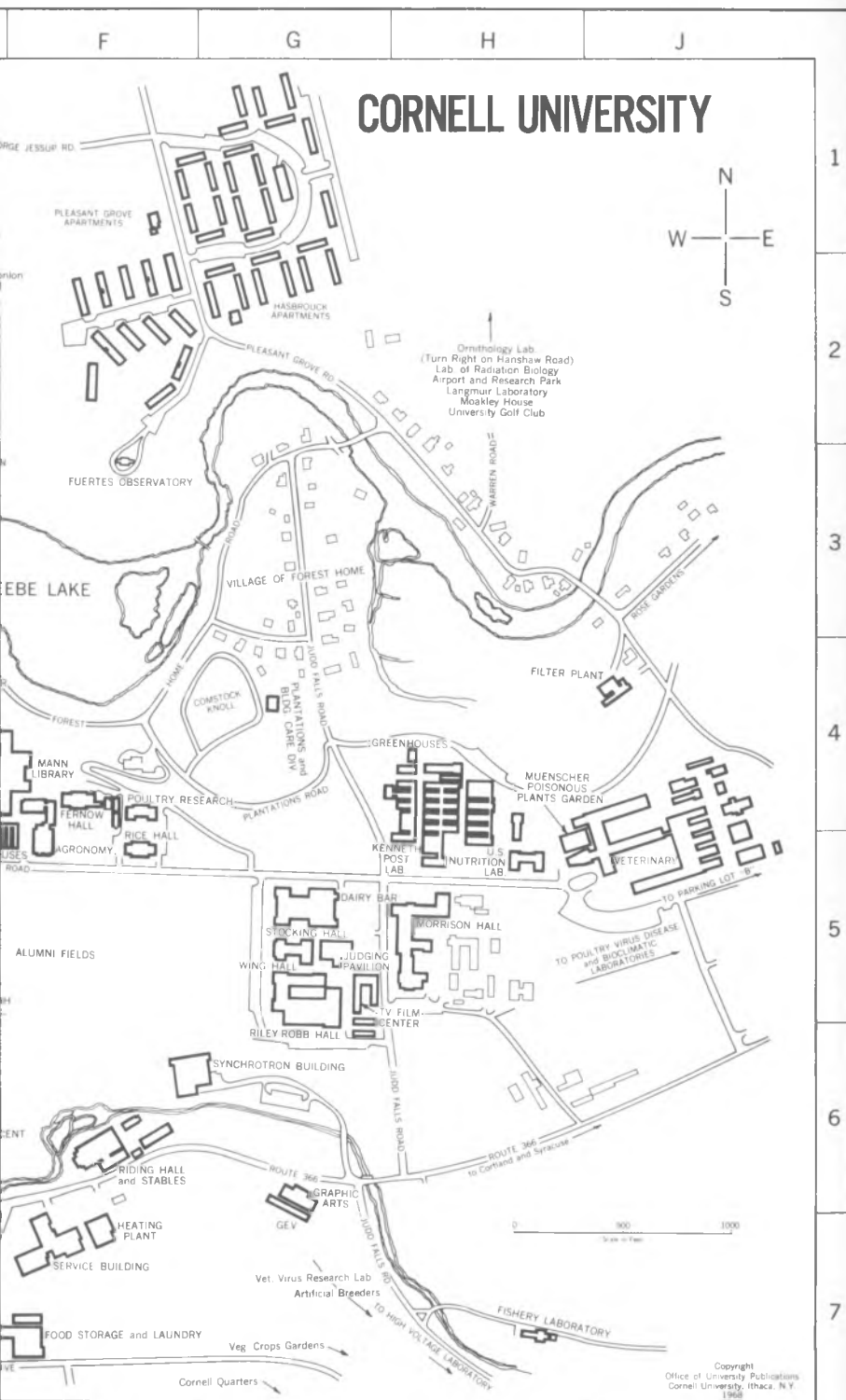
A

B

C

D

CORNELL UNIVERSITY



Copyright
Office of University Publications
Cornell University, Ithaca, N.Y.
1968

34 NUTRITION

[Key to map, continued]

Sheldon Ct. C7, Univ. Publications, Off-Campus Housing, Campus Store
 Sibley Hall C3, arch., art, and planning; history; govt.
 Space Sciences Bldg. D4
 Statler Hall D5, hotel admin.
 Statler Inn D5 (wing of Statler Hall), guest rooms
 Stimson Hall C5, ecology & systematics
 Stocking Hall G5, cafeteria, food science, microbiology
 Stone Hall E4, education
 Suspension Bridge C3
 Taylor (Anabel) Hall C6, interfaith ctr.
 Taylor (Myron) Hall C6, law
 Teagle Hall E5, men's phys. ed., sports
 Television Film Ctr. G5
 Thurston Ct. BC2, student residences
 Thurston Hall C6, theoretical & applied mechanics
 Toboggan Lodge E3, recreation
 Triphammer Bridge & Falls, DE3
 Univ. Halls B4-5, men's residences
 Univ. Press C2
 Upson Hall D6, mech. engineering, computer science

Uris Library (undergraduate) C4-5
 U.S. Plant, Soil & Nutrition Lab. H5
 Utilities Section E3
 Van Rensselaer Hall & North Wing E4, home economics
 Vegetable Crops Garden G7
 Veterinary College J4-5
 Veterinary Virus Research Lab. G7
 Visitor Information Ctrs. (Day Hall, Willard Straight Hall) C5
 von Cramm Scholarship Hall A4, men's residence
 Warren Hall E4, agric. econ., rural sociology
 White Hall C4, mathematics
 White Museum of Art D4
 Willard Straight Hall C5, dining, student activities
 Wilson Synchrotron FG6
 Wing Hall G5, biochemistry, molecular biology
 Women's small dormitory units: Phillips House, 10 Sisson Pl. E1; Prospect of Whitby, 228 Wait Av. D2; 150 Triphammer Rd. D1; 302 Wait Av. D2; Wari, 208 Dearborn Pl. D1; 310 Triphammer Rd. D1.

[Continued from p. 30.]

as a basis for supplemental readings and critical review of research on selected nutritional problems.

SEMINAR IN FOOD AND NUTRITION

(Food and Nutrition 605)

Fall and spring. Credit one hour each semester. T 4:30. Van Rensselaer NG-35. Department faculty.

SEMINAR IN ANIMAL NUTRITION

(Animal Science 619)

Fall. Credit one hour. Open to graduate students with major or minor field of study in animal nutrition. Registration by permission. M 4:30. Morrison 348. Animal Nutrition staff.

A critical review of the literature and other topics of special interest to graduate students in animal nutrition.

PUBLIC HEALTH

CLINICAL AND PUBLIC HEALTH NUTRITION*

(School of Nutrition 392)

Spring. Credit three hours. Prerequisites, a course in nutrition, physiology, and biochemistry. Registration by permission of the instructor. For graduate students only. Lectures to be arranged. Professor C. M. Young and Assistant Professor Roe.

Designed to familiarize the student with some of the applications of nutrition to clinical and public health problems.

ENVIRONMENTAL QUALITY ENGINEERING

(Engineering 2532)

Fall. Credit three hours. Open to noncivil engineering students. Hollister 202. Professor Gates.

Lectures, discussions, reports, and field trips. Environmental health concepts and methods and their application to environmental planning and control at the subdivision, municipal, and metropolitan levels. Introduction to water resource planning and development; water quality control; water supply; municipal, industrial, and private waste-water disposal; air quality control; solid waste disposal and radiological health.

INTRODUCTION TO CLINICAL MEDICINE

(Business and Public Administration 141)

Spring. Credit three hours. Malott Hall.

The objective of this course is to familiarize the student with the principal diseases of modern life and to demonstrate how these conditions are controlled in individuals and in communities. Major emphasis is given to those conditions which directly affect the management of hospitals. Consideration is given to the training of physicians, medical and surgical specialists, nurses, and other personnel; the nature of specialized hospital equipment and other facilities for diagnosis and treatment; and the principal procedures used by physicians in diagnosis and treatment in hospitals and in their offices. Major public health problems of various parts of the contemporary world are discussed, and visits are made to nearby hospitals and medical centers at appropriate points in this course.

SEMINAR IN HEALTH RESEARCH

(Business and Public Administration 455)

Fall. Credit three hours. Malott Hall. Associate Professor White.

The primary objective is to increase the student's ability to evaluate research reports and other studies, to assess their relevance for the field, and to formulate his own problems in a manner conducive to scientific investigation. An examination is made of the contributions of the social sciences and other disciplines to an understanding of current problems in the health field and in hospital administration in particular.

BIOCHEMISTRY

PRINCIPLES OF BIOCHEMISTRY, LECTURES

(Biological Sciences 431)

Fall. Credit four hours. Prerequisite, Organic Chemistry 353-355 or the equivalent. Lectures, M 8, Morrison 146; T Th S 8, Ives 120. Professor Daniel.

