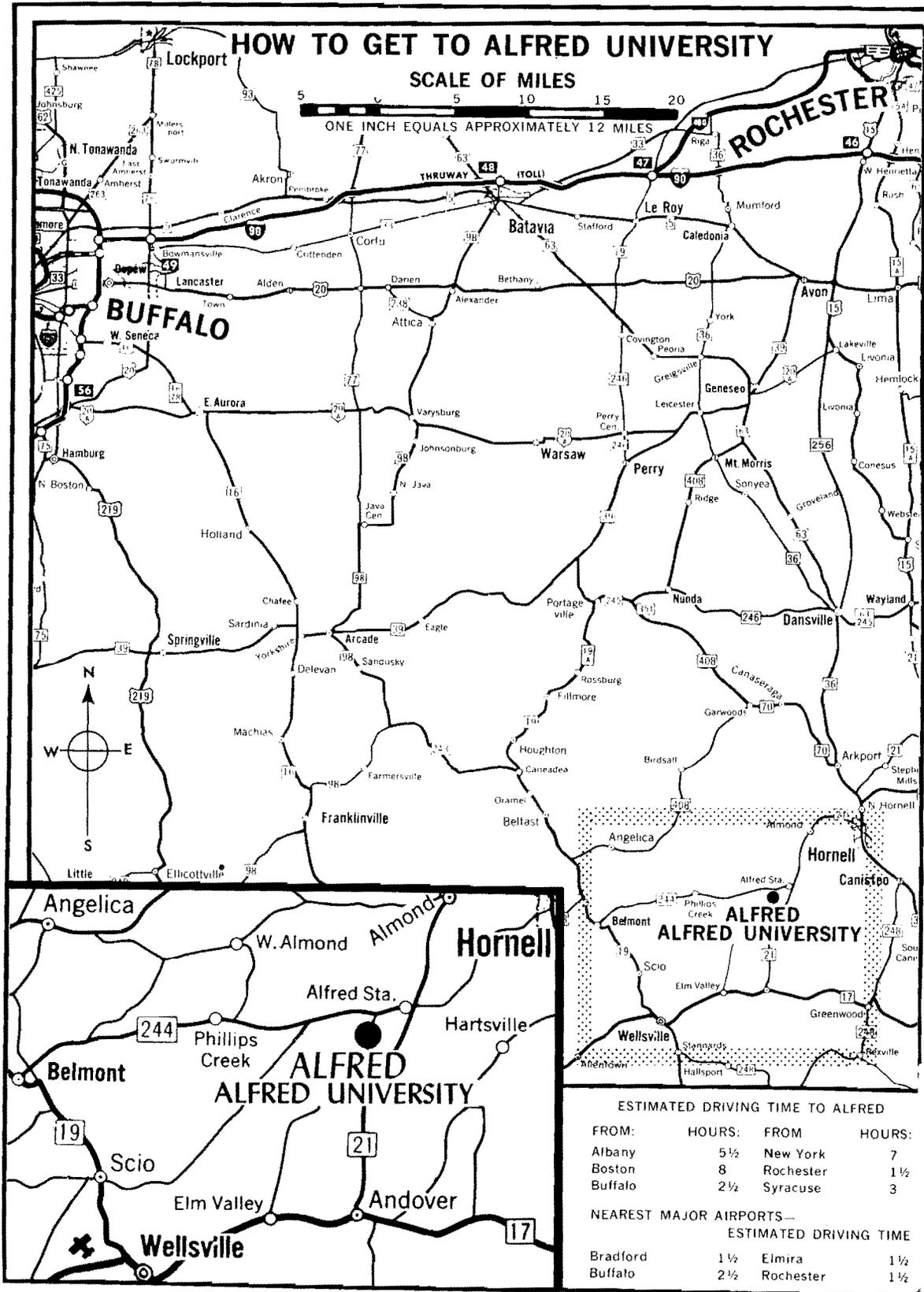


ALFRED
UNIVERSITY
PUBLICATION

State University of New York
COLLEGE OF CERAMICS
at
Alfred University

CATALOG NUMBER 1969-1970



LOCATION

The University is located in Alfred, New York, a college town 70 miles south of Rochester, 90 miles southeast of Buffalo, and 70 miles west of Elmira. The campus is easily accessible north-south from U.S. 15, and east-west from N.Y. 17, famous as "America's most scenic highway." The Southern Tier Expressway, now being constructed parallel to N.Y. 17, will soon bring Alfred within four and a half hours of New York City.

The Erie Lackawanna Railroad serves nearby Hornell. The Short Line bus to New York City stops at nearby Andover, and chartered air service is available from airports at Hornell and Wellsville. Rochester, 37 minutes by air from New York City, is served by the major airlines. A special University bus provides connections with these services.

VISITORS

Visitors are welcome at any time. University offices are open regularly Monday through Friday from 8:30 a.m. to 12:00 noon and from 1:00 p.m. to 4:30 p.m., and guides are usually available. Visitors to the Office of Admissions, in Carnegie Hall, are requested to write in advance for appointments.

Correspondence

The post office address is Alfred University, Alfred, New York, 14802
Inquiries should be addressed as follows:

Area Code 607

	Phone
General interests: the President	587-3010
Specific information concerning the College: the Dean (College of Ceramics)	587-8111
	College of Liberal Arts .. 587-2261
	School of Nursing) 587-3504

For catalogs, admissions information, scholarship:

the Director of Admissions	587-2854
the Dean of Students	587-2271
Business matters: the Treasurer	587-3655
Alumni Affairs: the Director of Alumni Program	587-5515
Summer School: the Director of the Summer School ..	587-5523
Transcripts and Records: the Registrar	587-2202

Rooms or the social life of students:

Business matters:
Alumni Affairs:
Summer School:
Transcripts and Records:

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ALFRED UNIVERSITY PUBLICATION CATALOG 1969-1970

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IN PURSUIT OF DISTINCTION

Robert Browning, the apostle of striving, said that "a man's reach should exceed his grasp." Alfred University not only intends to reach out, but also grasp distinction in the years immediately ahead. We have leased a research vessel, *Lake Diver IV*, with which to embark on aquatic studies on Seneca Lake. This aquatics work is part of a larger undergraduate program in environmental studies, through which the student learns how to apply his theoretical knowledge in biology or chemistry to such practical regional problems as air pollution and water conservation. Other innovations include programs in international studies (with emphasis on Africa and the Middle East), elementary education and social research technology. This latter program prepares young men and women to hold middle management positions in university and industrial computer centers. Because the University's Department of Art is of exceptional quality, the Liberal Arts College is able to provide an unusual opportunity for students who may wish to earn the Bachelor's degree with a major in fine arts. This major includes the fields of art, literature, music and theater. Equally distinctive and perhaps unique is Alfred's "Operation Opportunity", beamed toward the secondary school student who deserves a second chance to prove that he is college material. One of the most distinctive developments at Alfred University is the recent creation of a Division (eventually a School) of Business Administration. This new academic unit offers its own B. S. in Business Administration degree. This program features a special "sub-major block" through which the student may take courses (for example) in ceramic engineering, nursing, or international studies, in order to prepare for executive careers in the ceramics industry, hospital administration, or overseas commerce.

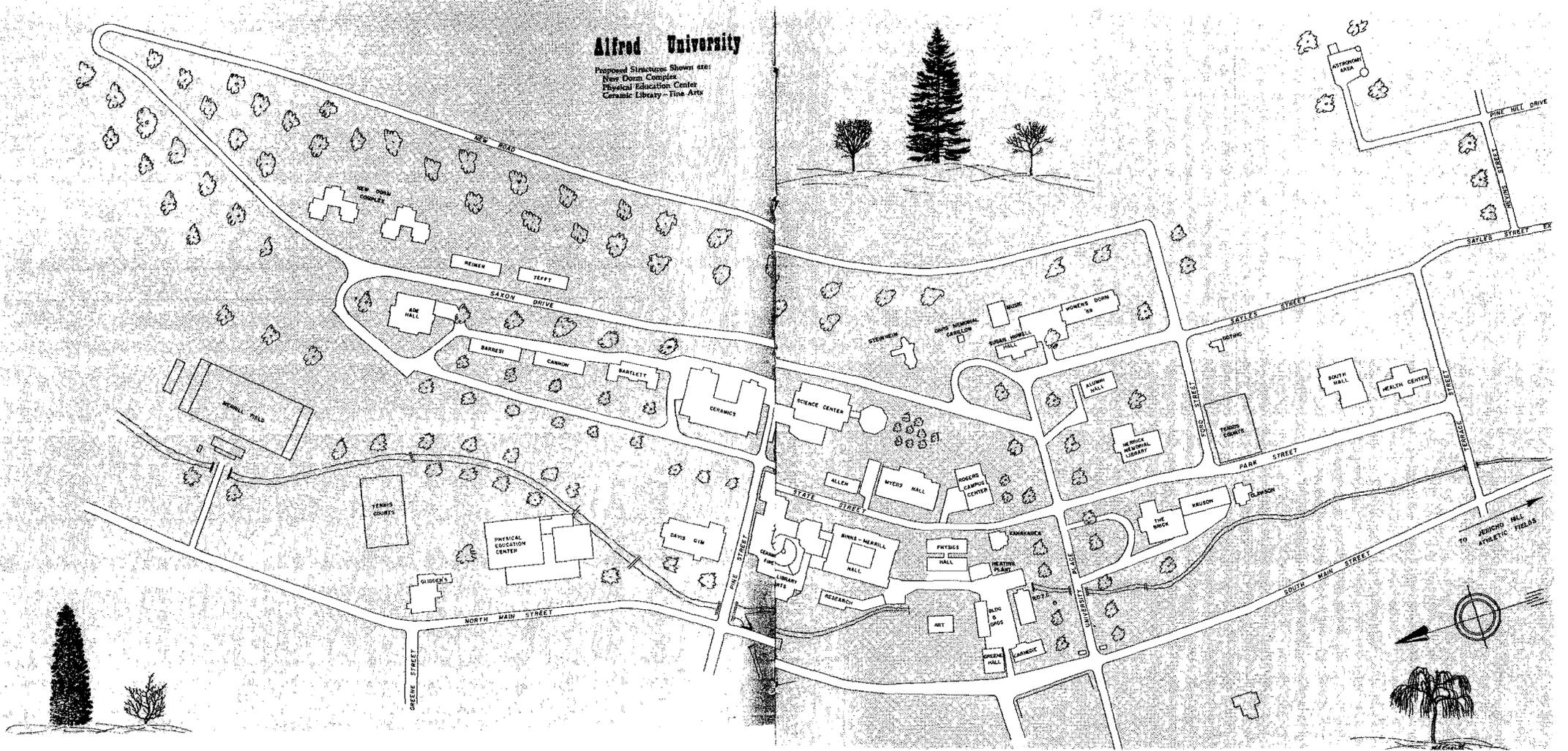
Part of becoming distinctive is becoming relevant. In the years ahead Alfred intends to go where the action is, and to bring the action to itself. Part of this "action" program is a projected calendar change featuring a five-week field term during which the student may study independently in San Francisco, Madrid, or anywhere else in the world. Another part of this program is an attempt to get in touch with the cities. Elsewhere in this catalog you will read about Alfred's new relation to Rochester. This relation represents the initial step in a project to link the University with the metropolitan centers of Western New York. Still another part of Alfred's "action" program is to bring to the campus a constant flow of individuals who represent the world's major intellectual, cultural, social and political forces. At the new Alfred, students sit on the floor and debate with the world's leading thinkers—such people as James Farmer, Sidney Hook, Paul Douglas, and C. P. Snow.

If you want to be where there is ferment, experimentation, and excitement then you will want to be at Alfred as an undergraduate. But don't come unless you can bring some of your own ideas.

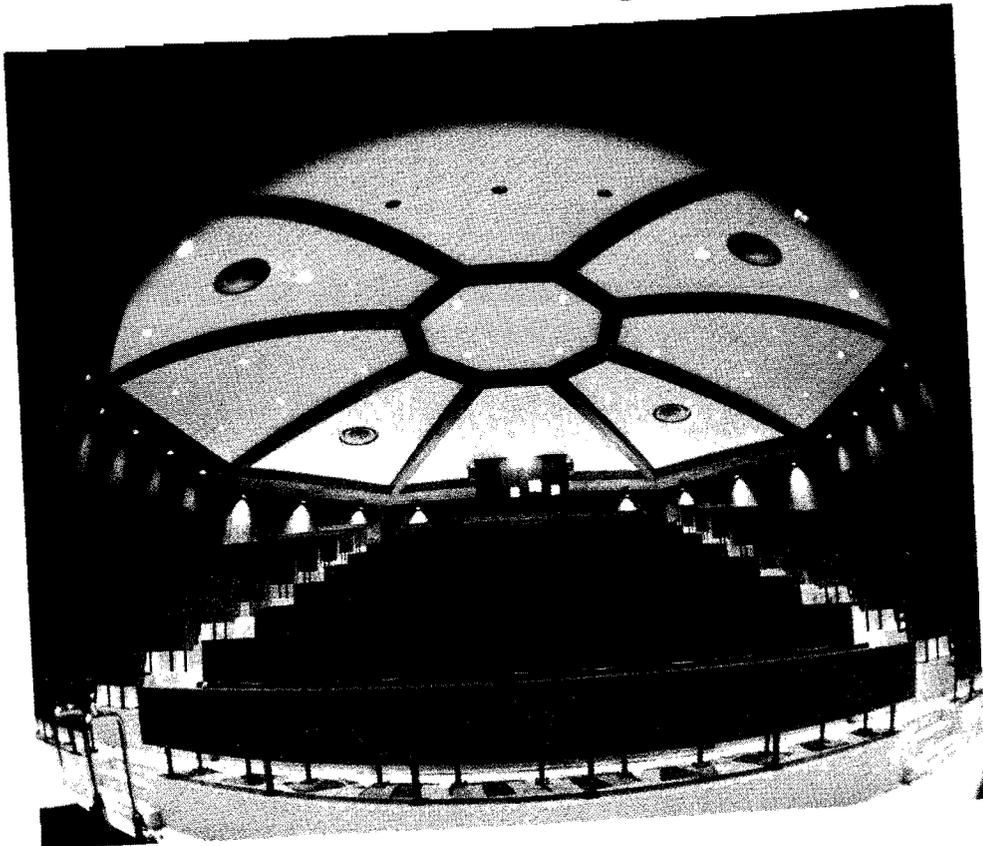
LELAND MILES
President

Alfred University

Proposed Structures Shown are:
New Dean Complex
Physical Education Center
Ceramic Library-Fine Arts



College of Ceramics



The College of Ceramics, a unit of State University of New York and an integral part of Alfred University, is a unique institution. Its uniqueness lies in its objectives, its organization, and, more particularly, in the breadth of its offerings and the depth of its treatment of subject matter.

Established in 1900 for the purpose of advancing the art and science of ceramics, the College has maintained leadership in the field of ceramic education since that time. Leadership has been maintained through the teaching and scholarly activities of its faculty, through an awareness of developments taking place in ceramics and in ceramic education, and through continuous development of its physical plant as well as of its teaching-research equipment.

The College has, since its beginning, offered programs leading to the Bachelor's degree in Ceramic Engineering, Ceramic Science, and Ceramic Art. The program leading to the Bachelor of Science degree in Glass Science was initiated in 1932.

The first Master's degree in Design was conferred in 1932; the first Master of Science degree, in 1933; and the first Ph.D. degree, in 1958.

The enrollment has increased from 17 in 1900 to 529 at the beginning of the 1968-69 school year. The present student body is composed of students coming from 51 counties in New York State, from 21 other states, and from 11 foreign countries. While the majority of students are working toward the Bachelor's degree, 49 are graduate students seeking advanced degrees. Of the graduate students, 19 are working toward the Ph.D. degree.

Buildings and Equipment



The State will triple its facilities for the College of Ceramics on the Alfred University campus within the next three years. Contractors will break ground during the summer of 1969 for a new Library-Fine Arts Building which will cost an estimated \$5 million. President Miles has commented that it will be "the largest and probably the most beautiful edifice ever to be constructed on the Alfred campus."

The structure will provide greatly expanded quarters for the Library of the College of Ceramics which now is housed in Binns-Merrill Hall. It also will provide an auditorium of 400 seats in which major lectures, seminars, and continuing education programs will be presented as well as concerts and dramatic productions. The Art Department also will have offices, studios, and kilns in the building in addition to a gallery for the showing of student and faculty works and for touring exhibitions.

The Ceramic Engineering Department now shares the three-story Industrial Building with neighboring State University Agricultural and Technical College. The College of Ceramics will occupy the Industrial Building's entire 56,000 square feet by 1971 when the Glass Science Department also will be housed there.

Binns-Merrill Hall, which is now the main facility of the Ceramic College, will continue to house the Ceramic Science Department. This building, completed in 1953, contains 58,000 square feet of working space and equipment providing the finest and the most complete facilities for ceramic education anywhere in the world. It contains a library; computer center; laboratories for compounding and testing claywares and glass products; petrography and mineralogy laboratories; chemistry laboratories; lecture rooms; a pottery shop; rooms for drafting, drawing, painting and modeling; laboratories for research and development and a two-story kiln room, 194 feet long.

An annex, which was constructed in 1949, has been equipped to offer a special course in unit operations and to serve as a pilot plant. In this building advanced studies in product development are conducted.

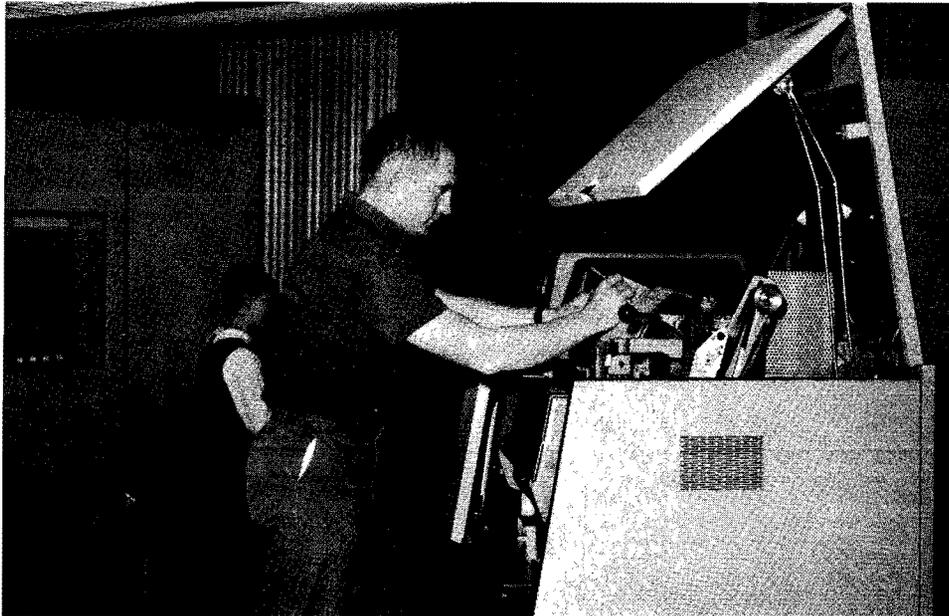
The ceramic laboratories are equipped with apparatus and machinery needed for clay working, glass making, mineral processing, batch mixing, batch preparation, shaping and forming of ware, melting, drying, firing, testing, and mineral analysis. The special laboratories—such as those for chemistry, petrography, spectroscopy, electron microscopy, x-rays, and mass spectrometry—are completely equipped. In addition to the major facilities there are available the many small items of equipment and apparatus essential to special studies and research.

The Computer Center was officially opened on June 21, 1963. An IBM 1800 real-time computer already has replaced the original IBM 1620 computer and additional equipment has been acquired to meet rapidly expanding needs. The center is a significant part of the teaching and research facilities, providing for research activity and computing instruction in conjunction with the engineering, scientific, and technological courses. Other functions of the Center include aiding in student registration procedures, keeping student records, grading and evaluating student exams, and handling accounting procedures of the College of Ceramics.

In the corridors of Binns-Merrill Hall are various exhibits and displays which indicate the products and the processes as well as the arts and sciences with which the College is concerned. Notable among the exhibits are the Binns Pottery Collection, the Carder Glass Collection, the Silverman Glass Collection, the Locke Glass Collection, the Wesp Collection, and the John R. Fox Collection.

Another building occupied in 1963 provides an air conditioned laboratory approximately 40 by 80 feet with facilities for graduate student research including the electron microscope and electron microbeam probe. In the basement of this building there are a glass-working shop and a small machine shop for use by graduate students.

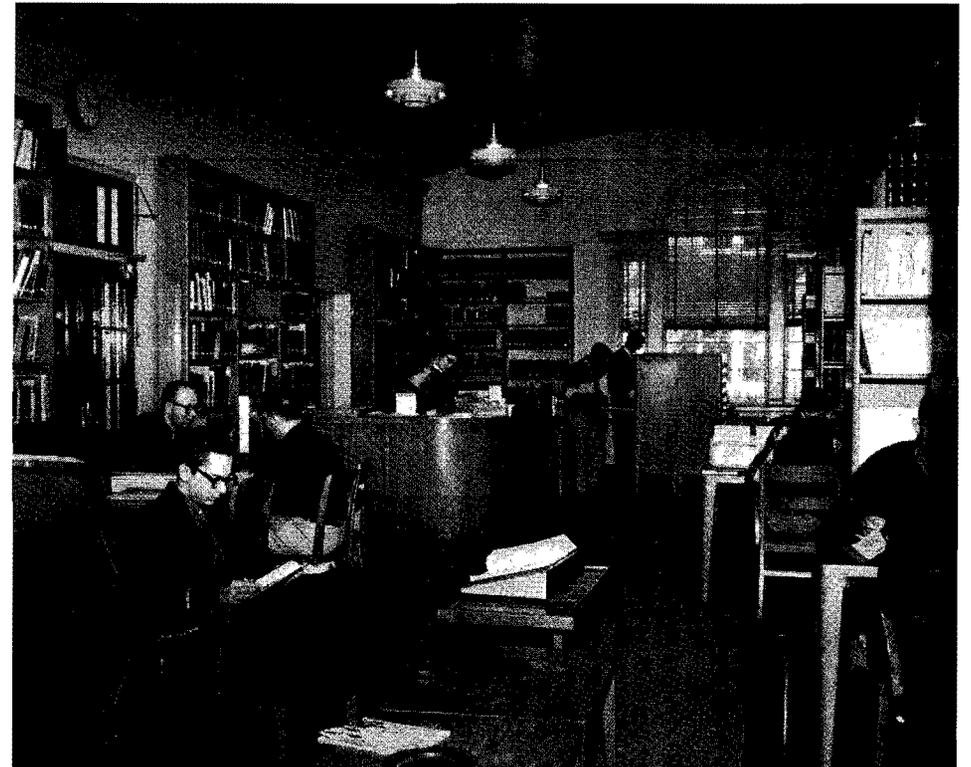
Some of the research which is under the direction of the College staff is housed in buildings owned by Alfred University.



The College of Ceramics Library

A highly important facility of The College is the ceramic reference library located in Binns-Merrill Hall. Under the guidance of trained librarians, the students find here a wealth of published material relating to all phases of ceramic engineering, ceramic science, art, and design, as well as to the sciences. The library is open seven days and six evenings each week.

The number of bound volumes of art and technical books approximates 45,000. In addition, the library has many unbound bulletins, reprints, pamphlets, and student theses. More than 600 periodicals are currently received on subscription. In addition, a library of 30,000 photographic slides is available for art department activities.





College of Ceramics

Degrees

Admissions

Expenses

Degrees

Students in the College of Ceramics may graduate with Bachelor of Science degrees in ceramic engineering, ceramic science, glass science, or a Bachelor of Fine Arts degree in ceramic art.

Through its Graduate School, the University also offers work leading to the Master of Arts, Master of Science in Education, Master of Science, Master of Fine Arts, and Doctor of Philosophy degrees.

Admission to the Undergraduate Degree Programs

The University is concerned with the pattern of life which each individual applicant is developing for himself. The Admissions Officers interpret the University to the prospective student; the student must then decide for himself whether Alfred's program for learning and living should become a part of his life.

POLICY Admission to Alfred University is open to all persons of good character who can demonstrate the potential for college level work in the environment fostered at Alfred. The number of entering freshmen is limited to the available accommodations. The University desires students from diverse backgrounds and geographic areas.

The Admissions Office bases its selection on the following criteria: character, academic background and potential, extra-curricular interests, motivation for a college education, and the desire of the applicant to attend Alfred University.

Special consideration will be given direct relatives of Alfred University alumni.

**RECOMMEN-
DATION FOR
ADMISSION** Among applicants for admission to the College of Ceramics, preference will be given to students whose high school work reflects the distribution outlined below.

CERAMIC ENGINEERING, CERAMIC SCIENCE, GLASS SCIENCE

- (1) 4 units of English
- (2) 3 units of academic mathematics (4 units preferred)
- (3) 2 units of laboratory science to include chemistry and physics
- (4) 2 units of social studies and history

The remainder of the 16 academic units should be earned within the same fields listed above or in modern or classical foreign language.

CERAMIC ART

- (1) 4 units of English
- (2) 2-3 units of academic mathematics
- (3) 1 unit of a laboratory science
- (4) 2 units of social studies and history

The remainder of the 16 academic units should be earned within the same fields listed above or in art, design, ceramics, or modern or classical foreign language. A portfolio is required.

PROCEDURE

1. **APPLICATION**—The Director of Admissions will supply prospective students with the necessary publications and application forms. No application will be reviewed by the Admissions Committee until it is complete.¹

The completed application form must be accompanied by a non-refundable \$15.00 application fee.

The academic record (Form 2) of the candidate's secondary school career should be completed and returned to the Admissions Office by the candidate's principal or guidance counselor *at the time the application is filed*. The final grade report, including notification of graduation, filed by the appropriate secondary school official, is necessary before final acceptance is granted.

2. **THE INTERVIEW**—It is assumed that a student-initiated on-campus interview will be part of the admissions procedure. If an applicant cannot appear for such an interview because of extenuating circumstances he should write to the Director of Admissions. Students are welcomed any time with an appointment made in advance. To assist with the interview, an official secondary school transcript should be brought by the student unless the application and credentials are already on file. After February 1, interviews are granted after

¹The University admits a limited number of freshmen in February of each year.

the student has filed credentials. The office hours are 9:00 a.m.–12:00 noon and 1:30 p.m.–4:00 p.m. The Office is also open Saturday mornings for a group interview at 10:30 a.m., from mid-September until April 30. Interview appointments are NOT granted Sundays, Thanksgiving, Christmas, New Year's Day, Good Friday, Memorial Day, Independence Day, and Labor Day. The Admissions Office is located in Carnegie Hall on Main Street.

Under unusual circumstances the University will provide transportation from Dansville, Hornell, Andover, or Wellsville for a prospective student, providing notice is made of such a need at least one week in advance to the Admissions Office.

3. ENTRANCE EXAMINATION—Alfred University is a member of the College Entrance Examination Board and uses the Scholastic Aptitude Test (morning program) and the English Composition Test as the *required* entrance examinations. *In addition, out-of-state Ceramic Engineering candidates are required to take the Achievement Tests in Mathematics, Level I or Mathematics, Level II and Chemistry.*

The Scholastic Aptitude Test is given six times a year, but all candidates for admission are urged to take the required tests on the November, December, or January testing dates.

Registration forms and general information for these tests may be obtained from the secondary school principal or guidance counselor at least one month prior to the testing date.

EARLY DECISION

Alfred University employs an Early Decision Plan which enables the qualified applicant to complete college plans early in the senior year. Under this plan, the application must be filed by November 1, indicating "Early Decision" at the top of the first page. In addition, the academic record (Form 2) must be completed through the junior year and the required College Entrance Examination Board tests taken in March, May, or July prior to the senior year. The secondary school official must certify that only one application is filed. If accepted under this program, the student must submit the *acceptance* deposit and the *housing* deposit within ten days of acceptance. As with all regular candidates, this acceptance is contingent upon successful achievement during the senior year. Candidates for Early Decision who are also candidates for financial assistance will be notified of their award at the time of acceptance.

ACCEPTANCE

1. NOTIFICATION—Committee action, except for Early Decision, occurs primarily in February, March, and April. *All candidates are accepted for admission on a provisional basis with final acceptance being granted after notification of successful completion of the secondary school experience and the return of the health form sent with the provisional acceptance.*

2. CANDIDATE'S REPLY DATE—Alfred University subscribes to the Candidate's Reply Date of the College Entrance Examination Board for all regularly accepted candidates. This date is May 1st.

3. ACCEPTANCE AND HOUSING DEPOSIT—A deposit of \$300 is required of all accepted freshmen applicants and is *not refundable* should the candidate withdraw prior to registration. This deposit is payable by May 1. An applicant accepted for admission after May 1, must submit the deposit within two weeks of notification. \$50 of this deposit reserves a place in the entering class and is *not* applied to any term bill. This \$50 is refunded to the enrolled student, less any unpaid charges, after graduation from the University or following the student's withdrawal if done according to the official prescribed procedure. The remaining \$250 (housing deposit) is applied to the first semester room rent. All freshmen and sophomores live in University residence halls, and meals are served in the University dining halls. The Office of the Dean of Students is responsible for the assignment of rooms for accepted students in August of each year.

4. ORIENTATION AND REGISTRATION—Orientation week at Alfred University is planned to acquaint entering students with faculty, fellow students, the educational program, and the traditions of the University.

ADVANCED PLACEMENT AND CREDIT BY EXAMINATION

To encourage students with outstanding ability and enterprise, Alfred University has adopted the following policies relative to advanced placement and credit by examination.

Students who have participated in the College Board Placement Program, New York State College Proficiency Examination, or in some equivalent program before entering college may, after admission to the University, present the pertinent records to a review committee consisting of the Dean of the College of Liberal Arts, the Dean of the College of Ceramics, and the Registrar, who will, on the advice of faculty members in the areas most concerned, judge the student's accomplishment. (The Dean of the College of Liberal Arts and the Dean of the College of Ceramics will alternate as chairman of this review committee).

If such records have been filed with the Admissions Office, they will normally come to the attention of the committee after a student has been admitted.

Committee action may

- (1) grant Alfred University academic credit and recognize the earlier work as satisfying prerequisites when appropriate for advanced courses, or
- (2) allow earlier work to satisfy prerequisites although no credit is granted, or
- (3) deny credit or prerequisite recognition of earlier work.

A student will not be permitted to repeat for credit any work for which the review committee has granted credit.

The review committee will also consider petitions (normally filed with the Registrar) from matriculated students wishing to be examined for credit in undergraduate courses which they have not taken. The review committee, with the advice of the faculty members in the areas most concerned, will decide whether each such request is well substantiated and, if so, will call on the department involved to examine the student by methods satisfactory to the committee.

The following regulations apply to matriculated students seeking the privilege to challenge a course for credit and/or advanced placement:

- (1) All applications for challenge should be made in writing to the Registrar.
- (2) A student may challenge a course only once.
- (3) A student may not challenge a course which he has previously taken—either at Alfred University or elsewhere.
- (4) A student may not challenge a course after he has been officially registered in that course.
- (5) A student may not challenge a course which he has previously audited.
- (6) Normally, a student's privilege to challenge shall fall within the regulations governing a normal study program.
- (7) A student may not challenge any course required for graduation during the last semester in residence.
- (8) Normally, studio courses numbered in the 300–400 series leading to the B.F.A. degree may not be challenged.
- (9) A student shall be charged a fee of \$15.00 for each challenge examination.

Credit earned in the program of advanced placement and credit by examination (work of C level or better required) shall be recorded with a grade

of P which is not figured in a student's index. No more than 32 credits shall be granted to any student under these procedures. Credit may not be claimed under these procedures for proficiency in studies which are normally part of the high school program.

Although a matriculated student is charged a fee of \$15.00 for each challenge examination taken at Alfred University (see number 7 above), there will be no fees charged by Alfred University for advanced placement examinations taken under other auspices prior to entrance.

ADMISSION OF TRANSFER STUDENTS WITH ADVANCED STANDING IN UNDERGRADUATE PROGRAMS

Students from other approved institutions wishing to transfer to the University are encouraged to file a transfer application provided they are in good academic and social standing. These students are also eligible for financial aid consideration using the same procedures as entering freshmen. The admission of transfer students is subject to the following regulations:

1. Complete transcripts of all secondary school and college work completed should be forwarded to the Director of Admissions with the application form.
2. Credit will be granted for equivalent courses in which the grade of C or higher is earned unless the applicant possesses an associate's degree. Any such applicant will be granted automatic Junior-class standing.
3. Transfer students are subject to the same standards of selection as entering freshmen. If the appropriate tests of the College Entrance Examination Board have been taken, the scores should be forwarded to the Director of Admissions. If these tests have not been previously taken by the transfer candidate, upon request the applicant must make arrangements to do so before review of the application will be made.
4. All final acceptances are contingent upon the successful completion of the student's present academic program.