A basic course dealing with the chemistry of biological substances and their transformation in living organisms.

PRINCIPLES OF BIOCHEMISTRY, LABORATORY

(Biological Sciences 432)

Spring. Credit three hours. Prerequisites, quantitative analysis or permission of the instructor. Must be taken with or following Biological Sciences 431. Laboratory, M W or Th 2-4:25. Wing 106. Discussion period M 1:25. Riley-Robb 105. Preliminary examinations on March 5 and April 9, 1970, will be held at 7:30 P.M. Associate Professor Neal and Assistant Professor Fessenden.

BIOCHEMISTRY OF THE VITAMINS*†

(Biological Sciences 530)

Spring. Credit two hours. Prerequisites, Chemistry 353-355 and Biological Sciences 431 or their equivalents. Lectures, T Th 10:10. Savage 100. Professor Daniel. Offered in alternate years. Offered in 1970.

The chemical and biochemical aspects of the vitamins.

GENERAL BIOCHEMISTRY, LECTURES

(Biological Sciences 531-532)

Fall and spring. Credit four hours a term. Prerequisite, Chemistry 358, physical chemistry desirable. Lectures, M W F S 9:05. Riley-Robb 125.

An integrated treatment of the fundamentals of biochemistry. Fall semester: proteins, enzymes and the nature of enzymatic catalysis; carbohydrate metabolism; nitrogen metabolism. Assistant Professor Calvo and staff. Spring semester: energetics; lipid metabolism; biosynthesis of macromolecules. Associate Professor Guillery and staff.

GENERAL BIOCHEMISTRY, LABORATORY

(Biological Sciences 533)

Fall. Credit three hours. Prerequisites, Chemistry 358 and Chemistry 288 or 390. Must be taken with or following Biological Sciences 531. Laboratory, T or Th 9:05-4:25. Wing 107. One discussion period to be arranged. Professor Nelson and Assistant Professors McCarty and Wharton.

The first meeting for both sections will be held on the first Tuesday of the fall term at 9:05. Selected experiments on carbohydrates, proteins, amino acids, and metabolism (cellular particulates, kinetics, general enzymology)

will be given to illustrate basic biochemical principles. The course will emphasize the quantitative aspects rather than qualitative identification.

ADVANCED BIOCHEMICAL METHODS, LABORATORY

(Biological Sciences 536A)

Spring. Credit two hours. Prerequisite, Biological Sciences 533. Graduate majors in biochemistry only. Hours to be arranged. Assistant Professor Keller and Associate Professor Wu.

Research techniques in biochemistry and molecular biology.

ADVANCED BIOCHEMICAL RESEARCH

(Biological Sciences 536B)

Spring. Credit two hours. Prerequisite, Biological Sciences 536A. Graduate majors in biochemistry only. Hours to be arranged. Professor Racker and staff.

Research work in the laboratory of staff members on a rotating basis.

ADVANCED BIOCHEMISTRY, LECTURES*

(Biological Sciences 537)

Fall. Credit one to three hours. Students may take one or more sections of the course, as each section can be taken without attending a preceding section. Prerequisites, Biological Sciences 531 and 532. Lectures, T Th 9:05. Savage 100.

- (a) Professor D. Zilversmit: biochemistry of membranes; nine lectures and reading assignments for term paper.
- (b) Professor D. McCormick: mechanism of coenzyme function.
- (c) Professor Q. Gibson: mechanism of enzyme action; nine lectures and reading assignments for term paper.

ADVANCED BIOCHEMISTRY, LECTURES*

(Biological Sciences 538)

Spring. Credit one to three hours. Students may take one or more sections of the course, as each section can be taken without attending a preceding section. Prerequisites, Biological Sciences 531 and 532 or permission of instructor. Lectures, T Th 9:05. Savage 100.

- (a) Professor L. Heppel: nucleic acids; nine lectures and reading assignments for term paper.
- (b) Assistant Professor D. Wilson: protein synthesis; nine lectures and reading assignments for term paper.
- (c) Assistant Professor S. Edelstein: structure and function of proteins; nine lectures and reading assignments for term paper.

[FOOD BIOCHEMISTRY]

(Food Science 410)

Fall. Credit three hours. Prerequisite, Biological Sciences 431. Lectures, M W F 9:05. Stocking 120. Assistant Professor Kinsella. Given in even numbered years. Not offered in 1969.

This course emphasizes the chemical nature of foods and explains the multitude of chemical reactions occurring in foods in terms of reaction mechanisms, parameters governing these reactions and possible methods for their manipulation and/or control.

Seminars

RESEARCH SEMINAR IN BIOCHEMISTRY

(Biological Sciences 631-632)

Fall and spring. Credit one hour per term. M 8-9:30 P.M. Savage 100. Professor Racker.

38 CHEMISTRY AND PHYSICS

Required of all graduate students majoring in biochemistry. The course may be repeated for credit.

GRADUATE SEMINAR IN BIOCHEMISTRY

(Biological Sciences 633)

Spring. Credit one hour. Prerequisites, Biological Sciences 531 and 532. Hours to be arranged. Savage 130.

Topics to be announced.

GRADUATE SEMINAR IN BIOCHEMISTRY

(Biological Sciences 634)

Spring. Credit one hour. Prerequisites, Biological Sciences 531 and 532. Hours to be arranged. Savage 130.

Topics to be announced.

BIOCHEMISTRY SEMINAR

(Biological Sciences 639)

Fall and spring. No credit. F 4:15 Riley-Robb 125. Staff.

Lectures on current research in biochemistry presented by distinguished visitors and staff.

NUTRITION SEMINAR

(School of Nutrition 292)

Spring. Credit one hour. M 4:30. Registration by permission. Savage 100. Professor Barnes and faculty.

CHEMISTRY AND PHYSICS

INTRODUCTORY QUANTITATIVE ANALYSIS

(Chemistry 236)

Fall and spring. Credit four hours. Prerequisite, Chemistry 108 or advanced placement in chemistry. Enrollment is limited. Lectures, T Th 12:20. Laboratory: fall term, M W or T Th 1:25-4:25; spring term, M W or T Th 1:25-4:25, or F 1:25-4:25 and S 8-11, if warranted by sufficient registration. Preliminary examinations may be given in the evening. Professor Morrison and assistants.

A study of the fundamental principles of quantitative chemistry. Laboratory experiments are designed to illustrate basic principles and practice of quantitative procedures.

INTRODUCTORY PHYSICAL CHEMISTRY

(Chemistry 287-288)

Throughout the year. Credit three hours a term. Prerequisites, Chemistry 108 or 116 and Mathematics 111-112 or consent of the instructor. Chemistry 287 is prerequisite to 288. Lectures, M W F 9:05. Preliminary examinations may be given in the evening. Professor Albrecht and assistants.

A systematic treatment of the fundamental principles of physical chemistry.

INTRODUCTORY ORGANIC CHEMISTRY

(Chemistry 357-358)

Throughout the year. Credit three hours a term. Prerequisite, Chemistry 108 or 116, or advanced placement in chemistry. Chemistry 357 is prerequisite to Chemistry 358. Parallel registration in Chemistry 355-356 is recommended.

Lectures, M W F 9:05. Scheduled preliminary examinations may be held in the evening. Professor Miller.

A systematic study of the more important classes of carbon compounds, reactions of their functional groups, methods of synthesis, relations, and uses.

CHEMISTRY OF NATURAL PRODUCTS

(Chemistry 574)

Fall. Credit three hours. Prerequisites, Chemistry 456 or 457, and 465-466.

Lectures, T Th 12:20, and discussion period M 4:30. Professor Muxfeldt.

Particular attention will be devoted to methods of structure determination and synthesis as applied to selected terpenes, steroids, alkaloids, and antibiotics.

PHYSICAL CHEMISTRY OF PROTEINS

(Chemistry 586)

Spring. Credit four hours. Prerequisites, Chemistry 288 or 390. Lectures, M W F 8 and S 10:10; occasional lectures W 7:30 P.M. Professor Scheraga.

Chemical constitution, molecular weight, and structural basis of proteins; thermodynamic, hydrodynamic, optical, and electrical properties; protein and enzyme reactions; statistical mechanics of helixcoil transition in biopolymers; conformation of biopolymers.

GENERAL PHYSICS

(Physics 101-102)

Throughout the year. Credit four hours a term. Prerequisite, three years of college preparatory mathematics. Physics 101 (or 207) is prerequisite to 102. Similar to but less analytically demanding than Physics 207-208. Students who plan to major in a physical or biological science should preferably elect Physics 207-208. (See also Physics 201-202). Demonstration lectures, M W 9:05 or 11:15. Two discussion hours per week and about ten two-hour laboratory periods (usually in alternate weeks) as assigned. Fall term, Professor Greisen, Assistant Professor Delvaille and staff. Spring term, Professor Greisen, Associate Professor Sievers and staff.

Basic principles of physics, treated quantitatively but without calculus. Topics include motion, dynamics, conservation laws, kinetic theory, gravitational and electromagnetic forces and fields, wave motion and light, relativity, atomic physics, structure of matter, and nuclear physics. Historical and philosophical allusions as time permits. At the level of *Fundamental Physics* (Second Edition) by Orear, and *Theory of Physics*, (1967) by Stevenson and Moore.

ECONOMICS

FOOD ECONOMICS†

(School of Nutrition 159)

Spring. Credit three hours. Lectures, M W F 11:15. Savage 130. Associate Professor Call.

Designed for students who are interested in any aspect of the food industry. Emphasis is placed on the economics of food production, processing, marketing, and consumption. Attention is given to both United States and international food problems in a systematic treatment of economic principles applicable to the food sector of any economy.

MARKETING

(Agricultural Economics 240)

Fall or spring. Credit three hours. Lectures, M W F 11:15; one discussion period only, during the first week of the term, M T W Th or F 2:30-4:25 or S 9:05-11. Warren 45. Professor Darrah.

A study of how food products are marketed. Special attention is given to the consumption of food products, factors that affect consumption, market channels, operation of different marketing agencies, storage, transportation, packaging, product identification, advertising and promotion, buying, selling, and costs.

ECONOMICS OF AGRICULTURAL DEVELOPMENT

(Agricultural Economics 364)

Spring. Credit three hours. Prerequisite, Agricultural Economics 150, Economics 103-104, or consent of the instructor. Lectures, T Th S 9:05. Warren 345. Professor Mellor.

A discussion of the special problems of agricultural development in low per capita income areas and countries. Attention will be devoted to the relationship between development in agriculture and in other sectors of the economy, capital and capital formation, the role of land and land reform, increasing efficiency in resource use, coordination problems in agricultural development, and the like.

SURVEY OF INDUSTRIAL AND LABOR RELATIONS

(Industrial and Labor Relations 250)

Fall or spring. Credit three hours. Ives Hall. Professors Doherty, MacIntyre, and Tolles.

A survey for students in other divisions of the University. An analysis of the major problems in industrial and labor relations: labor union history, organization, and operation; labor market analysis and employment practices; industrial and labor legislation, and social security; personnel management and human relations in industry; collective bargaining; mediation and arbitration; the rights and responsibilities of employers and employees; the major governmental agencies concerned with industrial and labor relations.

ORGANIZATION AND MANAGEMENT

(Institution Management 425)

Fall. Credit two hours. Prerequisites, Institutional Management 241 or Hotel Accounting 81, and Institution Management 327. Lectures T Th 9:05. Assistant Professor Breunig.

Techniques of organizing and managing dietary departments in hospitals, schools, nursing homes, and similar institutions. Budgets, records, reports, and development of line and staff organization charts are included.

FOOD SCIENCE

[DAIRY AND FOOD ENGINEERING]†

(Food Science 302)

Fall. Credit four hours. Prerequisites, Physics 101 and 102 or the equivalent and Food Science 100. Lectures, M W F 10:10. Laboratory, M 2-4:25. Stocking 119. Professor Jordan. Offered in alternate years. Not offered in 1969.

Engineering aspects of dairy and food plant operations.

[CONCENTRATED, DEHYDRATED AND FROZEN FOODS]

(Food Science 311)

Spring. Credit four hours. Lectures, M W 11:15-1:00. Laboratory, M 1:40-4:30. Stocking 120. Professor Jordan and Associate Professor Potter. Given in alternate years. Not offered in 1970.

Deals with the principles and practices of condensing, drying, and freezing food materials. Such aspects as raw material selection, preparation, processing unit operations, packaging, and storage properties of foods will be considered in the light of current processing methods, and as related to the chemistry, microbiology, and technology of the ingredients and final products.

[STERILIZATION PROCESSES]

(Food Science 313)

Spring. Credit three hours. Prerequisites, Chemistry 353 or equivalent, Biological Sciences 394, and Physics 102. Recommended, a course in calculus and a course in biochemistry. Lectures, M W 10:10. Discussion, F 10:10. Riley-Robb 225. Laboratory, W 2-4:25. Riley-Robb 44. Associate Professor Buck. Given in alternate years. Not offered in 1970.

The principles of food preservation and the fundamentals of food processing from raw materials to finished product. Heat transfer, unit operations and unit processes employed by the canning industry will be emphasized, and sterilization by any means such as heat, chemicals, physical destruction, and filtration will be demonstrated. The effects of lethal energy treatment of biological fluids and systems on desirable components such as nutritive factors and flavor components will be considered along with the cost of operation. The laboratory involves actual participation in plant operations in the processing and preservation of various food products, and field trips.

FOOD FROM FERMENTATIONS†

(Food Science 401)

Fall. Credit five hours. Prerequisite, beginning courses in microbiology and organic chemistry or biochemistry are recommended. Lectures and laboratories, T Th 11:15-4:25. Professor Kosikowski and Assistant Professor Ledford. Given in alternate years. Offered in 1969.

The chemistry, microbiology, and technology of processes leading to important foods as cultured milks, cheeses, wines and beers. Consideration is given also to other fermentations resulting in high-protein foods from plant and animal sources, including those from petroleum and whey.

Line-flow processing and testing practices designed to acquaint students with the principles of fermentations and production of the above foods are carried out in the laboratory.

[CHEMISTRY OF MILK]†

(Food Science 404)

Fall. Credit three hours. Prerequisites, qualitative and quantitative analysis and organic chemistry. Stocking 120. Assistant Professor Ledford. Offered in alternate years. Not offered in 1969.

A study of milk constituents and physical properties. Deals with milk enzymes, lactose, milk fat, milk proteins, and minor constituents.

[FOOD BIOCHEMISTRY]

(Food Science 410)

Fall. Credit three hours. Prerequisite, Biological Sciences 431. Lectures, M W F 9:05. Stocking 120. Assistant Professor Kinsella. Given in even numbered years. Not offered in 1969.

This course emphasizes the chemical nature of foods and explains the multitude of chemical reactions occurring in foods in terms of reaction mechanisms, parameters governing these reactions and possible methods for their manipulation and/or control.

[ANALYTICAL METHODS]†

(Food Science 413)

Spring. Credit four hours. Prerequisites, Food Science 210, one term of either organic chemistry or biochemistry. Lectures, T Th 11:15, Stocking 119. Laboratory, Th 1:25-4:55, Stocking 209. Assistant Professor Sherbon. Offered in alternate years. Not offered in 1970.

A study of the analytical methods important to the food industry. The emphasis is on understanding the basic analytical chemistry applied in the various tests. General topics include sampling, gravimetric and volumetric methods, optical methods, electrochemistry, and the use of basic statistics.

INSTRUMENTAL METHODS

(Food Science 512)

Spring. Credit five hours. Prerequisite, Food Science 413 or permission of the instructor. Lectures, M W F 11:15, Stocking 120. Laboratory, M or T 1:25-4:55, Stocking 209. Assistant Professor Sherbon. Given in alternate years. Offered in 1970.

Deals with instrumental methods widely used in research and industry. The major emphasis is on chromatography, spectroscopy, electrophoresis, ultracentrifugation, thermal analysis, and the use of computers. The stress will be on the practical use of the material presented.

SEMINAR

(Food Science 600)

Fall and spring. Credit one hour.

SCIENCE OF FOOD†

(Food and Nutrition 446)

Fall. Credit three hours (lectures only) or four hours (with laboratory). Prerequisites, Food and Nutrition 246 or equivalent. Students who have had limited laboratory experience in comparative foods should register for four hours. Lectures, T Th S 9:05. Van Rensselaer NG-35. For students registered for four credit hours, laboratory T 2-4:25. Van Rensselaer 358. Professor Hester, Assistant Professor Pichel, Associate Professor Armbruster.

Scientific principles underlying modern food theory and practice. The relation to food quality of (a) the physical and chemical properties of proteins, lipids, carbohydrates, leavening agents and pigments; (b) stability of colloidal systems; (c) chemical composition and physical structure of natural and processed foods. Laboratory experiments designed to illustrate the effect of varying ingredients and treatments on the quality characteristics of food products.

SCIENCE OF FOOD, LABORATORY†

(Food and Nutrition 447)

Fall. Credit one hour. Prerequisite or parallel, Food and Nutrition 446. Laboratory, Th 1:25-4:25. Associate Professor Armbruster.

Laboratory experiments designed to illustrate (a) the physiochemical behavior of colloidal systems; (b) chemical reactions of some food components; (c) effects of temperature, pH, moisture, inorganic salts and enzymes on physiochemical changes in natural foods, food components, and food mixtures.

EXPERIMENTAL FOOD METHODS†

(Food and Nutrition 456)

Spring. Credit three hours. Prerequisite, Food and Nutrition 446. A course in statistics and Food and Nutrition 447 are desirable but not required. Laboratory, M W 1:25-4:25. Van Rensselaer 358. Associate Professor Armbruster.