ADMISSION TO GRADUATE STUDY

To be eligible for admission to the Graduate School, an applicant must have received, or be eligible to receive, the baccalaureate degree from an accredited college or university. His undergraduate record must clearly indicate that he can perform creditably at the graduate level in the academic area of his choice.

Applicants for admission to graduate studies should correspond with the Dean of the Graduate School. Members of the Admissions Committees and Faculties reserve the right to select candidates in relation to the studies to be pursued.

Of the undergraduate students at Alfred University, only seniors in good academic standing may be permitted to enroll in graduate (500 or over) courses. For each enrollment, the permission of the instructor is required. Seniors who have been admitted to the Alfred University Graduate School may, with permission of the Dean, take certain courses for graduate credit during the last semester of the undergraduate program.

OPERATION OPPORTUNITY

Operation Opportunity is a summer academic program at the University which gives the potential college "reject" a chance to prove to himself, his family, and to the University that he is both ready and able to embark on a strong academic program in one of the University's undergraduate colleges. Several categories of students fall under the "rejectionable" heading: the under-achiever, the overachiever (a student whose academic record is superior to his predicted capacity), the student whose record is poor because of personal problems, and the veteran of the armed forces who has been away from formal education for a period of time. Complete information regarding the Operation Opportunity program may be attained by writing: Director, Operation Opportunity, Box 765, Alfred University, Alfred, New York 14802.

OTHER ADMISSIONS

For Summer School and various special programs which students may attend without becoming candidates for degrees, there are no formal admissions procedures. However, the University will expect and require suitable preparation in each instance. Any student permitted by the Admissions Office to take work without being a degree candidate is classed as a special student. As such the student cannot assume that he will automatically be entitled to degree candidacy if he continues in his studies.

Part-time students are identified as those wishing to be candidates for a degree but who will be unable to pursue a full-time academic course of study. Such applicants must file an application and credentials with the Admissions Office indicating "Part-time Student" at the top of the application form.

FOREIGN STUDENTS

Alfred University has always welcomed students from other countries and has many nationalities presented in its student body. It is advantageous for foreign students to make application well in advance to allow for evaluation of credentials and travel arrangements. Test of English as a Foreign Language is required of all students for whom English is not their native tongue. Also proof of financial backing (for unsponsored foreign students) must be supplied.

Tuition, Fees and Expenses

College of Ceramics	New York State Resident	Out of State Resident
Room (per student)	\$ 500	\$ 500
Board	600	600
Tuition	400	600
General Fee	110	110
Other Fees estimated	190 ¹	190 ¹
Books	100 ²	100 ²
	\$1,900	\$2,100

Tuition is charged for courses repeated for any purpose, with charges regulated by the cost of accessory instruction.

Notes on Expenses

All undergraduates pay a University Fee of \$148 per year, and a Student Fee of \$44 per year.

The University Fee covers such University services as athletics, library, health center, campus center, health insurance, cultural programs, and transportation. The health center segment of the University Fee covers the services of the University physician and nurses for a maximum of two weeks in the University Health Center. A supplementary fee of \$4.00 per day is charged for health center care beyond two weeks. The costs of such items as prescriptions, serums, and special drugs are personal expenses. The health insurance segment of the University Fee covers accident and sickness benefits in a hospital of the student's choice. A pamphlet is distributed at registration time describing in detail the University's student health program.

The Student Fee covers the *Fiat Lux* (student newspaper), the *Alfred Review* (student literary magazine), the *Kanakadea* (student yearbook), the Student Senate, and special Student Activities (e.g., dances, concerts) sponsored chiefly by the Campus Center student board of managers.

College of Ceramics undergraduates also pay a General Fee of \$110 per year as a tuitional supplement. This General Fee covers a variety of Ceramics expenses, including general administration, special lecturers, and student financial aid.

¹A \$4 per credit hour materials fee is charged for studio courses in sculpture, pottery and glass.

²Design students also pay a \$100 deposit for supplies.

Note: For Graduate School and Summer School, see separate catalogs.

Residence Hall students are charged \$28 per year for linen service. Other fees, deposits, and special assessments as necessary for certain programs are listed under the specific course and program descriptions in this and other Alfred University catalogs.

The \$15 application fee has been discussed as part of the admissions procedure. Special students not admitted through regular application procedures are charged this fee upon first registering in the University. The \$300 acceptance and housing deposit required of all students matriculating as full-time degree candidates is also discussed in detail under admissions. There is a \$15 fee for late registration.

A graduation fee of \$25 is charged to everyone receiving a degree.

PAYMENTS

Bills covering all charges for the first semester are mailed home in early August and must be paid by September 1. Bills covering charges for the second semester will also be mailed home and must be paid by January 15.

Rebates for undergraduate students during the regular academic year are as follows: For students withdrawing during the week of registration, 100 percent of tuition, and student fees (the \$50 acceptance deposit will be withheld on such a withdrawal); for a withdrawal during the first week of classes, 80 percent; during the second week, 60 percent; third week, 40 percent; fourth week, 20 percent. There will be no tuition and fee rebates for withdrawals after the fourth week. There will be no rebates on University room charges. Board charges will be refunded on a pro-rata basis.

Special procedures for refunds have been adopted for men called into military service prior to the end of a semester.

EDUCATION LOAN PLANS

Alfred University has an established plan with both of the financing companies listed below. A brochure describing the plan and an application is mailed to the home address of each student in early summer. The loan agreement is a matter between the parents and the company they select.

Funds for Education, Inc.
319 Lincoln Street
Manchester, New Hampshire 03103

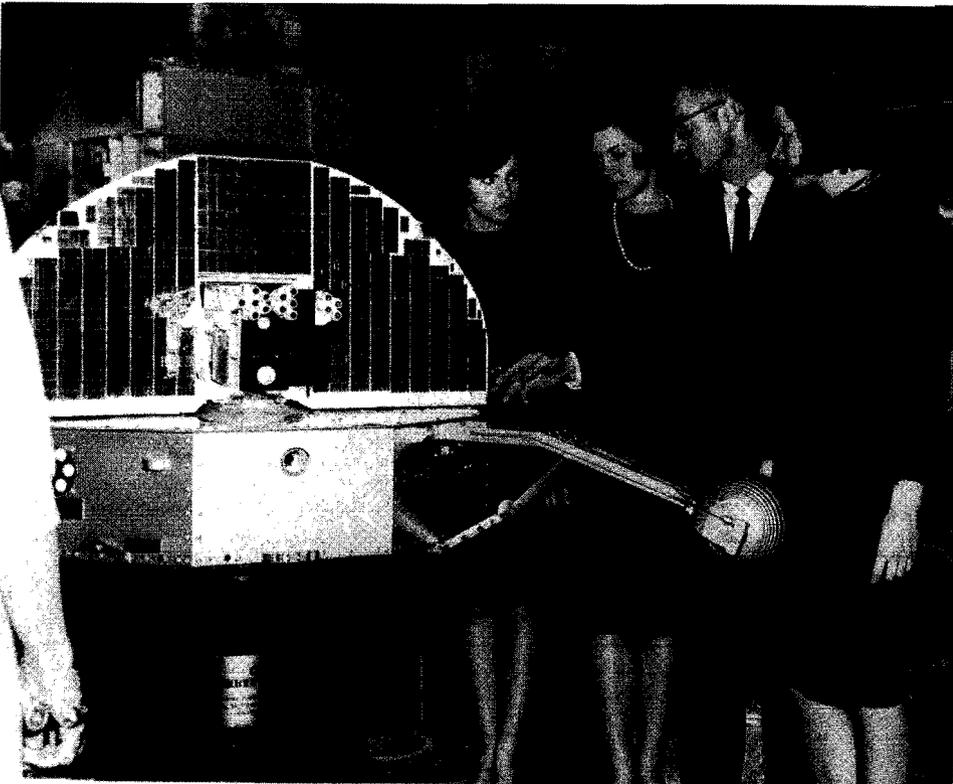
Education Funds, Inc.
10 Dorrance Street
Providence, Rhode Island 02901

Ceramics

History

Education

Profession



Model of N.A.S.A.'s Orbiting Solar Observatory is exhibited on campus during St. Pat's Festival.

Ceramics

"Ceramics" is derived from the Greek word "Keramos," which means "fired earth." Since the beginning of recorded time, man has made and used ceramic products. He began by utilizing naturally occurring clays and has come to use refined clays and every nonmetallic inorganic mineral found in the earth's crust.

Ceramics involves the products of past civilizations, the products of the present age of science, and products for the space age that lies ahead. Ceramics is concerned with science (the searching out of new concepts), with technology (the application of science to new products), with engineering (the manufacture and utilization of products for the benefit and advancement of man), and with design (the culture of man). Its products, because they are practically indestructible, are and will continue to be the markers of man's accomplishments through the ages.

Research is an important element of each of the several aspects of ceramics. Through his research efforts, man is obtaining new and refined products with which to make life more pleasant and scientifically important products with which to advance the boundaries of knowledge.

*The Ceramic Engineer / The Ceramic Scientist
The Glass Scientist / The Ceramic Designer*

The Ceramist of the past concerned himself with clays, feldspar, quartz, limestone, soda ash, and a limited number of other minerals which were used in the manufacture of clay products and glass.

From his knowledge of these materials—how they could be blended—and how they reacted during heating—he became a specialist in the manufacture of building brick, sewer pipe, terra cotta, pottery, window and art glass, floor and wall tile, sanitary ware, and fireclay refractories.

The Ceramist of today concerns himself with every non-metallic, inorganic mineral available and with the development of new and better

a. Portland Cement for: faster and better road building, high temperature applications, use in contact with chemically active materials, better concrete structures.

b. Refractories to: withstand ever-increasing temperatures, overcome reaction with melts of new metals and alloys, resist more effectively the corrosive action of molten glass, withstand severe heat shock, help make better jet engines and rockets, stand up under heavy loads at high temperatures, be suitable for use in atomic energy applications.

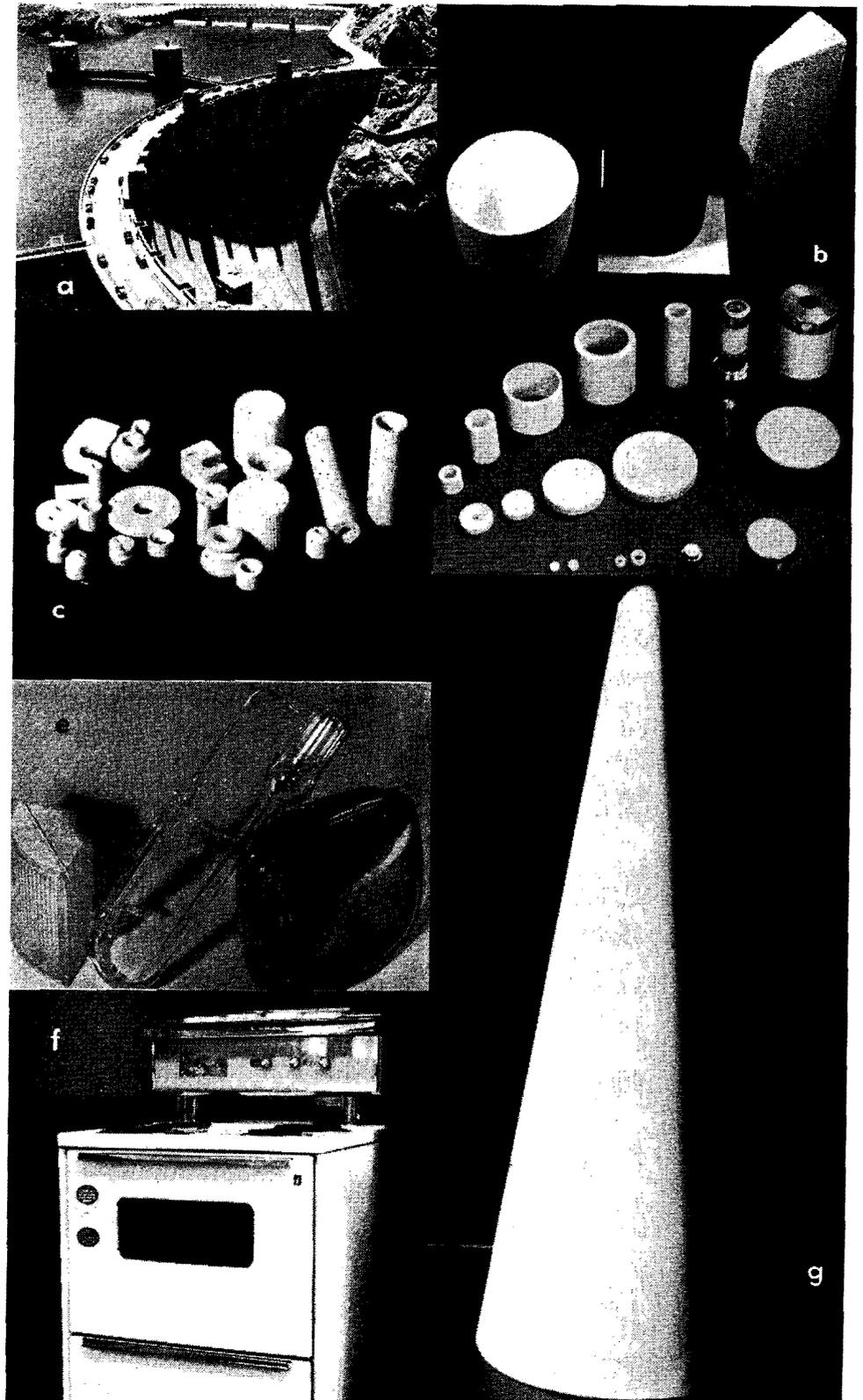
c. Specific Products for: textile, metal polishing, electronics, oil, printing, atomic energy applications.

d. Dielectrics for: radar equipment, radio equipment, calculating machines, television equipment, ultra-high frequency application, electronic devices of all kinds.

e. Glasses for: new optical systems, reflecting signs and markers, television applications, structural uses, electrical light fixtures, heating elements, utensils.

f. Enamels for: use in jet engines, chemical engineering equipment, new household appliances, new jewelry applications, architectural applications.

g. Ceramics for: space vehicles.



A Professional Education in Ceramics

The age in which we live is exciting and challenging to the imagination. Although referred to as the atomic or space age, it is also considered to be the age of ceramics. Present and future developments will depend upon the progress in the ceramic field. Ceramic products are the most heat resistant, most durable, and hardest products available to man. Research in these materials has resulted in the development of products having unique electrical, light transmitting, and corrosion resistant properties. An education in ceramics prepares a person for a career in a field that presents many challenges and for a life of rewarding experiences. In pursuing an education in ceramics, a student will be involved with scientifically oriented studies as in engineering or science or in aesthetically oriented studies as in ceramic art.

The undergraduate programs offered in the College of Ceramics, though varying in objectives and in detail, are structured to provide a strong fundamental base and a broad education as well as a concentration in ceramics. Because it is recognized that no entering student is aware of his potential or of the part he will be expected to play in life, the College insists upon a strong background in fundamental subject matter and in the humanities. The College hopes that when a student graduates he will not only be a capable ceramist, but also a person who can and will assume responsibilities in his community.

Many students will end their formal education upon receiving the baccalaureate degree, but an ever increasing number will be going on to graduate school. The programs offered by the College will prepare the student to reach the goals he will set for himself.

The College offers four courses leading to the Bachelor's degree:

CERAMIC ENGINEER- ING

This program, which is accredited by the Engineers' Council for Professional Development, is directed specifically toward preparation for the profession of Ceramic Engineer. A number of graduates of the program go on to graduate school.

CERAMIC SCIENCE

This program is available to those students who are definitely planning to study at the graduate level. A number of the graduates of this program, however, do go directly into industry.

GLASS SCIENCE

This program is available for those students who are more particularly interested in learning much about glass and who have a desire to enter this field of study. Although most of the graduates of this program enter the glass industry, a number do enter graduate school.

CERAMIC ART

This program, which is accredited by the National Association of Schools of Art, has been developed for those students who wish to work toward the production of beautiful and useful ceramics. It emphasizes the creative processes and is separate as well as distinct from the other programs. Graduates enter industry, set up shops of their own, become teachers, or go on to graduate school.

GRADUATE STUDY

As knowledge is gained and an awareness of the immensity of man's knowledge develops, some students, regardless of the program they are following, are determined to gain more than can be accomplished during the baccalaureate years. Realizing this, the College has developed each of its programs in such a manner as to permit those students who show academic promise to continue their studies at the graduate level at other colleges or at the College of Ceramics (see Graduate School Catalog).

UNDERGRADUATE AND GRADUATE RESEARCH

Studies at the College are carried on in an atmosphere of research, and each undergraduate is required to conduct his own research project. As will be appreciated, this excursion into research cannot be one of great depth. However, it suffices to give the student an insight into the ramifications of original research as well as of the rewards of such efforts.

Undergraduate students who desire more than the required experience in research have unsurpassed opportunities to gain this experience. Faculty members and graduate students, all of whom are involved in some research, are anxious to have the eager, capable students consult with them, and, on many occasions, work with them.

Members of the Teaching Staff of the College work closely and cooperatively with undergraduate students, graduate students, and with other members of the faculty. They carry on original research, each in the area of his own specialization, supervise undergraduate and research theses, and direct sponsored projects.

Research is sponsored by government agencies, by industrial concerns, by organizations, by foundations, by the State of New York, and by the College. Monies received through these sponsorships go to support the educational programs of students. Many undergraduate and graduate students work on sponsored projects, gaining experience as well as financial assistance.

Among the government agencies sponsoring research are the National Aeronautic and Space Agency, National Institute of Health, Department of Health, Education, and Welfare, and the National Science Foundation. Programs may be of a fundamental nature only, but may also have implications for the utilization of new ceramic materials in advanced space and weapons systems.

Among the subjects under study are special properties of semi-conductors, the role of defect structure in catalysis, the correlation between the physical and chemical properties of oxide surfaces, the principles of fuel-cell operation, the dielectric and mechanical losses in solids, the elastic and anelastic properties of polycrystalline ceramics, and the effect of grain boundaries on the thermal conductivity of ceramic materials.

Research being conducted under sponsorship of private industry, organizations, and foundations includes studies of defect structure in relationship to the chemical, physical and mechanical properties of ionic solids, infrared transmitting ceramics, surface properties of silica and alumina co-oxides, high temperature friction materials, the effect of moisture absorption on moisture expansion, lead glass systems, strength of glass, and diffusion of oxygen into glass.

Research sponsored by the State of New York involves studies related to the utilization of New York State minerals, New York State products, new ceramic products, new industries, new manufacturing processes—as well as studies relative to improving teaching and research techniques. Among studies under way are the limestones of New York State, the economical utilization of clays, the development of lightweight material, the development of lightweight products, the differential thermal analysis of minerals, solid state physics, surface chemistry of ceramic materials, and the properties of single crystals.

The Ceramic College is fortunate in having the close cooperation of the Ceramic Association of New York. The Research Committee of this organization acts in an advisory capacity to members of the faculty, and their recommendations contribute greatly to the organization and planning of the research program. Through the Ceramic Association of New York, staff members are able

to obtain the advice of the leading ceramic industrialists of New York as well as the active support of their companies.

The demand for persons trained in research methods and the research attitude as well as in a forward-looking, developmental atmosphere is increasing. The College of Ceramics plans on continuing to contribute materially to this extremely important phase of education.

Support of the research program by the Federal and State governments and by industry makes possible the granting of support to selected undergraduate and graduate students in their thesis work. Some of these fellowships are held by seniors and graduate students on a part-time basis, whereas others are held by full-time research associates. Stipends are commensurate with the experience and ability of the holders and with the time that is devoted to the project under study. Full-time research associates are permitted to take a maximum of twelve semester hours of graduate course work per year.



Curricula

CERAMIC ENGINEERING

CERAMIC SCIENCE

GLASS SCIENCE

CERAMIC ART

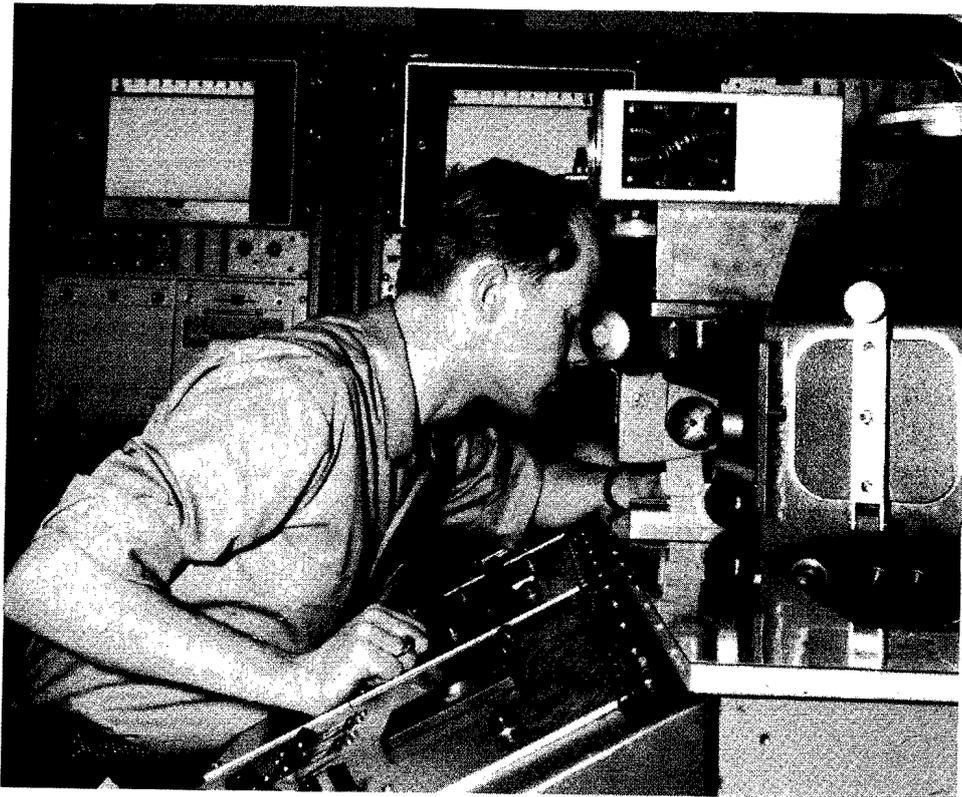
The Faculty of the College of Ceramics is presently considering some changes in the art, engineering, and science curricula. If these are operative by September, 1969, students will be advised at the time of their registration for the first semester, 1969-70.

Ceramic Engineering

Engineering is a profession for which a student must prepare himself, not only in science and technology, but also in the humanities. An engineer must assume an obligation to protect the welfare of mankind, to attain enduring excellence through continued study, and to live according to ethical standards of conduct as in all recognized professions.

The engineer is neat, orderly, and accurate. He designs, creates, and exercises sound judgment. As he carries out his assignments, he is ever conscious of the economic factors involved and of the necessity for safeguarding life, health, and property. An engineer communicates with others with clarity and finesse, not only to get a job done, but also to promote harmony among those with whom he works.

Professor YOUNG, *Chairman*; Professor TUTTLE, Associate Professors KIRKENDALE, TINKLEPAUGH, WEST, Assistant Professors BURDICK, DICKENS, EARL, LEWIS, REED, Instructor FUNK



The ceramic industry has need for engineers. It desires those who can apply their knowledge of the sciences and ceramic technology to its advancement. It needs engineers for production, research development, teaching, and sales.

The undergraduate program leading to the Bachelor of Science degree in Ceramic Engineering prepares the student for a career as a professional engineer. After completing the course, he is eligible to take the Engineer-in-Training examination as well as the final examination required for the Professional Engineer's License.

CERAMIC ENGINEERING

First Year			
<i>First Semester</i>	<i>credit hours</i>	<i>Second Semester</i>	<i>credit hours</i>
Math 119 (Analysis I)	4	Math 120 (Analysis II)	4
Chem. 105 (Gen. Inorganic) . .	4	Chem. 106 (Gen. Inorganic) . .	4
English 101 (Composition) . . .	3	English 102 (Composition) . . .	3
Eng. Gr. 101 (Eng. Graphics) . .	3	Min. 201* (Mineralogy)	3
Cer. Eng. 101 (Int. to Ceramics)	1	Cer. Eng. 102 (Int. to Ceramics)	1
Cer. Eng. 103 (Laboratory) . . .	1	Cer. Eng. 104 (Laboratory) . . .	1
Cer. Eng. 106 (Computer)	2	P.E. 102 or M.S. 112	1
P.E. 101 or M.S. 111	1		17
	19		

Second Year			
<i>First Semester</i>	<i>credit hours</i>	<i>Second Semester</i>	<i>credit hours</i>
Math 219 (Analysis III)	3	Math 220 (Analysis IV)	3
Chem. CH215 (Analytical)	4	Chem. CH 244 (Int. to Physical)	3
Physics 115 (Gen. Physics I) . .	3	Physics 116 (Gen. Physics I) . .	3
Cer. Eng. 205 (Materials)	3	Cer. Eng. 206 (Operational	
Cer. Eng. 203 (Laboratory) . . .	1	Techniques)	3
Non-technical elective	3	Cer. Eng. 204 (Laboratory) . . .	1
P.E. 203 or M.S. 221	1	Non-technical elective	3
	18	Engl. 335 (Technical Writing)	2
		P.E. 204 or M.S. 222	1
			19

*Course listed under Ceramic Science.

Third Year			
<i>First Semester</i>	<i>credit hours</i>	<i>Second Semester</i>	<i>credit hours</i>
Chem. CH 345 (Physical Chem.)	4	Math 466 (Eng. Statistics)	3
Physics 283 (Gen. Physics II) . .	3	Physics 284 (Gen. Physics II) . .	3
Physics 285 (Laboratory)	1	Physics 286 (Laboratory)	1
Cer. Eng. 327 (Crystal Chem.)	3	Cer. Eng. 332 (Transport Properties)	3
Cer. Eng. 305 (Laboratory) . . .	1	Cer. Eng. 306 (Laboratory) . . .	2
Eco. 211 (Economics)	3	Non-technical elective	3
Non technical elective or M.S. 331	3	Technical elective or M.S. 332	3
Cer. Eng. 371 (Seminar)	0		18
	18		

Fourth Year			
<i>First Semester</i>	<i>credit hours</i>	<i>Second Semester</i>	<i>credit hours</i>
Cer. Eng. 431 (Operations Res.)	3	Cer. Eng. 474 (Plant Design) . .	3
Cer. Eng. 419 (Strength-Structures)	4	Ceramic Elective	3
Cer. Eng. 403 (Physical Ceramics)	4	Cer. Eng. 404 (Props of Ceramics)	4
Cer. Eng. 405 (Laboratory) . . .	2	Cer. Eng. 406 (Laboratory) . . .	2
Cer. Eng. 435 (Elec. Eng.)	3	Non-technical elective or M.S. 442	3
Cer. Eng. 471 (Seminar)	0		15
(M.S. 441)	(3)		
	16 or 19		

Total required hrs. for graduation 140

Ceramic Science

A ceramic scientist is a person who has competency in chemistry, physics, mathematics, the earth sciences, and in ceramic science. He is a person who has an interest in research and development. Having an understanding of the art of ceramics and having an imaginative, curious mind, he applies his scientific knowledge to the development of new concepts, new processes, and new products.

The program leading to the degree of Bachelor of Science in Ceramic Science, while involving studies in depth in chemistry, physics, mathematics, and ceramic science, involves also studies in the humanities. It is particularly suited to those students who wish to prepare themselves for graduate study. It is a flexible program permitting a person, through electives, to take extra courses in one of the basic sciences, in mathematics, in the earth sciences, or in ceramic science.

The ceramic industry has need for persons who can bring to it a sound understanding of the basic sciences, a knowledge of its art, and a desire to contribute to its advancement. It needs persons equipped and willing to take on the tasks of innovating compositions, processes, and products for jet engines, for nuclear reactors, for electronics, for outer space vehicles as well as for everyday ceramics.

The industry recognizes that its future will depend greatly on the availability of competent ceramic scientists.

Professor BROWNELL, *Chairman*; Professor FRECHETTE, Associate Professors CRAYTON, JILLSON, LAMPREY, RASE, ROSSINGTON, WEINLAND, Assistant Professors CONDRATE, MARTIN, MONROE, Instructor COLLINS



CERAMIC SCIENCE

First Year			
<i>First Semester</i>	<i>credit hours</i>	<i>Second Semester</i>	<i>credit hours</i>
Math 119 (Analysis I)	4	Math 120 (Analysis II)	4
Chem. 105 (Gen. Inorganic) ..	4	Chem. 106 (Gen. Inorganic) ..	4
English 101 (Composition) . . .	3	English 102 (Composition) . . .	3
Eng. Gr. 101 (Eng. Graphics)..	3	Min. 201* (Mineralogy)	3
Cer. Eng. 101 (Int. to Ceramics)	1	Cer. Eng. 102 (Int. to Ceramics)	1
Cer. Eng. 103 (Laboratory) . . .	1	Cer. Eng. 104 (Laboratory) . . .	1
Cer. Eng. 106 (Computer)	2	P.E. 102 or M.S. 112	1
P.E. 101 or M.S. 111	1		
			17
	19		

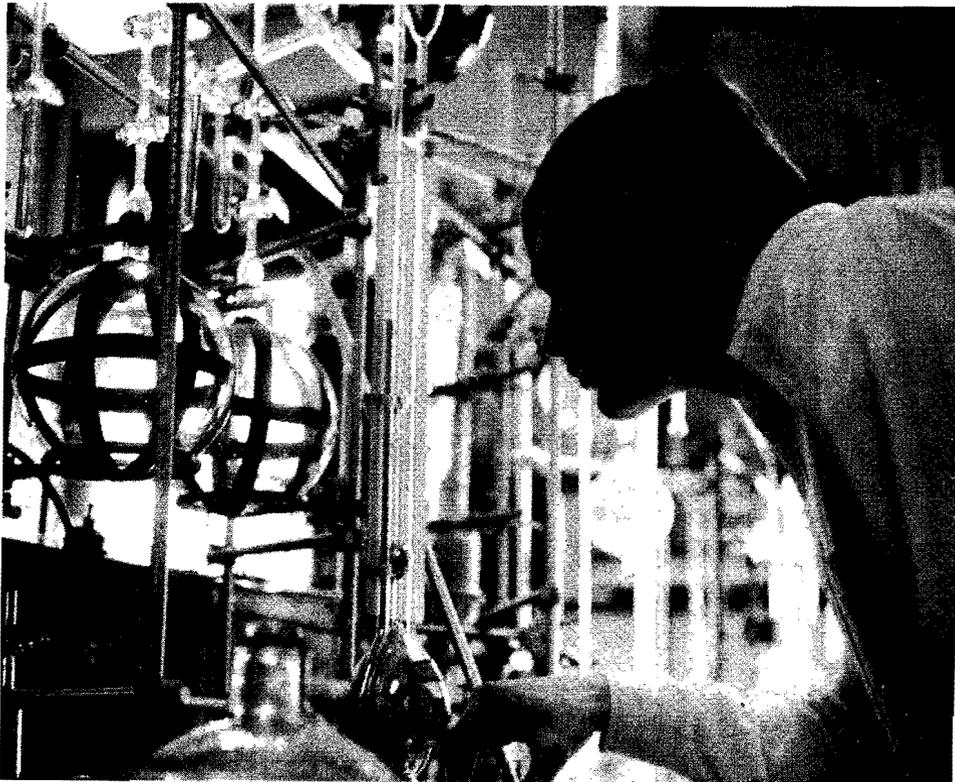
Second Year			
<i>First Semester</i>	<i>credit hours</i>	<i>Second Semester</i>	<i>credit hours</i>
Math 219 (Analysis III)	3	Math 220 (Analysis IV)	3
Chem. CH 215 (Analytical) ..	4	Chem. CH 244 (Int. to Physical)	3
Physics 115 (Gen. Physics I) ..	3	Physics 116 (Gen. Physics I) ..	3
Cer. Eng. 205 (Materials)	3	Cer. Eng. 206 (Operational Techniques)	3
Cer. Eng. 203 (Laboratory) ..	1	Cer. Eng. 204 (Laboratory) . . .	1
Non-technical elective	3	Non-technical elective	3
P.E. 203 or M.S. 221	1	Engl. 335 (Technical Writing) 2	
		P.E. 204 or M.S. 222	1
			19
	18		

Third Year			
<i>First Semester</i>	<i>credit hours</i>	<i>Second Semester</i>	<i>credit hours</i>
Chem. CH 345 (Physical Chem.)	4	Math 466 (Eng. Statistics) . . .	3
Physics 283 (Gen. Physics II)..	3	Physics 284 (Gen. Physics II) 3	
Physics 285 (Laboratory)	1	Physics 286 (Laboratory)	1
Cer. Eng. 437 (Physiochem. Equil.)	2	Chem. CH 348 (Physical Chem.)	4
Cer. Eng. 327 (Crystal Chem.) 3		Pet. 302* (Petrography)	3
Non-technical elective or M.S. 331	2-4	Non-technical elective or M.S. 332	3-4
Technical elective	3		17-18
Cer. Eng. 371 (Seminar)	0		
			18-20

Fourth Year			
<i>First Semester</i>	<i>credit hours</i>	<i>Second Semester</i>	<i>credit hours</i>
Physics elective	3	Cer. Eng. 404 (Props. of Ceramics)	4
Cer. Eng. 403 (Physical Ceramics)	4	Cer. Eng. 462 (Thesis)	2
Cer. Eng. 461 (Thesis)	2	Tech. Elective or M.S. 442	5-6
Tech. Elective or M.S. 441 . . .	2-3	Eco. 212 (Prin. and Probs. of Economics)	3
Eco. 211 (Prins. and Probs. of Economics)	3	Non-technical elective	2-4
Non-technical elective	3-4		16-19
Cer. Eng. 471 (Seminar)	0		
			17-19

Total required hours for graduation 142

*Course listed under Ceramic Science.