Application of the scientific method to the design and performance of experimental food problems and to the interpretation and evaluation of results. Independent laboratory problems.

SPECIAL PROBLEMS FOR GRADUATE STUDENTS†

(Food and Nutrition 500)

Fall and spring. Credit to be arranged. Department faculty.

For students recommended by their chairmen and approved by the instructor in charge for independent, advanced work. Experience in research laboratories in the Department may be arranged.

READINGS IN FOOD†

(Food and Nutrition 516)

Fall. Credit two hours. Prerequisite, Food and Nutrition 446 or equivalent. Time and place to be arranged. Professor Schoch and Assistant Professor Pichel.

Critical review of selected topics in the current literature. Emphasis on experimental data and basic scientific principles underlying modern theory and practice relative to food quality. Topics are changed each term so that the courses may be repeated for credit.

SEMINAR IN FOOD AND NUTRITION

(Food and Nutrition 605)

Fall and spring. Credit one hour each semester. T 4:30. Van Rensselaer NG-35. Department faculty.

SANITARY ASPECTS OF MENU ITEM PREPARATION IN QUANTITY
(Institution Management 529)

Spring. Credit two hours. Graduate section of Institution Management 329. Instructor's signature required for preregistration. Lectures, T Th 11:15. Additional conferences to be arranged. Van Rensselaer. Assistant Professor Breunig.

Topics will include sources of food contamination, holding conditions as they affect bacterial multiplication and principles of sanitary handling and holding of ingredients and menu items, as they apply to hospital and school food services. Emphasis will be placed on the presentation of recent research data.

[POULTRY MEAT AND EGG TECHNOLOGY]†

(Poultry Science 450)

Spring. Credit three hours. Prerequisite, Chemistry 355 or its equivalent, and Biological Sciences 290. Lectures, T Th 9:05. Laboratory to be arranged. Rice 101. Professor Baker. Given in alternate years. Not offered in 1970.

A discussion and study of some of the important microbial and non-microbial changes in poultry meat and eggs as well as the chemical composition and preservation of these products. Development of new products is also emphasized.

POSTHARVEST PHYSIOLOGY, HANDLING, AND STORAGE OF FRUITS†

(Pomology 201)

Fall. Credit three hours. Prerequisite, Pomology 101 or 102. Lectures, T Th 8:00, Plant Science 143. Laboratory, F 2-4:25, Plant Science 114. Professor Smock.

The chemistry and physiology of fruits as they affect quality and marketability are studied. Handling methods, maturity indices, and storage practices are considered. Practical work involves grading and inspection of fruits and storage of fruit in different ways. One Saturday field trip is required.

VEGETABLE CROPS PHYSIOLOGY

(Vegetable Crops 401)

Fall. Credit four hours. Prerequisites, Vegetable Crops 211 and Biological Sciences 240 or their equivalent. Lectures, M W F 11:15, East Roberts 222. Laboratory, M 2-4:25. Professor Kelly.

The physiological bases of cultural practice and the application of these principles to problems in vegetable production. Original literature is used to illustrate the principles involved. Experimental material is studied in the laboratory to amplify lecture topics. Subjects discussed include: mineral nutrition as influenced by fertilization programs and crop sequence; nutrient interactions and induced deficiencies; growth and development; flowering; fruit setting; growth correlation; senescence; sex expression; photoperiodism; vernalization; and environmental factors affecting growth.

HANDLING AND MARKETING VEGETABLES, ADVANCED COURSE†

(Vegetable Crops 412)

Fall. Credit four hours. Lectures, T Th 11:15, East Roberts 222. Laboratory T or W 2-4:25, East Roberts 223. One-hour conference to be arranged. Professor Hartman.

Has the same lecture, laboratories, and field trips as Vegetable Crops 212. Much more outside reading of research and trade publications in the area covered is required in Vegetable Crops 412 than in Vegetable Crops 212. Also different examinations are given for the two courses.

[RESEARCH METHODS IN VEGETABLE CROPS]

(Vegetable Crops 501)

Spring. Credit three hours. Prerequisite, Vegetable Crops 401. It is recommended that Plant Breeding 510 and 511 precede or accompany this course. Lectures, M W F 9:05. East Roberts 223. Professor Kelly. Offered in alternate years. Not offered in 1970.

A study of research techniques peculiar to vegetable crops.

MATHEMATICS**CALCULUS**

(Mathematics 111)

Either term. Credit three hours. Prerequisite, three years of high school mathematics, including trigonometry. Fall term: lectures, M W 11:15, 12:20, plus one hour to be arranged. Spring term: M W F 8, 9:05, 10:10; T Th S 8, 11:15, 12:20.

Plane analytical geometry, differentiation and integration of algebraic and trigonometric functions, applications.

CALCULUS

(Mathematics 112)

Either term. Credit three hours. Prerequisite, Mathematics 111. Fall term: lectures, M W F 9:05, 10:10; T Th S 9:05, 10:10; Spring term: lectures, M W 11:15, 12:20 plus one hour to be arranged.

Differentiation and integration of elementary transcendental functions, the technique of integration, conic sections, polar coordinates, infinite series.

STATISTICAL METHODS I

(Statistics and Biometry 510)

Fall. Credit four hours. Prerequisite, graduate standing or permission of instructor. Lectures, T Th S 10:10. Plant Science 233. Laboratory to be arranged. Examinations will be held at 7:30 P.M. on Thursday evenings. Assistant Professor Urquhart.

The distributions of statistics encountered in biological and other fields are considered from the point of view of elementary probability notions and by sampling from known population. The results, with principles of experimentation, are applied to the conduct of experiments and interpretation of results. Topics include point and interval estimation, tests of hypotheses and of significance, the treatment of discrete data, methods involving rank sum procedures, the consideration of normal populations, the one-way analysis of variance and simple linear regression. Emphasis is placed on basic statistical principles, criteria for selection of statistical techniques and the application of these techniques to a wide variety of biological situations.

STATISTICAL METHODS II

(Statistics and Biometry 511)

Spring. Credit four hours. Prerequisite, Course 510 or the equivalent. T Th S 10:10. Warren 231. Laboratory to be arranged. Examinations will be held at 7:30 P.M. on Thursday evenings. Assistant Professor Urquhart.

The work of Course 510 is continued. Topics include multiple and curvilinear regression, complex analyses of variance and covariance. The analysis of variance discussion considers treatment designs, single degree of freedom contrasts, the simpler experimental designs, sampling errors, fixed, mixed, and random models, and the effect of disproportionate numbers. When appropriate, the computer is considered as the reasonable way to have calculations done.

ECONOMIC AND SOCIAL STATISTICS

(Industrial and Labor Relations 510)

Fall and spring. Credit three hours. Lectures, T Th 1:25-2:30, Ives 117. Laboratory, Th 8-9:55 or F 2:30-4:25, Ives 115. Professor Francis.

A nonmathematical course for graduate students in the social studies without previous training in statistical method. Emphasis will be placed on discussion of technical aspects of statistical analysis and on initiative in selecting and applying statistical methods to research problems. The subjects ordinarily covered will include analysis of frequency distributions, regression and correlation analysis, and selected topics from the area of statistical interference.

MICROBIOLOGY**GENERAL MICROBIOLOGY**

(Biological Sciences 290)

Fall or spring. Credit five hours. Prerequisites, Biological Sciences 101-102 or 103-104 and Chemistry 104 or 108 or the equivalent. Lectures, M W F 11:15,

46 MICROBIOLOGY

Stocking 218. Laboratory, M W 2-4:25; T Th 8-11 or 2-4:25, Stocking 301, except spring term, M W section in Stocking 321. Fall term, Professor H. W. Seeley; spring term, Professor VanDemark.

A study of the basic principles and relationships in the field of microbiology, with fundamentals necessary to further work in the subject. The course offering in the spring term will provide special emphasis on the application of microbiology to home economics and agriculture.

GENERAL MICROBIOLOGY, LECTURES

(Biological Sciences 290A)

Fall or spring. Credit three hours. Prerequisites, Course 101-102 or 103-104 and Chemistry 104 or 108 or the equivalent. Lectures, M W F 11:15. Stocking 218. Fall term, Professor H. W. Seeley; spring term, Professor VanDemark.

The same as the lecture part of Course 290. Will not serve alone as a prerequisite for advanced microbiology courses.

GENERAL MICROBIOLOGY, LABORATORY

(Biological Sciences 290B)

Fall or spring. Credit two hours. May be taken only by special permission of the instructor. Fall term, Professor H. W. Seeley; spring term, Professor VanDemark.

The same as the laboratory part of Course 290.

ADVANCED BACTERIOLOGY, LECTURES

(Biological Sciences 390A)

Fall. Credit three hours. Prerequisites, organic chemistry, Course 290 or permission of the instructor. Biochemistry is desirable and may be taken concurrently. Lectures, T Th S 9:05. Stocking 119. Associate Professor MacDonald.

A study of the comparative physiological and ecological relationships among bacteria and some related organisms. A number of groups of bacteria will be discussed in detail as well as factors which influence their ability to survive in nature. In addition, a number of lectures will be devoted to the history of bacteriology and to the theory and development of bacterial classification.

ADVANCED BACTERIOLOGY, LABORATORY

(Biological Sciences 390B)

Fall. Credit three hours. Prerequisites, concurrent registration in 390A and permission of the instructor. Laboratory-lecture, M 1:25. Other hours to be arranged. Stocking 321. Associate Professor MacDonald.

Techniques for the isolation, cultivation, and detailed study of selected groups of organisms. Some of the more standard techniques of physiological study will be introduced.

APPLIED AND INDUSTRIAL MICROBIOLOGY

(Biological Sciences 393)

Fall. Credit three hours. Prerequisite, Course 290 or the equivalent. Lectures, T Th S 11:15. Stocking 119. Professors Delwiche, H. W. Seeley, VanDemark. Given in alternate years. Offered in 1969.

A survey of the microbiology of industrial fermentations, water and waste decomposition.

DAIRY AND FOOD MICROBIOLOGY

(Biological Sciences 394)

Spring. Credit four hours. Prerequisite, Course 290. Lectures, M W 12:20, Stocking 119. Laboratory, M W 2-4:25, Stocking 301. Professor Naylor.

The major families of microorganisms of importance in dairy and food

science are studied systematically with emphasis on the role played by these organisms in food preservation, food fermentation, and public health. The laboratory work includes practice in the use of general and special methods for microbiological testing and control of dairy and food products, as well as practice in the isolation and characterization of organisms found in foods.

MICROBIAL PHYSIOLOGY LECTURE

(Biological Sciences 490A)

Spring. Credit three hours. Prerequisite, Biological Sciences 390 or permission of instructor. Lectures, T Th S 10:10. Stocking 119. Primarily for microbiology majors intending to enter graduate school and for graduate students. Assistant Professor Gibson and staff.

A study of the organization of physiological processes in microorganisms, including a study of structure, energy-yielding mechanisms, macromolecular biosynthesis and of growth and regulation.

MICROBIAL PHYSIOLOGY LABORATORY

(Biological Sciences 490B)

Spring. Credit three hours. Prerequisites, a grade of B— or better in Biological Sciences 390, coregistration in 490A and permission of the instructor. Time to be arranged. Stocking 321. Assistant Professor Gibson and staff.

Experiments on material covered in Course 490A will be used to introduce students to modern techniques used in physiological research, such as the use of radioisotopes, large-scale growth of microorganisms, and the isolation and characterization of specific cellular components.

MICROBIAL GENETICS

(Biological Sciences 495)

Fall. Credit four hours. Prerequisites, Biological Sciences 281 and 290 or permission of the instructor. For upperclassmen and graduate students. Lecture, W 7:30–9:25 P.M., Stocking 218. Laboratory, T 1:25–4:25 and other hours to be arranged, Stocking 321. Associate Professor Zahler.

Genetics of bacteria and their viruses, with emphasis on the mechanisms of genetic phenomena.

MICROBIAL GENETICS, LECTURES

(Biological Sciences 495A)

Fall. Credit two hours. Prerequisites, Biological Sciences 281 and 290 or 290A. For upperclassmen and graduate students. Lecture, W 7:30–9:25 P.M. Stocking 218. Associate Professor Zahler.

The course is the same as the lecture portion of Biological Sciences 495.

CHEMISTRY OF MICROBIAL PROCESSES

(Biological Sciences 496)

Spring. Credit two hours. Prerequisites, beginning courses in general microbiology, biochemistry, and organic chemistry. Course intended for upperclassmen and graduate students. Lectures, M W 11:15. Stocking 119. Professor Delwiche.

Selected topics pertaining to the energy metabolism, oxidative and fermentative abilities, and biosynthetic capacities of microorganisms. Where possible and appropriate the subject matter deals with the various microbial forms in a comparative sense.

PATHOLOGY

PATHOLOGY OF NUTRITIONAL DISEASES*

(Veterinary Pathology 931)

Spring. Credit three hours. Prerequisites, Pathology 630 and 631. Lecture and laboratory hours to be arranged. Designed primarily for graduate students of nutrition. Professor Krook.

PHYSICAL BIOLOGY

RADIOISOTOPES IN BIOLOGICAL RESEARCH: PRINCIPLES AND PRACTICE

(Veterinary Physical Biology 921)

Spring. Credit four hours. Lectures, T Th 11:05. Laboratory M T or W 1:30-5. Prerequisites, a course in quantitative chemistry and permission of instructor. Professor Comar and staff.

Lectures, demonstrations, and laboratory on the fundamentals of atomic energy procedures and applications to biological research.

BIOLOGICAL EFFECTS OF RADIATION

(Veterinary Physical Biology 922)

Fall. Credit two hours. Lectures, T Th 10:10. Laboratory, Th 1:30-4:25. Assistant Professor Casarett.

Lectures and demonstrations on radiation physics, radiation chemistry, radiation effects at the cellular level, radiation effects in multicellular organisms, genetic effects of radiation, and radioprotective and radiomimetic substances.

BIOLOGICAL MEMBRANES AND NUTRIENT TRANSFER

(Veterinary Physical Biology 923)

Spring. Credit two hours. Prerequisites, animal or plant physiology, quantitative and organic chemistry, physics, and consent of instructor. Cellular physiology and elementary physical chemistry desirable. Time and place to be arranged. Professor Wasserman.

An introduction to elementary biophysical properties of biological membranes, theoretical aspects of permeability and transport, and mechanism of transfer of inorganic and organic substances across intestine, placenta, kidney, erythrocytes, bacteria, and other biological systems.

PHYSIOLOGY

HISTOLOGY: THE BIOLOGY OF THE TISSUES

(Biological Sciences 313)

Fall. Credit four hours. Prerequisites, a two-semester introductory biology sequence; comparative anatomy and organic chemistry or biochemistry desirable. Lectures, T Th 11:15, Stimson G-1. Laboratory, T Th 8-9:55, or 2:30-4:25, Stimson 206. Staff.

A general course dealing with the biology of the tissues to provide the student with a basis for understanding the microscopic and fine structural

organization of vertebrates and the methods of analytic morphology at the cell and tissue levels. The dynamic interrelations of structure, chemical composition, and function in cells and tissues are stressed.

[SPECIAL HISTOLOGY: THE BIOLOGY OF THE ORGANS]

(Biological Sciences 412)

Spring. Credit four hours. Prerequisites, Biological Sciences 313, or consent of instructor. Enrollment limited to 18 students. Lectures, W F 9:05, Stimson 105. Laboratory, W F 2-4:25, Stimson 206. Staff. Given in alternate years. Not offered in 1970.

A continuation of Biological Sciences 313. The microscopic and ultrastructural organization of the principal vertebrate organ systems are studied in relation to their development, functional interaction, and special physiological roles. Biological Sciences 313 and 412 together present the fundamental aspects of the microscopic and submicroscopic organization of the vertebrate body from a physiological perspective. The organization of the course involves student participation in "lecture-seminars" and the prosecution of independent project work supplementary to the regular work of the laboratory. The latter enables students to gain practical experience with histological and histochemical preparative techniques.

GENERAL ANIMAL PHYSIOLOGY, LECTURES

(Biological Sciences 410)

Fall. Credit three hours. Prerequisites, one year of biology and courses in chemistry, organic chemistry, physics, and biochemistry desirable. Lectures, M W F 10:10. Stimson G-25. Professor Howland.

The principles of animal physiology are developed through consideration of the functioning of cells, tissues and organs. Specific topics discussed include respiration, metabolism, circulation, excretion, chemical integration, muscle contraction, nerve action, and sensory reception.

GENERAL ANIMAL PHYSIOLOGY, LABORATORY

(Biological Sciences 410A)

Fall. Credit one hour. Prerequisites, Biological Sciences 413 or equivalent must be taken concurrently. Lecture W 2:30, alternate weeks only, Stimson G-25. Laboratory, T 8-11 or M T Th or F 1:25-4:25, alternate weeks, Stimson 316. Professor Howland.

Students are introduced to basic techniques utilized in the study of the physiology of animal tissues. Experiments cover topics dealing with respiration, properties of muscle, circulation, activity of nerves, and osmotic phenomena.

MAMMALIAN PHYSIOLOGY

(Biological Sciences 414)

Spring. Credit six hours. Registration by permission. Prerequisite, a year of biological sciences. Courses in biochemistry, histology, and gross anatomy desirable. Lectures, M W F 8, Morrison 167. Discussion, S 10:10, Morrison 167. Laboratory, M or W 1:25, Morrison 174. Professors Gasteiger, Hansel and Visek (in charge), and Associate Professor Bensadoun.

A general course in mammalian physiology including circulation, respiration, digestion, metabolism, renal function, endocrinology, and the nervous system.