Glass Science

The Glass Science curriculum prepares graduates for positions in the ever expanding glass industry. Glass, an amorphous solid, finds use in all types of applications including electronic, container, textile, coating, optical, architectural, aerospace, hydrospace. Its versatility, variability, and dependability provide the designer with a material which fills many needs. At the same time these same properties dictate well-educated graduates to fill positions of responsibility in the production, sales, and research areas of the glass industry.

The student in Glass Science takes basic courses in mathematics, chemistry, physics, and ceramics with courses specializing in glass in the last two years. Sufficient flexibility is present in the program to allow the student to elect courses which will emphasize the "engineering" aspects of glass production; the technical or scientific phases of amorphous, inorganic materials. For those interested in graduate work the program provides the opportunity for additional mathematics, science, and foreign language courses.

The student who decides to elect study in the glass area at the end of his sophomore year may plan his remaining two-year program in close cooperation with his adviser, keeping in mind his objectives and abilities. The flexibility offered provides every student with an opportunity to develop in his particular area of interest.

Professor LAWRENCE, *Acting Chairman*; Professor GREENE, Assistant Professor PYE

GLASS SCIENCE

First Year			
First Semester	credit hours	Second Semester	credit hours
Math 119 (Analysis I)	4	Math 120 (Analysis II)	4
Chem. 105 (Gen. Inorganic) ..	4	Chem. 106 (Gen. Inorganic) ..	4
English 101 (Composition) ...	3	English 102 (Composition) ...	3
Eng. Gr. 101 (Eng. Graphics) 3		Min. 201* (Mineralogy)	3
Cer. Eng. 101 (Int. to Ceramics) 1		Cer. Eng. 102 (Int. to Ceramics) 1	
Cer. Eng. 103 (Laboratory) ...	1	Cer. Eng. 104 (Laboratory) ...	1
Cer. Eng. 106 (Computer)	2	P.E. 102 or M.S. 112	1
P.E. 101 or M.S. 111	1		
			17
	19		

Second Year			
First Semester	credit hours	Second Semester	credit hours
Math 219 (Analysis III)	3	Math 220 (Analysis IV)	3
Chem. CH 215 (Analytical) ..	4	Chem. CH 244 (Int. to Physical)	3
Physics 115 (Gen. Physics I) ..	3	Physics 116 (Gen. Physics I) ..	3
Cer. Eng. 205 (Materials) ...	3	Cer. Eng. 206 (Operational Techniques)	3
Cer. Eng. 203 (Laboratory) ...	1	Cer. Eng. 204 (Laboratory) ...	1
Non-technical elective	3	Non-technical elective	3
P.E. 203 or M.S. 221	1	Engl. 335 (Technical Writing) 2	
		P.E. 204 or M.S. 222	1
			19
	18		

Third Year			
First Semester	credit hours	Second Semester	credit hours
Physics 283 (Gen. Physics II) 3		Physics 284 (Gen. Physics II) 3	
Physics 285 (Laboratory) ...	1	Physics 286 (Laboratory) ...	1
Electives**	4	Electives**	4
Chem. CH 345 (Physical Chem.)	4	Pet. 302* (Petrography)	3
Glass GL 301 (Manufacturing) 3		Glass GL 302 (Properties I) ..	3
Glass GL 351 (Laboratory) ..	2	Glass GL 352 (Laboratory) ..	2
Glass GL 371 (Seminar)	1	Glass GL 372 (Seminar)	1
			17
	18		

Fourth Year			
First Semester	credit hours	Second Semester	credit hours
Electives**	5	Electives**	8
Cer. Eng. 332 (Transport Props.)	3	Cer. Eng. 435 (Electrical Sci.) ..	3
Eco. 211 (Prins. and Probs. of Economics)	3	Glass GL 404 (Melting)	3
Glass GL 403 (Properties II) ..	3	Glass GL 462 (Thesis)	2
Glass GL 461 (Thesis)	2	Glass GL 472 (Seminar)	1
Glass GL 471 (Seminar)	1		
			17
	17		

Total required hrs. for graduation 142

*Course listed under Ceramic Science.

**The total 21 credit hours of elective shall be divided 12 credit hours of technical elective and 9 credit hours of non-technical elective.

Ceramic Art

The Bachelor of Fine Arts degree (B.F.A.) program offers four years of study in art, ceramic art, science and the humanities. The program has two main objectives: to build a general education with a specialization in art; to prepare the talented student for graduate work in the various art and design programs offered by graduate schools throughout the country and abroad.

A two-year foundation program is required. This includes lecture studies in history, literature, mathematics, sciences and the history of art—and studio studies in painting, sculpture, visual design, dimensional design, and pottery.

During the last two years 32 credit hours may be elected in: a range of liberal arts subjects to build a creative education of a general nature—or in studio studies as major preparation for graduate work in painting, sculpture, graphics, design, ceramics. A minimum of 28 upper division credit hours in any one of these areas must be presented for the B.F.A. degree. A total of 138 credit hours is required for graduation.

Owing to space limitations admission to the program is restrictive, with preference being given to applicants who are in the upper third of their high school graduating class and who show evidence of exceptional ability in art and design.

Those qualified for advanced study in Ceramic Art may be offered a two-year residence program leading to the Master of Fine Arts degree (M.F.A.). This program provides for a concentrated development of ceramics in its historical, technical, and aesthetic dimensions. Its objective is to help the talented prepare for a way of life in the ceramic arts, a professional career in design, or for the college level responsibilities of artist-teacher in the ceramic disciplines.

The College retains the right to keep any work produced by a student which was done as a part of his academic requirements. However, this right

Professor RANDALL, *Chairman*; Professors RHODES, Associate Professors CUSHING, PARRY, TURNER, WOOD, Assistant Professors CARR, DAVIDSON, HIGGINS, KAVESH, MAHAN, and RENNER



is exercised in the case of only a few works, usually those which are held for study, later exhibition, or for the permanent college collection.

All work must be presented for evaluation. Those items which have been evaluated and which are not retained by the College become the property of the student.

The purpose of any college is to enable students to learn, and materials and equipment are provided to the student for the continuing advancement of his art and skills. If any student works for monetary gain or gears his work primarily to sales, he is abusing the facilities of the College.

CERAMIC ART

First Year			
<i>First Semester</i>	<i>credit hours</i>	<i>Second Semester</i>	<i>credit hours</i>
Design 131 (Visual Design I) . . .	3	Design 112 (Drawing)	4
Design 141 (Dimensional Design I)	4	Design 122 (Sculpture I)	3
Design 161 (Intro. to Art)	2	Design 162 (Intro. to Art)	2
Design 171 (Pottery)	2	Design 172 (Pottery)	2
Elective	3	Elective	3
English 101 (Composition)	3	English 102 (Composition)	3
P.E. 101 or M.S. 111	1	P.E. 102 or M.S. 112	1
			18

Second Year			
<i>First Semester</i>	<i>credit hours</i>	<i>Second Semester</i>	<i>credit hours</i>
Design 211 (Painting I)	3	Design 232 (Visual Design II)	3
Design 221 (Sculpture II)	3	Design 242 (Dimensional Des.)	3
Design 261 (Modern Art I)	2	Design 262 (Modern Art II)	2
Design 271 (Pottery)	2	Design 272 (Pottery)	2
Design 273 (Cer. Mat'ls.)	3	Design 274 (Glaze Calculations)	3
Geology*	3	Mathematics*	3
P.E. 203 or M.S. 221	1	P.E. 204 or M.S. 222	1
			17

*For Geology and Mathematics, see Adviser.

Third Year			
(17 hours each semester)			
<i>First Semester</i>	<i>credit hours</i>	<i>Second Semester</i>	<i>credit hours</i>
Design 311 (Painting II)	4 or 6	Design 312 (Painting II)	4 or 6
Design 321 (Sculpture III)	4 or 6	Design 322 (Sculpture III)	4 or 6
Design 331 (Graphics I)	4 or 6	Design 332 (Graphics I)	4 or 6
Design 333 (Photography I)	2	Design 334 (Photography)	2
Design 341 (Design III)	4 or 6	Design 342 (Design III)	4 or 6
Design 353 (Adv. Tech. Draw.)	2	Design 354 (Adv. Tech. Draw.)	2
**Art History	3	**Art History	3
Design 371 (Pottery III)	4 or 6	Design 372 (Pottery III)	4 or 6
Design 377 (Glass Forming)	4 or 6	Design 378 (Glass Forming)	4 or 6
Elective in Liberal Arts	4 or 6	Elective in Liberal Arts	4 or 6

Fourth Year			
(17 hours each semester)			
<i>First Semester</i>	<i>credit hours</i>	<i>Second Semester</i>	<i>credit hours</i>
Design 411 (Sculpture III)	4 or 10	Design 412 (Painting III)	4 or 10
Design 421 (Sculpture IV)	4 or 10	Design 422 (Sculpture IV)	4 or 10
Design 431 (Graphics II)	4 or 10	Design 432 (Graphics II)	4 or 10
Design 433 (Photography II)	2	Design 434 (Photography II)	2
Design 441 (Design IV)	4 or 10	Design 442 (Design IV)	4 or 10
Design 471 (Pottery IV)	4 or 10	Design 472 (Pottery IV)	4 or 10
Design 477 (Glass Forming)	4 or 10	Design 478 (Glass Forming)	4 or 10
*English 223	3	*English 224	3
Elective in Liberal Arts	4 or 10	Elective in Liberal Arts	4 or 10

*Required for graduation.
**Six elective hours required in the area. (DE 361 thru DE 370)



Graduate School

Graduate programs are offered in keeping with educational demands and with the potential of certain departments in the University to make distinctive contributions at an advanced level. The Graduate School coordinates and provides the desired unity for the graduate offerings in both the College of Liberal Arts and the State University of New York College of Ceramics.

The Departments of English, Mathematics and Psychology have programs leading to the Master of Arts degree. The course of graduate study in Psychology is a specialized program, devoted to the training of School Psychologists, and is registered with the New York State Department of Education. Students may receive certification in this area.

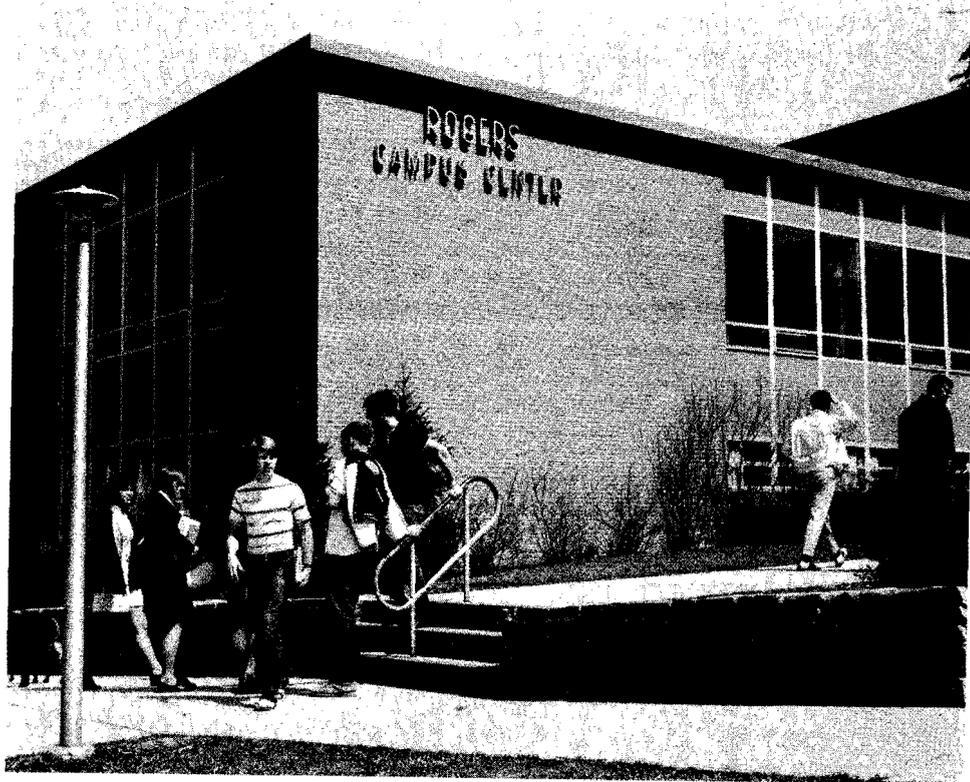
The Department of Education, in cooperation with several other departments, offers a number of programs leading to the Master of Science in Education degree, which are registered with the New York State Department of Education. These programs are designed for teachers in service or in preparation, or others who require advanced degrees or advanced study in order to obtain provisional or permanent certification (a) in teaching (b) in guidance and counseling, or (c) in administration and supervision.

Advanced undergraduate or graduate level work is available in the following departments: Art, Biology, Chemistry, Economics and Business Administration, English, Geology, History, Mathematics, Music, Political Science, Psychology, Sociology.

The Department of Ceramic Art offers a two-year program leading to the Master of Fine Arts degree. The Master of Science degree may be earned in Ceramic Engineering, Ceramic Science, or Glass Science in programs offered by the corresponding departments.

The College of Ceramics offers a program in Ceramics leading to the Doctor of Philosophy degree.

The specific graduate degree requirements, as well as detailed descriptions of courses and programs, are given in the catalog of the Graduate School. All inquiries about these programs and degrees should be directed to the Dean of the Graduate School.



Campus Life

Campus life has as its core, the academic program. From this core a variety of planned co-curricular activities develop, primarily in the areas of recreation and athletics, dramatics, music, and student government. In addition, there are other areas of activity such as cultural programs, departmental clubs and organizations, fraternities and sororities, which also serve to help each student to become a member of the University community.

ORIENTA- TION

Orientation week in September introduces the freshman student to the academic and social traditions of the University. During the orientation period the student begins to experience one of the most significant traditions: the friendly relationship between student and teacher. The program includes individual testing, becoming acquainted with fellow-students and Alfred activities, meeting with Deans and faculty advisers and registering for courses.

After the first day of class, orientation expands into a broader education. Formal instruction in the classroom is supplemented with individual conferences with teachers or with gatherings at faculty homes. Formally and informally, the students will find mature and friendly assistance ever-present.

STUDENT LIFE

Traditionally recognized as a "friendly campus in a friendly village," the College remains small enough to continue to express concern for the individual student. Seminars and classes are taught by fully qualified professional members of the faculty, who consider teaching and the continued search

for knowledge their primary responsibilities. There are many opportunities for student-faculty exchange of ideas on matter of mutual interest.