EXPERIMENTAL ENDOCRINOLOGY

(Biological Sciences 513)

Fall. Credit two or three hours. Primarily for graduate students, open to undergraduates for two credits. Prerequisites, a year of zoology or its equivalent, organic chemistry, physiology, and consent of instructor. Lectures, M F 11:15, Stimson G-1. Laboratory, M or F 2-4:25, Stimson 306. Professor Leonard.

Lectures on the anatomy and physiology of the vertebrate endocrine glands, glandular interrelationships, mechanisms of hormone action, chemical and physiological properties of the hormones, assay methods. Laboratory includes small animal surgery, microtechnique, illustrative experiments on the effects of hormones.

FUNDAMENTALS OF ENDOCRINOLOGY

(Animal Science 427)

Fall. Credit four hours. Prerequisite, a course in human or veterinary physiology, or by permission. Lectures, T Th S 10:10. Morrison 167. Laboratory to be arranged. Professor Hansel.

A general course in the physiology of the endocrine glands, and the roles played by each hormone in the regulation of normal body processes. The laboratory work consists of a series of projects designed to illustrate the basic principles of endocrinology and their applications to more efficient production in all classes of livestock.

PHYSIOLOGY

(Veterinary Physiology 917)

Spring. Credit three hours. Prerequisites, Physiology 510, Anatomy 501 and 502, or Anatomy 900 or Biological Sciences 311 and 433. Lectures, T Th F 8. Professors Bergman, Sellers, Stevens; Associate Professors Dobson and Nan-geroni.

Lectures and demonstrations on cellular physiology, muscle, nervous system, digestive system, urine secretion, blood, and lymph.

PHYSIOLOGY

(Veterinary Physiology 918)

Fall. Credit three hours. Prerequisite, Veterinary Physiology 511. Lectures, T Th F 8. Professors Bergman and Sellers.

Lectures and demonstrations on circulation, respiration, endocrine organs, temperature regulation, and reproduction.

SOCIAL STUDIES

COMMUNITY AND REGIONAL DEVELOPMENT AND PLANNED CHANGE

(Rural Sociology 411)

Spring. Credit three hours. Lectures, M W F 10:10. Warren 37. Professor Capener.

A consideration of the problems involved in helping people and organizations in a community work together to meet their common needs. There are two major emphases: (1) analysis of communities from the perspective of the community development worker as a change agent, (2) consideration of the problems which confront community development workers and the processes and methods by which they carry out their various community

development tasks. Projects in nearby communities provide field laboratory experiences.

RESEARCH DESIGN

(Rural Sociology 515)

Fall. Credit three hours. Open to graduate students only. Warren 232. Professor to be announced.

An introduction to the methods of social research. Course topics follow the major steps in the design and execution of sociological research from the definition of the problem and formulation of hypotheses to the interpretation of results and preparation of a final report. Practice exercises are assigned each week utilizing data from departmental projects.

CROSS-CULTURAL RESEARCH METHODS

(Rural Sociology 516)

Spring. Credit three hours. Prerequisite, Rural Sociology 515 or permission of the instructor. Lectures, W F 1:25-2:40. Warren 131. Mr. MacCannel.

Problems of comparative research using available data such as questionnaire surveys in data banks, institutionalized national social accounts, documents, ethnographic reports and aerial photographs. Special attention given to macro-analysis, trend studies, and rapid, low-cost research procedures.

APPLICATIONS OF SOCIOLOGY TO DEVELOPMENT PROGRAMS

(Rural Sociology 528)

Spring. Credit three hours. Open to graduate students only. Lectures, M W F 11:15-12:30. Warren 31. Professor Polson.

Application of sociological theory and methods to the problems of institutions and agencies concerned with rural development. Special emphasis is placed on programs for agricultural extension education and community development in low-income countries.

SOCIAL ANTHROPOLOGY

(Anthropology 301)¹

Fall. Credit four hours. Open to sophomores and upperclassmen who have not had Anthropology 101. Lectures, M W F 12:20. Professor Sharp.

A study and comparison of the types of learned, shared, and transmitted behavior patterns and ideas by means of which men of various periods and places have dealt with their environment, worked out their social relations with their fellow men, and defined their place in the cosmos. An inquiry into human nature and its expression in man's institutional and intellectual creations.

CULTURAL CHANGE

(Anthropology 313)¹

Fall. Credit four hours.

A study of various theories of cultural change and their relevance to the on-going social process; an analysis of such concepts as innovation, diffusion, and acculturation in relation to culture change theory; a consideration of factors involved in maintaining stability or stimulating change in nonindustrialized culture.

APPLIED ANTHROPOLOGY

(Anthropology 314)¹

Spring. Credit four hours. Professors Opler and Sharp. Offered in 1970.

¹ See the *Announcement of the College of Arts and Sciences* for additional offerings in this area.

52 SOCIAL STUDIES

The uses of anthropology in the modern world. Designed not only for students of the humanities and social sciences, but also for natural scientists concerned with the cultural problems involved in technological change, community development, native administration, and modernization in various regions of the world.

COMPARATIVE SOCIAL SYSTEMS

(Anthropology 423)¹

Fall. Credit four hours.

The topics dealt with will include the comparative study of systems of kinship, politics, religion, and magic in preliterate societies and the relationship between these types of systems in particular societies. They will further include age and sex differentiations; age-sets and age-grades; division of labor, types of specialization, occupational associations; rank and occupations; social classes, caste, slavery, pawnship and serfdom; secret associations; social networks and social mobility. References will also be made to theories concerning them.

ETHNOLOGY OF NORTH AMERICA

(Anthropology 430)¹

Spring. Credit four hours. Prerequisite, Anthropology 101 or 301 or consent of the instructor. Professor to be announced.

A general survey of the ethnography of North America, with emphasis on problems and topics to which the North American materials are most relevant. Selected cultures will be considered in some detail.

ETHNOLOGY OF MIDDLE AMERICA

(Anthropology 432)¹

Spring. Credit four hours. Lectures, T Th S 9:05. Associate Professor Cancian.

A survey of the social anthropology of the Indian and peasant populations of Mexico and Guatemala, with emphasis on peasant economies and social organization.

ETHNOLOGY OF MAINLAND SOUTHEAST ASIA

(Anthropology 434)¹

Spring. Credit four hours. Lectures, M W F 11:15. Professor Sharp.

The development and distribution of major cultural systems in mainland Southeast Asia. Discussion of selected groups in southern China, Assam, Burma, Thailand, Laos, Cambodia, and Vietnam, and of the fate of traditional cultural characteristics following the expansion of Chinese, Indian, Moslem, and Western civilizations into these areas.

ETHNOLOGY OF AFRICA

(Anthropology 436)¹

Spring. Credit four hours. Lectures, M W F 2:30. Professor Turner.

A social and cultural survey of representative African peoples. Stress is laid on the comparative study of political institutions and local descent groups. Ritual beliefs and practices are considered in relation to repetitive and radical change.

CULTURE AND SOCIETY IN SOUTH ASIA

(Anthropology 441)¹

Fall. Credit four hours. Lectures, T Th S 9:05. Professor Opler.

¹ See the *Announcement of the College of Arts and Sciences* for additional offerings in this area.

A survey of the social, economic, political, and religious institutions of the countries of South Asia. Both the traditional cultures and changes which are taking place are considered.

INTRODUCTION TO DEMOGRAPHY

(Sociology 530)

Spring. Credit four hours. Prerequisite, consent of the instructor. Lectures, M W F 10:10. Assistant Professor Marden.

A survey of the methods, theories, and problems of contemporary demography. Special attention is directed to the social determinants and consequences of fertility, mortality, and migration. The populations of both developed and developing areas are examined.

DEMOGRAPHIC THEORY

(Sociology 531)

Fall. Credit four hours. Lecture, T 1:25-3:20.

Deals with theory construction, hypothesis derivation, and the integration of theory and research in demography. Although emphasis is placed on contemporary theories, earlier formulations beginning with Malthus also are examined insofar as they deal with fertility, mortality, migration, and the people-resource question.

TECHNIQUES OF DEMOGRAPHIC ANALYSIS

(Sociology 535)

Fall. Credit four hours. Prerequisite, Sociology 230 or consent of the instructor. Lectures, T Th S 11:15.

Methods of processing and analyzing demographic data. Measures of mortality, fertility, and migration as applied to census and vital statistics data will be analyzed, and the more general applications of demographic techniques to other classes of data illustrated.

SOCIAL ORGANIZATION AND CHANGE

(Sociology 541)

Fall. Credit four hours. Lectures, T Th 1:25-3:20.

An analysis of major problems in theory and research in the general field of social organization and change. The subject will be studied from the standpoint of the nature and size of the social system (small groups, communities, large-scale organizations, societies) and also in terms of the social processes and properties of the system, such as integration, authority, conformity, and deviance.

RESEARCH

SPECIAL PROBLEM

(School of Nutrition 199)

Report of individual problem under the direction of any member of the faculty of the Graduate School of Nutrition. (See page 20 for details.)

SEMINARS

SEMINAR IN ANIMAL NUTRITION

(Animal Science 619)

Fall. Credit one hour. Open to graduate students with major or minor field

54 SEMINARS

of study in animal nutrition. Registration by permission. M 4:30. Morrison 348. Animal Nutrition staff.

A critical review of the literature and other topics of special interest to graduate students in animal nutrition.

DAIRY SCIENCE AND FOOD SCIENCE SEMINARS

(Biological Sciences 600)

Fall and spring. Time to be arranged. Stocking 124.

RESEARCH SEMINAR IN BIOCHEMISTRY

(Biological Sciences 631-632)

Fall and spring. Credit one hour per term. M 8-9:30 P.M. Savage 100. Professor Racker.

Required of all graduate students majoring in biochemistry. The course may be repeated for credit.

GRADUATE SEMINAR IN BIOCHEMISTRY

(Biological Sciences 633)

Fall. Credit one hour. Prerequisites, Biological Sciences 531 and 532. Hours to be arranged. Savage 130.

Topics to be announced.

GRADUATE SEMINAR IN BIOCHEMISTRY

(Biological Sciences 634)

Spring. Credit one hour. Prerequisites, Biological Sciences 531 and 532. Hours to be arranged. Savage 130.

Topics to be announced.

BIOCHEMISTRY SEMINAR

(Biological Sciences 639)

Fall and spring. No credit. F 4:15. Riley-Robb 125. Staff.

Lectures on current research in biochemistry presented by distinguished visitors and staff.

MICROBIOLOGY SEMINAR

(Biological Sciences 699)

Fall and spring. Without credit. Open to all who are interested. Th 4:15. Riley-Robb 105. Staff.

SEMINAR IN HEALTH RESEARCH

(Business and Public Administration 455)

Fall. Credit three hours. Malott Hall. Associate Professor White.

The primary objective is to increase the student's ability to evaluate research reports and other studies, to assess their relevance for the field, and to formulate his own problems in a manner conducive to scientific investigation. An examination is made of the contributions of the social sciences and other disciplines to an understanding of current problems in the health field and in hospital administration in particular.

SEMINAR IN HUMAN NUTRITION

(Food and Nutrition 515)

Fall and spring. Credit three hours. Lectures, M W F 9:05. One discussion period per week to be arranged. Assistant Professor Devine.

Designed for graduate students with limited work in Food and Nutrition.

The seminar utilizes the lecture and discussion of Food and Nutrition 112 as a basis for supplemental readings and critical review of research on selected nutritional problems.

SEMINAR IN FOOD AND NUTRITION

(Food and Nutrition 605)

Fall and spring. Credit one hour each semester. T 4:30. Van Rensselaer NG-35. Department faculty.

SEMINAR: INTERNATIONAL AGRICULTURAL DEVELOPMENT

(International Agriculture 600)

Fall and spring. No credit. Third and fourth Wednesdays 4:30. Emerson 135. Professor Turk and staff.

Primarily for graduate students interested in an integrated view of problems related to international agricultural development. Undergraduates with a specialization in International Agriculture are encouraged to attend without registering. The seminar will focus on developing an understanding of the nature and interrelatedness to agricultural development of the social sciences, plant and animal sciences, foods and nutrition, and natural resources.

NUTRITION SEMINAR

(School of Nutrition 292)

Spring. Credit one hour. M 4:30. Registration by permission. Savage 100. Professor Barnes and faculty.

PHYSICAL BIOLOGY GRADUATE SEMINAR

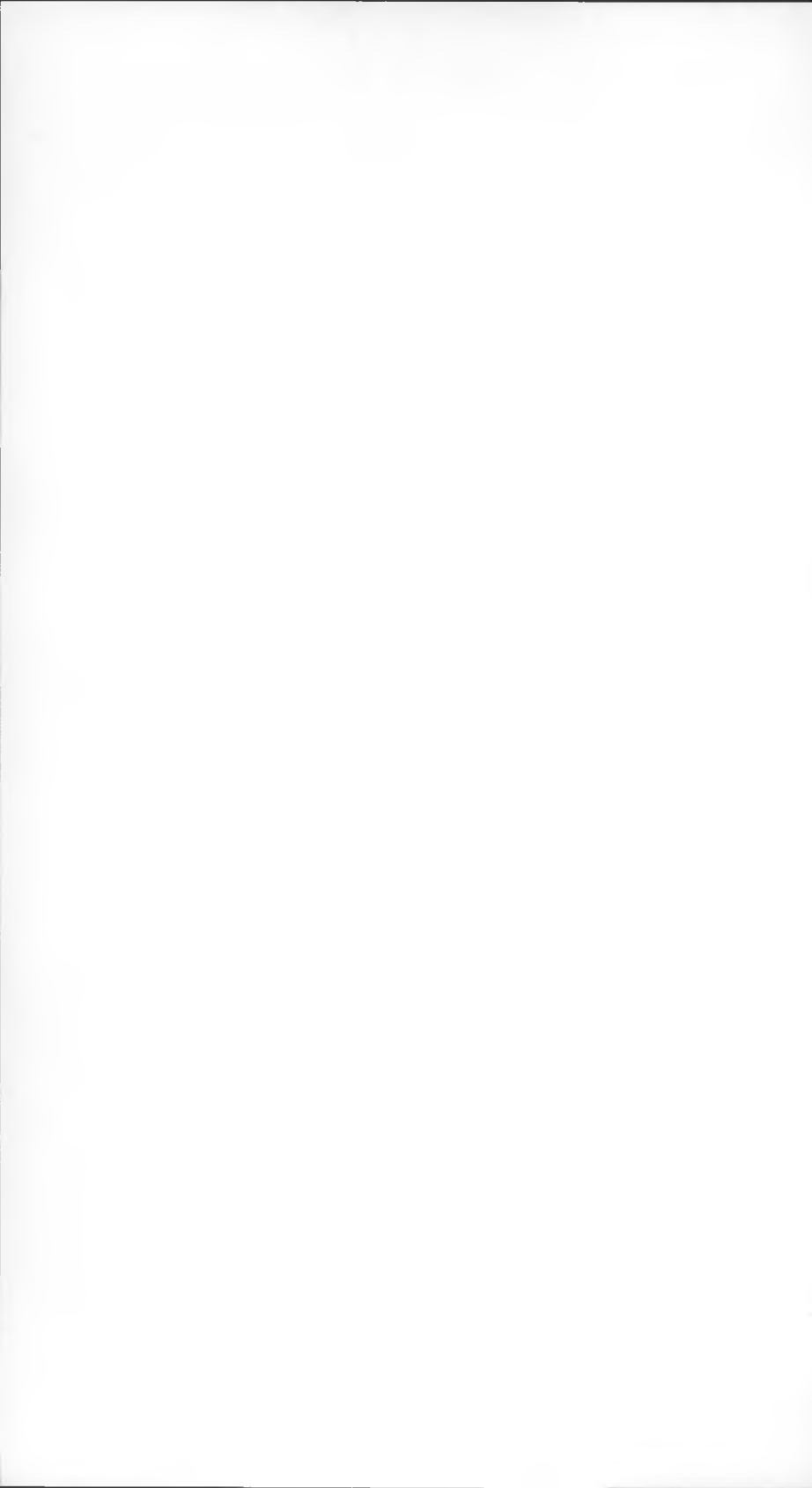
(Veterinary Physical Biology 926)

Fall and spring. Credit one hour. Professor Comar and staff.

SEMINAR

(Food Science 600)

Fall and spring. Credit one hour.



Index of Courses

All courses are arranged numerically under the department or division offering the course.