Life at Alfred however, is more than classrooms, laboratories and libraries, important as they are. The opportunity to develop special abilities and interest is an important part of college life. At Alfred, clubs and organizations offer the student numerous outlets for his talents. There are opportunities in music (University Singers, Wind Ensemble, R.O.T.C. Band, Orchestra), in publications (Alfred Review, newspaper, the Fiat Lux, yearbook-Kanakadea), and in other far-ranging avocations, from government (Student Senate) to drama (the Footlight Club.)

Opportunities for participation in healthful athletic activities go far beyond formal classes in physical education. Students are encouraged to take part in a full program of intramural sports and intercollegiate athletics.

Men's and women's intramural programs are open to those who wish to compete more or less for fun. Those who wish to challenge athletes from other colleges may chose to represent the Alfred Saxons in football, basketball, track, cross-country, lacrosse, soccer, golf, tennis, and rifle. Alfred University is a charter member of the Independent College Athletic Conference with Clarkson, Hobart, R.P.I., St. Lawrence and Union.

There are fraternities and sororities, honorary and service societies, including the national Blue Key for men, Keramos, National Professional Honorary Ceramic Engineering Society and Gold Key for women.

Film buffs have a chance to preview outstanding films and exercise their discretion in the selection of pictures to be shown to students and faculty. Young artists have frequent opportunities to display their work in the campus center.

The student who feels he does not have the specific skills of a public nature still has the opportunity to participate in various phases of campus life. An art exhibit is nothing without viewers; a dramatic performance would soon die without an audience. The complex learning process of today compels the serious student beyond the daily routine of classes, lectures, term papers and assignments. Learning comes from the interaction of ideas among students, from participation in clubs and organizations and from the experience of independent actions.

Cooperation in all phases of college life—hearing outstanding speakers, attending concerts and recitals, cheering at sports events, or engaging in the lively exchange of ideas—these are all part of the moving experience shared by all Alfredians.

General Information

COLLEGE YEAR

The college year consists of two semesters of about 17 weeks each. During the summer, there are three sessions totaling 12 weeks which provide opportunities for those who wish to accelerate their programs or make up deficiencies (See University Calendar).

REGISTRATION

All students will register on the days designated in the calendar. Any student who does not register at the appointed time in the regular college year will be charged a \$5.00 late registration fee. This late registration fee will also be charged for changes in courses selected if made at the student's request after the period regularly allowed for changes.

CLASS ATTENDANCE

Regular class attendance is required for all freshmen, sophomores, and students on condition. The individual faculty member may grant to all juniors, seniors, and special students in good academic standing permission to absent themselves from his classes.

It is understood that the individual instructor may revoke or deny this permission at any time.

It is also understood that all students are expected to attend Founders Day, Honors Convocation, and other all-University programs.

COUNSELING AND GUIDANCE

Although normal, successful progress in the studies undertaken is the responsibility of the individual student, the administration and faculty of the University are active in offering guidance and help. Each student has a faculty adviser and should feel free to consult, formally or informally, any University faculty or staff member who might be of assistance. A counseling office is maintained for specialized services concerning aptitudes, study problems, and other guidance questions.

The first week of the academic year is primarily devoted to orienting entering students to university life and to their scholastic work.

Students should give serious attention to post-college plans early in their college careers and should consult with the chairmen of the departments concerned, especially if these plans involve graduate study.

Courses are numbered as follows:

- 100-199 courses primarily for first-year students.
- 200-299 courses primarily for second-year students.
- 300-399 courses primarily for upperclassmen. Not regularly open to graduate students.
- 400-499 courses primarily for upperclassmen. May be taken for credit by graduate students.
- 500 and over graduate courses. May be taken by a senior if his adviser and the instructor approve.

Some 300 and 400 courses may be taken for credit by graduate students by special arrangements made in advance with the chairman of the department offering the course and the Dean of the Graduate School. When taken for graduate credit, the course number must be followed by the letter "G" entered at the time of registration. In many instances it will be quite appropriate for advanced undergraduate students to take 100 and 200 courses particularly in subjects outside their major area. *Note: The College of Ceramics uses the 300 and 400 numbers to designate courses of the third and fourth years respectively. Those 400-series courses which are starred may be taken for graduate credit.*

Hyphenated numbered courses (i.e., 101-102 or 105-106) are year courses subject to special regulations:

- (a) A student is expected to complete satisfactorily both semesters of the course (credit for one semester may be obtained only by special permission of the Chairman of the Department followed by the approval of the Dean).
- (b) An "F" grade for the first semester bars the student from enrolling for the second semester.
- (c) A student may not begin these courses in the second semester.

In addition to year courses, successive courses of one semester each may be listed together (i.e. 101 and 102 or 461 and 462) to express a desirable continuity without bringing to bear the year-course regulations.

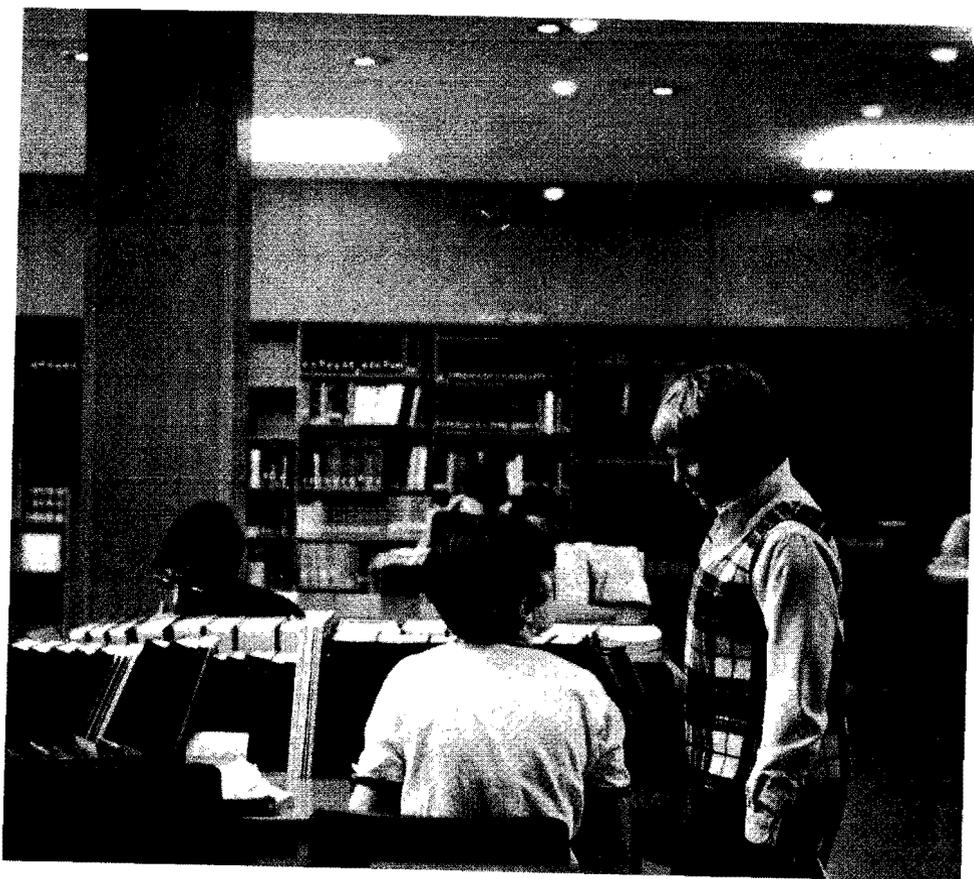
GRADES AND INDICES	<i>System of Grading.</i> The work of students in each course is graded as follows:	
A	superior	F failure
B+	very good	I incomplete
B	good	NR no report
C+	above average	P passing
C	average	WP withdrawn—passing
D+	below average	WF withdrawn—failing
D	poor	AU audit
		NC no credit

The withdrawal grades are used only if the student processes his withdrawal from a course prior to the dates published in the *Schedule of Courses and Directions for Registering*. Incomplete grades not made up within the succeeding semester will be recorded as F.

The lowest passing grade is D; however; a D earned in a course prerequisite to other courses will not permit the student to register in these courses. For example, a D in Mathematics 120 will give the student credit for the course, but he will not be permitted to register in any other course for which Mathematics 120 is a prerequisite. If the stated prerequisite is a year course (hyphenated), the average for both semesters must be at least D+.

Grading for graduate students is on a scale of A, B, C, or F. A graduate student must have an average of B or better in all courses to receive an advanced degree. When undergraduates enroll in a course primarily for graduates (500 and over) they will be graded on the same scale (A, B, C and F) and will receive point values of 4.0, 3.0, 2.0 or 0.0 in accordance with the table below.

Juniors and seniors who are in good academic standing will be permitted,



if they so desire, to designate one elective course each semester to be taken for a grade of "P" (pass) or "F" (fail), provided they have not been previously enrolled in the course. The designation of such a course must be approved by the student's major adviser in accordance with faculty-adopted regulations.

All grades remain on the student's permanent record. If a course is repeated and a higher grade is earned, its index replaces that of the former grade.

Note: A student wishing to take a summer school course elsewhere should obtain in advance written permission from his academic dean, especially if he wishes to be assured that the credit earned will be accepted by Alfred University. Requests for such permission should be accompanied by the printed course description from the catalog of the school the student wishes to attend.

Scholarship Indices. In the evaluation of scholarship the following system of point values (indices) is used:

Each semester hour at:

A	.....4.0 points	D+	.....1.5 points
B+	.....3.5 points	D	.....1.0 point
B	.....3.0 points	F	.....0.0 point
C+	.....2.5 points	WF	.....0.0 point
C	.....2.0 points	WP, I, NR, P, AU, NC	.....no point value

A student's index is obtained by dividing the total number of points by the total number of hours.

SEMESTER STANDARDS	First year, each semester	.....1.7
	Second year, each semester	.....2.0
	Third year, each semester	.....2.0
	First semester of fourth year	.....2.0

The student's year is determined as follows:

- Less than 2 full semesters in attendance—first year
 - 2 but less than 4 full semesters in attendance—second year
 - 4 but less than 6 full semesters in attendance—third year
 - 6 or more semesters in attendance—fourth year
- Two summer sessions will be counted as one semester

Such ranking will also be used to determine a student's eligibility to enroll in a course when the description specifies the year in college.

Honors, Prizes, and Awards

UNDERGRADUATE HONORS. A Dean's Honor List is published at the end of each semester. This list is composed of the names of full-time matriculated students who have a semester's scholarship index of at least 3.30, who have no college entrance condition, and who have no incomplete grades for the semester.

A Dean's Honor List is also published for the school year.

SENIOR HONORS. Three grades of honors are awarded, upon faculty approval, to seniors based on their cumulative scholarship attainment as evaluated upon completion of the requirements for the bachelor's degree, viz:

(a) *Summa cum laude*, or highest honors, to those having a scholarship index of 3.90 and no grade below B

(b) *Magna cum laude*, or high honors, to those having a scholarship index of 3.70 and no grade below C

(c) *Cum laude*, or honors, to those having a scholarship index of 3.30

DEPARTMENTAL HONORS. These honors may be awarded to seniors at the time of their graduation by the departments in which they have pursued their major studies. The specific requirements for these honors are determined by each department. The general requirements for all departments have been adopted by the faculty as follows:

A candidate for departmental honors shall have (1) attained a cumulative index of 3.30 in the courses of his major field, (2) earned at least two semester hours of credit in independent study, and (3) passed an oral examination in his major and allied fields, conducted by a committee selected by the major department. Candidates for departmental honors will be recommended by their respective departments and approved by the faculty.

Several scholarships and fellowships sponsored by industry are awarded to students of the College of Ceramics for outstanding accomplishment. The number of awards varies from year to year. During the 1968-69 school year, the following awards were made: the Aluminum Company of America, two for \$750; Pennsylvania Glass Sand Corporation Scholarship, \$600; Ferro Corp. Scholarships, two for \$300; Champion Spark Plug Co. Scholarship, \$600; General Refractories Co. Scholarship, \$250; Industrial Minerals of Canada, \$500 per year for three years; Western New York Section of the American Ceramic Society, \$200; Transelco Scholarship, \$100; and the Scholes Award (Ceramic Association of New York), \$100.

The Mary Goff Crawford Student Personal Library Award. This award has been established by Dr. and Mrs. Finla G. Crawford of Andover, New York, in memory of his mother who was a student at Alfred University from 1878-1880. The income of this fund will be given annually to seniors and freshmen who enroll in competition for three annual prizes by entering their personal libraries. The senior possessing the best personal library will receive a \$50.00 award. Prizes of \$15.00 will be given to the second place senior and the freshman having the best personal book collection. The student library will be judged by an Award Committee composed of the Chairman of the Faculty Library Committee and two faculty members appointed annually to serve as judges. Committee decision will be based on breadth of the general collection or merit as special collection of works by a single writer, or first editions, or books related to the student's discipline, or some other special category. The library must consist of at least 35 books, owned by the student and in his possession at the University, and accessible to the committee for inspection.

The Mary Wager Fisher Literary Prize. William Righter Fisher, Esq., of Philadelphia, contributed \$1000 to found in perpetuity a literary prize at Alfred University in memory of his late wife, Mary Wager Fisher, of the Class of 1863. The income of this fund will be given annually to one or more students as a prize for excellence in literary composition. The Chairman of the Department of English is chairman of the committee of award.

Hitchcock Research Prize: This award was established by Dr. and Mrs. Daniel Sass in memory of Raymond Hitchcock, M.D., a well-loved local physician. The prize of \$35.00 is presented to an undergraduate student judged to have conducted the best piece of research in the experimental sciences. Originality, organization, experimental technique, and clarity of presentation of results are the factors considered in evaluating the works submitted. The selection of prize winners is made through the Sigma Xi Club of Alfred University.

The Major Edward Holmes Award. A prize of \$75 is awarded to the student in the College of Ceramics who is selected by a faculty committee as winner of the local student speaking contest sponsored by the American Ceramic Society. The award is made by the Ceramic Association of New York.

Brenda Johnson Memorial Award. This award, in the amount of \$50, is made annually to the outstanding senior organ student. It is supported by a fund established in memory of Brenda Carol Johnson, a 1960 graduate of Alfred University.

Michael Levins Memorial Award. This award has been established by the parents of Michael C. Levins. Michael C. Levins was accepted for admission as a member of the freshman class of 1963. His untimely death occurred before

he was able to enroll in Alfred. The \$500 scholarship sponsored by his parents and the Reward Ceramic Color Manufacturers Inc. of Elkridge, Maryland will be presented each year to a student in the junior class of ceramic art who has demonstrated outstanding ability and potential in that field.

W. Varick Nevins III Prize in Mathematics. This award was established by the family and friends of W. Varick Nevins III, member of the Class of 1932, faculty member at Alfred from 1937 to 1967. This award will be presented to an undergraduate for excellence in Mathematics. The Chairman of the Department of Mathematics is chairman of the committee of award.

Natasha Goldowski Renner Prize in Physics. This award, established in memory of Dr. Natasha Goldowski Renner, assistant professor of Physics from 1956 to 1962, is presented to that student in the College of Liberal Arts who has shown excellence and promise in the study of physics.

The Howard Jon Schnabolk Memorial Award. To recognize and to encourage diligent student creativity in the performing and productive arts that comprise the ensemble of theater, an annual award has been established in memory of Lt. Howard Jon Schnabolk, '65, former theater Lighting Director, Past President of the Alfred University Footlight Club and Chairman of its Executive Committee, who lost his life in Viet Nam on the third of August, 1967, at the age of twenty-three.

The Special Refractories Award. The award was established with funds contributed by the former Special Refractories Association to assist worthy students in the field of ceramics.

The Tau Delta Phi Scholarship Medal. The Tau Delta Phi social fraternity annually awards this scholarship medal to the University student who has earned the highest cumulative scholarship index in three and one-half years of study.

Academically outstanding freshmen women may be elected to either of the national honorary societies, Alpha Lambda Delta or Cwens. In liberal arts the top upperclass students may be elected to Eta Mu Alpha. Keramos is the national honorary ceramic engineering fraternity to which outstanding engineering students may be elected.

CONDITION, SUSPENSION, DISMISSAL

A student whose index at the end of any semester falls below the minimum semester standard will be placed "on condition." Further, a student who has a low cumulative index, or low grades in critical prerequisite courses, may also be placed "on condition." A student "on condition" may, or may not, be permitted to participate in certain co-curricular activities or to carry a full curricular load.