<i>Course Number</i>	<i>Title</i>	<i>Page</i>
AGRICULTURAL ECONOMICS		
240	Marketing	40
364	Economics of Agricultural Development	40
ANIMAL SCIENCE		
410	Principles of Animal Nutrition	30
427	Fundamentals of Endocrinology	50
503	Nutritional Energetics	27
510	Special Topics in Animal Nutrition	30
511	Laboratory Work in Animal Nutrition	30
619	Seminar in Animal Nutrition	35, 53
ANTHROPOLOGY		
301	Social Anthropology	51
313	Cultural Change	51
314	Applied Anthropology	51
423	Comparative Social Systems	52
430	Ethnology of North America	52
432	Ethnology of Middle America	52
434	Ethnology of Mainland Southeast Asia	52
436	Ethnology of Africa	52
441	Culture and Society in South Asia	52
BIOLOGICAL SCIENCES		
290	General Microbiology	45
290A	General Microbiology, Lectures	46
290B	General Microbiology, Laboratory	46
313	Histology: The Biology of the Tissues	48
390A	Advanced Bacteriology, Lectures	46
390B	Advanced Bacteriology, Laboratory	46
393	Applied and Industrial Microbiology	46
394	Dairy and Food Microbiology	46
410	General Animal Physiology, Lectures	49
410A	General Animal Physiology, Laboratory	49
412	Special Histology: The Biology of the Organs	49
414	Mammalian Physiology	49
431	Principles of Biochemistry, Lectures	36
432	Principles of Biochemistry, Laboratory	36
490A	Microbial Physiology Lecture	47
490B	Microbial Physiology Laboratory	47
495	Microbial Genetics	47
495A	Microbial Genetics, Lectures	47
496	Chemistry of Microbial Processes	47
513	Experimental Endocrinology	50
530	Biochemistry of the Vitamins	36

58 INDEX OF COURSES

531-532	General Biochemistry, Lectures	36
533	General Biochemistry, Laboratory	36
536A	Advanced Biochemical Methods, Laboratory	37
536B	Advanced Biochemical Research	37
537	Advanced Biochemistry, Lectures	37
538	Advanced Biochemistry, Lectures	37
600	Dairy Science and Food Science Seminars	54
631-632	Research Seminar in Biochemistry	37, 54
633	Graduate Seminar in Biochemistry	38, 54
634	Graduate Seminar in Biochemistry	38, 54
639	Biochemistry Seminar	38, 54
699	Microbiology Seminar	54

BUSINESS AND PUBLIC ADMINISTRATION

141	Introduction to Clinical Medicine	35
455	Seminar in Health Research	36, 54

CHEMISTRY

236	Introductory Quantitative Analysis	38
287-288	Introductory Physical Chemistry	38
357-358	Introductory Organic Chemistry	38
574	Chemistry of Natural Products	39
586	Physical Chemistry of Proteins	39

ENGINEERING

2532	Environmental Quality Engineering	35
------	---	----

FOOD AND NUTRITION

322	Maternal and Child Nutrition	28
332	Principles of Human Nutrition	28
441	Nutrition and Disease	28
442	Advanced Human Nutrition	28
446	Science of Food	42
447	Science of Food, Laboratory	42
456	Experimental Food Methods	43
500	Special Problems for Graduate Students	43
501	Proteins and Amino Acids	27
512	Nutrition and Growth	29
514	Readings in Nutrition	29
515	Seminar in Human Nutrition	30, 54
516	Readings in Food	43
524	Research Methods in Human Metabolic Studies	29
605	Seminar in Food and Nutrition	35, 43, 55

FOOD SCIENCE

302	Dairy and Food Engineering	40
311	Concentrated, Dehydrated and Frozen Foods	41
313	Sterilization Processes	41
401	Food from Fermentations	41
403	International Food Development	29
404	Chemistry of Milk	41
410	Food Biochemistry	37, 41
413	Analytical Methods	42
512	Instrumental Methods	42
600	Seminar	42, 55

INDUSTRIAL AND LABOR RELATIONS

250	Survey of Industrial and Labor Relations	40
510	Economic and Social Statistics	45

INSTITUTION MANAGEMENT

425	Organization and Management	40
529	Sanitary Aspects of Menu Item Preparation in Quantity	43

INTERNATIONAL AGRICULTURE

600	Seminar: International Agricultural Development	55
-----	---	----

MATHEMATICS

111	Calculus	44
112	Calculus	45

PHYSICS

101-102	General Physics	39
---------	-----------------------	----

POMOLOGY

201	Postharvest Physiology, Handling, and Storage of Fruits	44
-----	---	----

POULTRY SCIENCE

450	Poultry Meat and Egg Technology	43
502	Lipids and Carbohydrates	27
504	Minerals and Vitamins	28

RURAL SOCIOLOGY

411	Community and Regional Development and Planned Change	50
515	Research Design	51
516	Cross Cultural Research Methods	51
528	Applications of Sociology to Development Programs	51

SCHOOL OF NUTRITION

100	International Nutrition Problems, Policy and Programs	29
159	Food Economics	39
199	Special Problem	53
292	Nutrition Seminar	30, 38, 55
392	Clinical and Public Health Nutrition	30, 35
520	General Nutrition	28

SOCIOLOGY

530	Introduction to Demography	53
531	Demographic Theory	53
535	Techniques of Demographic Analysis	53
541	Social Organization and Change	53

STATISTICS AND BIOMETRY

510	Statistical Methods I	45
511	Statistical Methods II	45

VEGETABLE CROPS

401	Vegetable Crops Physiology	44
412	Handling and Marketing Vegetables, Advanced Course	44
501	Research Methods in Vegetable Crops	44

60 INDEX OF COURSES

VETERINARY PATHOLOGY

931	Pathology of Nutritional Diseases	48
-----	---	----

VETERINARY PHYSICAL BIOLOGY

921	Radioisotopes in Biological Research: Principles and Practice	48
922	Biological Effects of Radiation	48
923	Biological Membranes and Nutrient Transfer	48
926	Physical Biology Graduate Seminar	55

VETERINARY PHYSIOLOGY

917	Physiology	50
918	Physiology	50

General Index

- Academic requirements for,
 - admission, 14
 - graduation, 18
- Administration, 5
- Advisory service to Cornell
 - undergraduates, 24
- Animal science, 27, 30, 35, 50, 53
- Animal nutrition, 11, 30, 54
- Announcements, 63
- Anthropology, 51
- Applications, 17
- Assistantships, 23
- Bacteriology, see Microbiology
- Biochemistry, 18, 36, 54
 - nutritional, 11, 27
- Calendar, academic, 2
- Campus map, 32
- Chemistry, 38
- Course descriptions, 27
 - requirements, 18
- Clinical nutrition, 11, 30, 35
- Core faculty, 7
- Curriculum, 10, 18
- Degrees and curriculum, 10, 18
- Demography, 53
- Economics, food, 18, 39
- English proficiency requirement, 14
- Examinations, 20
 - grade requirement, 17
- Faculty, 5, 10, 18
- Fees and tuition, 22
- Field of Nutrition, 10
- Field of Food and Nutrition, 10
- Financial aid, 23
- Food, and nutrition, 27, 35, 42, 54
 - economics, 18, 39
 - science, 12, 19, 29, 37, 40, 55
- General fee, 22
- Graduation requirements, 17
- Health requirements, 16
- Health services, 24
- Housing, 25
- Human nutrition, 11, 28
- Index of courses, 57
- International nutrition, 12, 29
- Joint faculty, 5
- Mathematics, 44
- Medical care, 24
- Microbiology, 45
- Nondegree applicants, 16
- Nutrition, advanced courses, 18, 27
 - animal, 11, 30, 54
 - clinical, 11, 30, 35
 - human, 11, 28
 - international, 12, 29
 - programs at Cornell, 9
 - public health, 11, 30, 35
- Nutritional biochemistry, 11, 27
- Nutritional science, 11, 18
- Pathology, 48
- Ph.D. degree at Cornell, 13
- Physical biology, 48, 55
- Physics, 39
- Physiology, 18, 48
- Postdoctoral studies, 13
- Poultry science, 27, 43
- Public health nutrition, 11, 30, 35
 - traineeships, 24
- Registration, 17
- Registration fee, 22
- Research, special problem, 20, 53
- Residence requirements, 22
- Requirements, admission, 13
 - course, 18
 - English proficiency, 14
 - graduation, 17
 - health, 16
 - residence, 22
- Rural sociology, 50
- Seminars, 18, 53
- Social studies, 50
- Sociology, 50
- Special problem report, 20, 53
- Specializations, 11
- Statistics, 18, 45
- Summer session, 22
 - fee, 23
- Thesis, special problem, 20, 53
- Traineeships, 23
- Tuition and fees, 22
- Vegetable crops, 44

CORNELL UNIVERSITY ANNOUNCEMENTS

The Cornell *Announcements* are designed to give prospective students and others information about the University. The prospective student should have a copy of the *Announcement of General Information*; after consulting that, he may wish to write for one or more of the following *Announcements*:

- New York State College of Agriculture
- College of Architecture, Art, and Planning
- College of Arts and Sciences
- Department of Asian Studies
- Education
- College of Engineering
- New York State College of Home Economics
- School of Hotel Administration
- New York State School of Industrial and Labor Relations
- Center for International Studies
- Officer Education (ROTC)
- Summer Session

Undergraduate preparation in a recognized college or university is required for admission to certain Cornell divisions, for which the following *Announcements* are available:

- Graduate School: Biological Sciences
- Graduate School: Humanities
- Graduate School: Physical Sciences
- Graduate School: Social Sciences
- Law School
- Veterinary College
- Graduate School of Business and Public Administration
- Graduate School of Nutrition
- Medical College (New York City)
- Cornell University-New York Hospital School of Nursing (New York City)
- Graduate School of Medical Sciences (New York City)

Requests for the publications listed above may be addressed to
CORNELL UNIVERSITY ANNOUNCEMENTS
Edmund Ezra Day Hall, Ithaca, New York 14850

(The writer should include his zip code.)