The students "on condition" are urged to take full advantage of all University advisory sources available to them.

A student "on condition" who fails to attain the required semester index or fails to meet other specified academic requirements may be suspended for one or two semesters. However, any student "on condition" who is unable or unwilling to improve his academic standing significantly will be dismissed.

A student suspended for academic reasons may be granted the opportunity to return on a conditional basis. Application for readmission must be in writing to the Registrar who will forward the application and transcript material to the appropriate readmission committee. These applications should not be submitted until two months prior to the time the student is eligible to return.

The University reserves the right to require withdrawal of any student at any time for any reason deemed sufficient by the student conduct committee or similar group after an adequate hearing.

Students "on condition" or "on extended condition" will lose the privilege of having a car on campus. Only commuters are exempt from this ruling.

WITHDRAWAL

A student who is obliged for any reason to withdraw from the University during the academic year will first consult with the Dean of Students or the Associate Dean of Students. Students who plan to withdraw at the end of either semester are also required to consult with the Dean of Students or Associate Dean of Students. Initiating withdrawal in this manner is primarily for proper guidance but is also necessary if the student is to receive refunds that are due. A student who withdraws during the summer must notify the Dean of Students or the Associate Dean of Students on or before July 1 if his \$50.00 advance deposit is to be refunded.

General University Regulations

Attendance at Alfred University is a privilege and not a right. The University reserves the right, and the student concedes to the University the right, to require withdrawal of any student at any time for any reason deemed sufficient by the Student Conduct Committee or similar group after an adequate hearing. The University has the authority to enforce its social regulations at any time while the student is on the campus or within the village.

1. Alfred University students are expected to conduct themselves at all times in a mature and responsible manner.
2. The University reserves the right to cancel any course if registration for it does not justify continuance.
3. The University also reserves the right at any time to make changes deemed advisable in the rules and regulations and in the tuition and fees.
4. The University reserves the right to assign housing. Students may reside only in residences that have University approval, and students must comply with all parietal rules established for housing in University owned or approved buildings.
5. Campus parking is restricted Monday through Friday, 7 a.m. to 6 p.m. Resident freshmen may *not* have motor vehicles of any kind on campus or in the village of Alfred during their freshman year. Permitted student motor vehicles must be registered with the Superintendent of Buildings and Grounds at the time of registration for classes or as soon as the vehicle is brought to Alfred. Registration is for the academic year or remaining portion thereof. Commuters from outside the village and students living in University dormitories will be assigned certain parking areas and pay a fee of \$10 per year. There is no charge for students living off campus in the village who have no parking privileges but must attach stickers to their vehicles. However, for a \$10 fee such students may purchase commuter parking privileges. No student may drive to classes unless physically handicapped and so certified.

Penalties include a \$25 fine for failure to register and attach the stickers, a \$25 fine for parking a nonpermitted vehicle on campus and a \$5 fine for parking a permitted vehicle in the wrong area.

6. Hazing in any form is prohibited by the University and the laws of New York State.
7. Regular class attendance is required of all freshmen, sophomores, and students on condition. The individual faculty member may grant (or revoke at any time) permission to all juniors, seniors, and special students to absent themselves from his classes.

Alphabetical Listing of Courses

8. A student who is obliged for any reason to withdraw from the University during the academic year will first consult with the Dean of Students or the Associate Dean of Students. Students who plan to withdraw at the end of either semester are required to consult with the Dean of Students or Associate Dean of Students. Initiating the withdrawal in this manner is primarily for proper guidance but is also necessary if the student is to receive refunds that are due. A student who withdraws during the summer must notify the Dean of Students or the Associate Dean of Students on or before July 1 if the \$50 advance deposit is to be refunded.
9. Students are required to meet all financial obligations to the University when due. No student will be graduated or receive a transcript or grade report if he is delinquent in meeting financial obligations due the University or any University organization. At the discretion of the Dean of Students, this regulation may be applied to any financial obligation due non-university individuals or organizations.
10. Students are required to deposit their personal weapons in the R.O.T.C. storage room on arrival. A weapon card will be issued, and the student may then check out his weapons and ammunition by substituting his weapons card on the rack holding the weapon.

Courses bearing numbers preceded by capital letters are taught in the College of Ceramics.

BIOLOGY

101-102. GENERAL BIOLOGY

each semester 4 hrs.

A survey of the structural features, development, inheritance, evolution and interrelationships of plants and animals. Emphasis will be given to the underlying principles that have emerged during the development of biology as a science. Laboratory work will stress the importance of observation and experiment in the formulation of these unifying generalizations. Two lectures, two laboratory periods, one discussion section.

114. MAMMALIAN ANATOMY

3 hrs.

A study of mammalian anatomy with emphasis on nonprimates but with consideration of and reference to the human. Prerequisites Biology 101-102 or permission of the instructor. Two lectures and one three-hour laboratory period.

116. MICROBIOLOGY

3 hrs.

A survey of microbiological principles as illustrated by the bacteria, yeasts, molds, and protozoa. Required of first-year nursing students. Two lectures and one laboratory period.

224. MAMMALIAN PHYSIOLOGY

3 hrs.

The fundamentals of animal physiology with emphasis on the function of tissues, organs, and systems as illustrated by mammals including man. Prerequisites Biology 114 and General Chemistry.

311. INVERTEBRATE ZOOLOGY

4 hrs.

A study of invertebrate animals and animal groups selected to illustrate fundamental principles of animal biology through intensive study of a limited number of forms. Two lectures and two laboratory periods. Prerequisite Biology 101-102.

322. BOTANY

4 hrs.

A systematic study of the plant kingdom including the structure and life histories of representative plant groups and modern classification. Laboratory and field work will emphasize comparative morphology, identification, reproductive cycles and ecological relationships. Prerequisite Biology 101-102. Two lectures and two laboratory periods.

Courses shown here are taught predominantly in the College of Ceramics. Courses in physics, mathematics, the humanities and other areas are taught in the College of Liberal Arts and are described in the Alfred University catalog.

CERAMIC ART

FA 101-102. INTRODUCTION TO ART HISTORY
each semester 3 hrs.

A survey of the changing forms of architecture, painting, and sculpture in the context of cultural history, social environment and patronage. Special emphasis is placed on the origins of modern art. For majors in fine arts, a prerequisite to DE 261-262.

FA 111 and 112. PAINTING AND DRAWING
each semester 2 hrs.

A general course for beginners consisting of informal lectures, demonstrations, studio practice in drawing and painting from life, still life, and landscape. Laboratory work in the College of Ceramics.

FA 121 and 122. SCULPTURE
each semester 2 hrs.

Elements of three-dimensional composition using clay and other media. Organization of forms, space, and volumes, as the basis of creative sculpture. Laboratory work in the College of Ceramics.

FA 131 and 132. VISUAL DESIGN
each semester 2 hr.

A study of the basic vocabulary of design: point, line, texture, value, color. Creative exercises in graphic techniques. Laboratory work in the College of Ceramics.

FA 141 and 142. DIMENSIONAL DESIGN
each semester 2 hrs.

Exercises in three-dimensional design us-

ing a variety of materials. The student designs and constructs simple hand tools and utensils. Construction drawing. Laboratory work in the College of Ceramics.

FA 161-162. INTRODUCTION TO ART
each semester 3 hrs.

A survey of the changing forms of architecture, painting, and sculpture in the historical context of cultural ideals, social environment and patronage to the beginning of the Modern Period, c. 1789. This course is a requirement for the Bachelor of Fine Arts degree and for Liberal Arts majors in fine arts. Three lectures.

FA 171 and 172. INTRODUCTION TO POTTERY
each semester 2 hrs.

Work with the potters wheel as a foundation for the development of skills in forming.

FA 465-466. COLLOQUIUM IN RENAISSANCE STUDIES
each semester 3 hrs.

A colloquium which may be devoted to aspects of Renaissance Historiography, history, philosophy, literature, church history and the fine arts. Specific subject announced annually. Student may take more than once for credit. Permission of instructor required to enroll.

FA 467-468. CROSS CURRENTS IN THE HISTORY OF ART: THE ART OF FANTASY
each semester 3 hrs.

A conceptual survey of art as an expres-

sion of fantasy, ranging from Roman wall painting to Surrealism.

DE 112. DRAWING 4 hrs.
Free-hand drawing and design from still life, landscape, the figure and memory; all media used. Introductory work in color. Eight clock hours per week.

DE 122. SCULPTURE I 3 hrs.
Exercises and creative experiments aimed at uncovering the structural and plastic limits and potentials of clay. Eight clock hours per week.

DE 131. VISUAL DESIGN I 3 hrs.
A study of the basic vocabulary of two-dimensional design: point, line, texture, value and color. Application of this vocabulary in drawing and elementary design problems leading to an understanding of two-dimensional form and space. Eight clock hours per week.

DE 141. DIMENSIONAL DESIGN I 4 hrs.
Exercises in three-dimensional design using a variety of materials. The student designs and constructs simple hand tools and utensils. Construction drawing. Eight clock hours per week.

DE 161-162. INTRODUCTION TO ART
each semester 2 hrs.
A survey of the changing forms of architecture, painting, and sculpture in the historical context of cultural ideals, social environment and patronage to the beginning of the Modern Period, c. 1789. This course is a requirement for the Bachelor of Fine Arts degree and for Liberal Arts majors in fine arts. Three lectures.

DE 171-172. INTRODUCTION TO POTTERY
each semester 2 hrs.
Work with the potters wheel as a foun-

ation for the development of skills in forming.

DE 211. PAINTING I 3 hrs.
Plastic drawing and spatial organization, from still life, and landscape. All media used. Eight clock hours per week.

DE 221. SCULPTURE II 3 hrs.
Studies in recognition of the sculptural idea and the sources of visual energy in the sculptural statement. Modelled and constructed work in clay. Eight clock hours per week.

DE 232. VISUAL DESIGN II 3 hrs.
Continuation of 131. Introduction to typography, photomontage, and related exercises in drawing. The planning and organization of exhibitions. Eight clock hours per week.

DE 242. DIMENSIONAL DESIGN II 3 hrs.
The development of special knowledge and skills necessary to the solution of design problems. The study of structure. Design of small objects in wood, metal, glass, and other materials. The preparation of sections, profiles and models. Eight clock hours per week.

DE 261. MODERN ART I 2 hrs.
Art from the French Revolution to the First World War. Required for graduation. (Elective for Liberal Arts students.) Two lectures.

DE 262. MODERN ART II 2 hrs.
Art from World War I to the present. Required for graduation. Prerequisite De 261 or permission of instructor. (Elective for Liberal Arts students.) Two lectures.

DE 271-272. POTTERY-FORMING
each semester 2 hrs.
Advanced techniques. Thrown and pressed ware.

DE 273. CERAMIC MATERIALS
3 hrs.

A general course in ceramic raw materials. The origin and properties of clays and other materials used in pottery bodies. Laboratory exercises involving the use and properties of materials and development of pottery body compositions. Two lecture periods and one laboratory period.

DE 274. GLAZE CALCULATIONS
3 hrs.

A study of the composition properties and uses of materials used in glazes. Calculation of glaze formulas and batches. Laboratory exercises in the development of color and texture. Two lecture periods and one laboratory period.

DE 311-312. PAINTING II
each semester 4 or 6 hrs.

Creative organization of pattern, color, texture, and form in relation to a two-dimensional surface, decorative pattern for various materials and processes. All types of media used in this course.

DE 321-322. SCULPTURE III
each semester 4 or 6 hrs.

Self-determined sculpture problems correlated with Course 371 (Clay Forming). Area of concentration includes architectural ceramic applications and functions.

DE 331-332. GRAPHICS I
each semester 4 or 6 hrs.

General survey of graphic methods. Introduction to elementary printing methods: stencil, type, monoprint. Investigation of the woodcut as a creative medium.

DE 333-334. PHOTOGRAPHY I
each semester 2 hrs.

An introduction to the basic elements of photography. Fundamental camera and darkroom techniques will be studied. Em-

phasis is on photography as an interpretative medium. Enrollment is limited to ten students.

DE 341-342. DIMENSIONAL
DESIGN III
each semester 4 or 6 hrs.

Basic problems in design, stressing the influence of function, materials, methods of making, social and economic factors; problems in interior arrangement, furniture models and constructions. Selected problems are produced, full scale, in the final materials.

DE 353-354. ADVANCED
TECHNICAL DRAWING
each semester 2 hrs.

A course in advanced perspective and architectural drawing tailored to the needs of the individual student. Additional credit by arrangement with instructor.

DE 361-362. CLASSICAL ART
each semester 3 hrs.

A detailed study of certain aspects of Greek or Roman Art and Architecture. Three lectures.

DE 363-364. MEDIEVAL ART
each semester 3 hrs.

From the rise of Christianity to the fall of Constantinople, embracing certain aspects of the Art and Architecture of the Early Christian and Byzantine Empire, or Romanesque and Gothic periods in Western Art. Three lectures.

DE 365-366. RENAISSANCE ART
each semester 3 hrs.

The Art and Architecture of Italy from c. 1400 to 1600 or Northern European Painting and Sculpture of c. 1400 to 1600. Three lectures.

DE 367-368. ORIENTAL ART
each semester 3 hrs.

The Art and Architecture of China,

Japan and the Indian East, or the Art of the Ancient Near East: Islamic Art and Architecture. Three lectures.

DE 369-370. HISTORY OF POTTERY
each semester 3 hrs.

A survey of pottery styles of the great cultures including the history of body and glaze materials, forming, kilns and decorative styles. Problems of evaluation will also be considered. Three lectures.

DE 371-372. POTTERY III-
FORMING
4 or 6 hrs.

A general course in pottery design and production. Creative use of clays and glazes; ceramic colors and textures. Molds and models. Firing practice.

DE 377-378. GLASS FORMING
4 or 6 hrs.

Basic studies in glass forming—offhand and mold processes.

DE 411-412. PAINTING III
each semester 4 or 10 hrs.

An advanced course in painting and drawing—all media used.

DE 421-422. SCULPTURE IV
each semester 4 or 10 hrs.

Advanced sculpture problems in the organization of ceramic elements and welded metal elements. Enrollment in this course is limited to six students.

DE 431-432. GRAPHICS II
each semester 4 or 10 hrs.

Advanced application of graphic methods learned in 331. Problems in visual design (book illustration, exhibition, the series) will be arranged individually with the student.

DE 433-434. PHOTOGRAPHY II
each semester 2 hrs.

Advanced work in photography. Four clock hours per week.

DE 441-442. DIMENSIONAL
DESIGN IV
each semester 4 or 10 hrs.

An advanced course in drawing and three dimensional design problems, planned individually with each student.

DE 450. INDEPENDENT STUDY

A course of independent study under direction of the art staff. Hours and credit to be arranged with the Chairman of the department.

DE 460. INDEPENDENT STUDY IN
HISTORY OF ART

For majors in art history. Hours arranged with instructor.

DE 461-462. HISTORY OF AMERICAN
ART AND ARCHITECTURE
each semester 3 hrs.

Discussion and lectures in American studies of role and development of American art, architecture and taste. Three lectures.

DE 463-464. BAROQUE ART AND
ARCHITECTURE
each semester 3 hrs.

Discussion and lectures in Italian art, architecture and art theory, or the Baroque Period in Northern European art, architecture and art theory. Three lectures.

DE 465-466. HISTORY OF ARCHITECTURE
each semester 3 hrs.

Aspects of history of architecture: European, American or Oriental. Three lectures.

DE 467-468. MODERN ART
each semester 3 hrs.

Foundations and influences of the Cubist movement in modern painting: lecture and discussion of background to and history of the Cubist movement in Art. Three lectures.

DE 469. THE CONTEMPORARY
MOVEMENT: ART SINCE 1945
each semester 3 hrs.

Study of various aspects of the history
of the arts and their critics since 1945.
Three lectures.

DE 471-472. POTTERY
each semester 4 or 10 hrs.

Problems in the design of pottery, table-
ware, and glass products. Individual prob-
lems including various methods of form-
ing and types of market requirements;
survey of history of ceramics.

DE 477-478. ADVANCED STUDIES
IN GLASS FORMING
each semester 4 or 10 hrs.

DE 480. ART METHODS AND
MATERIALS 4 hrs.

A laboratory and study course preparing
those students interested in teacher cer-
tification for the following semester's prac-
tice teaching.

CERAMIC ENGINEERING

CE 101. A STUDY OF THE
CERAMIC INDUSTRIES 1 hr.

A survey of the ceramic industry in-
tended to develop a familiarity with prod-
ucts, operations, processes and terminol-
ogy as a background for subsequent
courses. One lecture per week.

CE 102. A STUDY OF THE
CERAMIC INDUSTRIES 1 hr.
One lecture per week.

CE 103. CERAMIC LABORATORY
1 hr.

A laboratory designed to give the student
a familiarity with fabrication techniques.
Nine experiments with reports required.
One laboratory per week.

DE 550. INDEPENDENT STUDY

DE 561-562. THEORIES OF ART

DE 571-572. ADVANCED POTTERY

DE 575. ADVANCED CERAMIC MA-
TERIALS AND CALCULATIONS

DE 576. KILN DESIGN

DE 577-578. RAW MATERIALS
TESTING AND RESEARCH

DE 661-662. GRADUATE SEMINAR

DE 650. GRADUATE THESIS

DE 671-672. ADVANCED POTTERY

DE 673-674. GRADUATE PROJECT

DE 673A. DESIGN-PROFESSIONAL
PRACTICE

DE 6745. GRADUATE PROJECT

CE 104. CERAMIC LABORATORY
1 hr.

A continuation of CE 103 laboratory with
more involved and more quantitative ex-
periments. Five experiments with reports
required.

CE 106. COMPUTER TECHNIQUES
2 hrs.

An introduction to computer language
(Fortran) and program writing. Two lec-
tures per week.

CE 203-204. CERAMIC
LABORATORY 1 hr.

Laboratory experiments of a quantitative
nature designed to demonstrate certain
fundamental principles involved in the

behavior of ceramic materials and prod-
ucts. Seven experiments with reports
required.

CE 205. MATERIALS 3 hrs.

A comprehensive survey of the raw ma-
terials used to fabricate ceramic bodies
is made. The elementary principles of
crystal chemistry are applied to the de-
scription of raw materials. Calculations
of batches and bodies for many types of
ceramic products are made. Three lec-
tures. Offered first semester.

CE 206. OPERATIONAL
TECHNIQUES 3 hrs.

Introduction to techniques employed in
ceramic and glass operations including
materials handling, forming, drying, fir-
ing and economic considerations. Three
lectures per week.

CE 305. CERAMIC LABORATORY
1 hr.

Quantitative experiments designed to il-
lustrate various techniques involved in
clay testing and the relationship to be-
havior in use. Six experiments with re-
quired reports.

CE 306. CERAMIC LABORATORY
1 hr.

Precise quantitative experiments dealing
with properties of ceramic materials. Five
experiments with required reports.

CE 327. CRYSTAL CHEMISTRY
3 hrs.

Introduction to atomic structure, coordi-
nation theory, types of bonding and their
relationship to properties of silicates and
glasses. Three lectures per week.

CE 332. TRANSPORT PROPERTIES
3 hrs.

The principles of momentum, energy,
and mass transport, and their application
to engineering problems. Three lectures

per week. Prerequisites Physics 115-116
and Math 219-220.

CE 352. ENGINEERING MANAGE-
MENT (Humanities Elective) 3 hrs.

Common problems encountered by chem-
ical and ceramic graduates in industry
are discussed. The principles of industrial
research, new product development, se-
lection of research projects, and market
analyses are covered. Procedures related
to patents, technical information sources,
corporate acquisition programs, foreign
operations, cost planning, and sales are
described. Three lectures. Offered second
semester.

CE 371. SEMINAR

*CE 403. PHYSICAL CERAMICS
4 hrs.

A study of the physical-chemical princi-
ples of those high temperature mech-
anisms that influence the firing of ceram-
ics. Topics include structural imperfec-
tions, surface effects, diffusion, nuclea-
tion, crystal growth, sintering, vitrifica-
tion, non-equilibrium reactions and na-
ture of representative microstructures.
Four lectures per week.

*CE 404. PROPERTIES OF
CERAMICS 4 hrs.

The study of the properties of the ceram-
ic structures that are developed in CE
403. Included are thermal, optical, me-
chanical, electrical and magnetic prop-
erties. Four lectures per week.

CE 405. INDUSTRIAL
INVOLVEMENT 2 hrs.

The student collaborates with an indus-
try to undertake a realistic and complete
engineering project. These projects are
unsolved problems from current technol-
ogy including conception, design, testing,
development, construction and evalua-
tion.

*May be taken for graduate credit.

CE 406. CERAMIC LABORATORY
2 hrs.

Continuation of CE 405.

*CE 408. STRUCTURAL CLAY
PRODUCTS (Ceramic Elective)
2 hrs.

Specialization in the technology and the engineering aspects of the structural clay products industry. Two lectures per week.

*CE 409. WHITEWARES (Ceramic
Elective) 3 hrs.

A study of bodies, glazes and colors. A specialized course dealing with white-ware production, control and properties. Three lectures per week.

*CE 414. REFRACTORIES (Ceramic
Elective) 3 hrs.

A study of the fundamental technology of all refractories and the engineering aspects of their production and use. Three lectures per week. Prerequisite CE 205.

*CE 415. LIME, GYPSUM, AND
CEMENT (Ceramic Elective) 3 hrs.

The properties, manufacture, testing, and uses of cementing materials with particular regard to basic principles. Three lectures. Offered first semester. Prerequisite CE 205.

*CE 418. ENAMELS (Ceramic
Elective) 2 hrs.

The technology of the application of vitreous enamels to metals. Two lectures.

CE 419. STRENGTH OF
MATERIALS 4 hrs.

A treatment of the mechanical properties of materials under various types of static stresses coordinated with the analysis of stresses and the design of simple machine and structural members. Four lectures per week. Prerequisite Physics 115-116.

*CE 423 and 424. ADVANCED
CERAMIC TECHNOLOGY
each semester 2 hrs.

The study of solid-state reactions, ion exchange, unequilibrium crystallization, etc., and their ceramic implications. Two lectures.

CE 431. OPERATIONS RESEARCH
3 hrs.

A consideration of the basic principles underlying linear programming, queuing theory, perturbation techniques, transportation, assignment, allocation, minimization, mesinization and decision theory. Three lectures per week. Prerequisite Math 220.

CE 435. ELECTRICAL
ENGINEERING 3 hrs.

Quantitative treatment of d-c, a-c circuits, vacuum and semi-conductor devices, power supplies and filters, amplifiers, oscillators and power control. Two lectures, one laboratory per week. Prerequisites Physics 283, 285 and Math 219-220.

CE 437. PHYSICOCHEMICAL
EQUILIBRIUM 2 hrs.

Advanced study and interpretation of phase equilibria in binary, ternary, and quaternary systems, especially those involving oxides and silicates. Emphasis is given to application of equilibrium and nonequilibrium reactions to ceramic processes.

CE 450 and 550. INDEPENDENT
STUDY

CE 461-462. THESIS 2 hrs.

*CE 464. HIGH TEMPERATURE
HIGH STRESS MATERIALS 3 hrs.

Atomistic consideration of the mechanical behavior of materials. Raw materials, fabrication, firing, properties of cermets,

intermetallas and oxide ceramics for use in high temperature-high stress applications. Three lectures per week.

CE 471. SEMINAR

CE 474. PLANT DESIGN 3 hrs.

The engineering features of plant layout and design are considered. These include overall design, preparation of plant layout, data collection, development and layout evaluation, materials handling, storage, employee relationship and other common problems. Three lectures, one laboratory.

CE 503. LINEAR PROGRAMMING
3 hrs.

CE 517 and 518. GRADUATE
SEMINAR

CERAMIC SCIENCE

*EM 412. ELECTRON MICROSCOPY
3 hrs.

Operation of the electron microscope for optical and electron diffraction studies. Applications and specimen preparation techniques. Two lectures and two laboratory periods. Offered second semester.

*MET 438. INTRODUCTION TO
PHYSICAL METALLURGY 3 hrs.

A survey of basic principles such as structure of metals, metallography, phase diagrams, physical properties, annealing, powder metallurgy, age hardening, heat treatment, and oxidation. Three lectures. Offered both semesters. Prerequisites Physics 112 and MIN 201.

*MET 439 PHYSICAL
METALLURGY 3 hrs.

Study in greater depth than in MET 438 of selected areas from that course. Two lectures and one laboratory period. Offered first semester. Prerequisite MET 438.

CE 544. GRADUATE CERAMICS

CE 564. MECHANICS OF
COMPOSITE MATERIALS 3 hrs.

GT 650. GRADUATE THESIS

EG 101. ENGINEERING GRAPHICS
3 hrs.

The fundamental principles of drafting, descriptive geometry, and graphical presentations are studied both freehand and with instruments.

EG 313 and 314. ADVANCED
DRAFTING
each semester 2 hrs.

Technical or architectural drawing. Prerequisite EG 101-102.

*MET 440. MECHANICAL
METALLURGY 3 hrs.

Stress and strain, elastic and plastic behavior of metals. Plastic deformation of single crystals and polycrystalline aggregates of metals. Slip, twinning, and strain hardening are covered. Strengthening mechanisms. Applications of testing of metals. Two lectures and one laboratory period. Offered second semester. Prerequisite MET 438.

MIN 201. MINERALOGY 3 hrs.
Introduction to crystallography and crystal chemistry and the study of minerals and their concentration and identification by chemical and physical methods. Two lectures and one laboratory period.

PET 302. PETROGRAPHY 3 hrs.
Petrographic microscopy, including optical mineralogy; linear, point, and counting methods for quantitative analysis of

*May be taken for graduate credit.

mineral mixtures; particle size distribution; thin sections, polished sections, and immersed grains. Two lectures and one laboratory period. Offered second semester.

***PET 401. ADVANCED PETROGRAPHY**

Advanced work in the use of the petrographic and metallographic microscopes and accessories in the examination and photography of certain raw materials and products. One laboratory period. Offered first semester. Prerequisite PET 302.

***X-RAYS 411. APPLIED X-RAYS**
3 hrs.
Basic x-ray physics, x-ray crystallog-

CHEMISTRY

103. BASIC CHEMISTRY 4 hrs.
The fundamental principles of chemistry with applications to nursing. Two lectures, one quiz, and one two-hour laboratory period. Breakage deposit \$5.00.

105-106. GENERAL INORGANIC CHEMISTRY
each semester 4 hrs.

A systematic study of fundamental principles, theories, and calculations. Preferably for students who have had a year of high-school chemistry. Laboratory work in the second semester includes an introductory study of inorganic qualitative analysis. Required of pre-medical, pre-dental, and chemistry major students as well as majors in ceramic engineering, ceramic science and glass science. Two lectures, one quiz, and two laboratory periods. Breakage deposit \$5.00 each year.

CH 215. ANALYTICAL CHEMISTRY
4 hrs.
Introduction to the principles of inor-

raphy, and applications of x-ray diffraction to the study of solids. Applications include powder methods, single crystal methods, and an introduction to crystal structure analysis. Two lectures, one laboratory.

***X-RAYS 412. X-RAY CRYSTALLOGRAPHY** 3 hrs.

Topics of study will include space group symmetry, equipment sets, relation of crystal form and physical properties to symmetry. Laue, Weissenberg, precession, and other experimental methods for obtaining crystal information will be studied and used. Diffraction intensities and structure analyses will be made. Two lectures, one laboratory.

ganic chemical analysis. Mathematics of chemical stoichiometry, equilibrium constants, solubility product, and pH are stressed. Laboratory consists of major group separations, the semi-micro preparation of inorganic compounds, the study of their behaviors, and estimation of cations and anions. Two lectures, two laboratory periods. Prerequisite 105-106.

CH 244. INTRODUCTION TO PHYSICAL CHEMISTRY 3 hrs.

An introduction to the first two laws of classical thermodynamics stressing principles and parameter analysis. Topics covered include ideal and real gases, the first and second law, work, heat capacity, thermochemistry, Carnot engines, qualitative wave mechanics, and molecular orbital diagrams. Three lectures. Second semester. Prerequisite MA 120.

CH 324^c. ANALYTICAL CHEMISTRY LABORATORY 3 hrs.

The application of analytical schemes, ion-exchange techniques, chromatogra-

phy, colorimetry and electrochemistry to the analysis of various materials. Recommended for chemistry majors. One lecture and two laboratory periods. Breakage deposit \$15.00.

CH 334^c. ADVANCED INORGANIC LABORATORY 2 hrs.

Syntheses selected to provide experience in the techniques of preparation, purification, and analysis of typical compounds. Breakage deposit \$15.00.

CH 335. FUNDAMENTALS OF ORGANIC CHEMISTRY 3 hrs.

A summary course, emphasizing as much as possible, applications of carbon compounds in ceramics. Elective, for undergraduate credit. Prerequisite Chemistry 105-106. Two lectures.

CH 337. DESCRIPTIVE INORGANIC CHEMISTRY 3 hrs.

Course deals with the descriptive chemistry of the families of elements and classes of compounds of greatest ceramic interest. The methods of evaluation of the various chemical properties and techniques of prediction are discussed. The chemical consequences of the three different conditions, aqueous solution, melts, and solid-solid interaction are presented. Three lectures. Offered first semester.

CH 345. PHYSICAL CHEMISTRY 4 hrs.

Liquids and solutions, equilibrium theory, kinetics, electrochemistry, surface chemistry, and introduction to phase diagrams are covered. Three lectures, one laboratory. Prerequisite CH 244. Breakage deposit \$15.00.

CH 348. ADVANCED PHYSICAL CHEMISTRY 4 hrs.

An elaboration of topics covered in CH

^cGraduate students may apply the credit in these 300 courses to a program for the M.S.Ed. degree.

244 and CH 345 at a more advanced level is made. Some independent reading is encouraged. Three lectures, one laboratory. Prerequisite, CH 345. Breakage deposit \$15.00.

351-352^c. ORGANIC CHEMISTRY
each semester 4 hrs.

An introduction to the chemistry of carbon compounds including the preparation of a number of typical compounds and a study of their properties, reactions, and uses. The course is designed for those students who contemplate the study of chemistry, medicine, dentistry, and biology. Prerequisite Chemistry 105-106. Required of all pre-medical, pre-dental, and chemistry major students. Three lectures and one laboratory period. The first hour of the laboratory will be devoted to a recitation. Breakage deposit \$15.00 each year.

431-432. ADVANCED INORGANIC CHEMISTRY
each semester 3 hrs.

A study of the application of modern theoretical chemistry to the properties of inorganic substances. Chemical properties and reactions are studied and correlated with the structure of matter, chemical equilibrium, oxidation potentials, and the periodic system. This course is recommended for chemistry majors.

453. ORGANIC PREPARATIONS
1 or 2 hrs.

Preparations involving the principles encountered in synthetic work are studied in the performance of at least eight multi-step syntheses. Emphasis will be placed upon the introduction to the literature of the field of organic chemistry. Prerequisite Chemistry 351-352. Breakage deposit \$15.00.

455. QUALITATIVE ORGANIC ANALYSIS 3 hrs.

Text-book assignments and analyses of organic compounds and mixtures. Prerequisite Chemistry 351-352. One lecture and two laboratory periods. Breakage deposit \$15.00.

CH 477. ELEMENTARY SPECTROSCOPY 3 hrs.

Basic principles of spectroscopic instruments, including sources, dispersing elements and detectors in relation to the measurement of radiation wavelength and intensity. The origin of atomic and molecular spectra, spectral series and notation. Qualitative and quantitative analysis by emission spectroscopy. Techniques and applications of ultraviolet, visible and infrared absorption spectrophotometry. Two lectures and one laboratory period per week, first semester.

450 or 550. INDEPENDENT STUDY hours to be arranged

GLASS SCIENCE

GL 301. GLASS MANUFACTURE 5 hrs.

The glass melting process is studied in relation to refractories, containers, temperatures, and fining agents. Text and references to the literature of glass, covering glass composition, furnace design and operation, tank blocks and parts, and fundamental chemistry of glassmaking, working processes, annealing, finishing, defects and testing of commercial glassware. In the laboratory, experiments on melting and forming of various glasses, and on measurement of density, softness, annealing and strain points, chemical durability, stress optical constant, and other properties of glass will be carried out. With the permission of

CH 503. GENERAL PHYSICAL CHEMISTRY

CH 507. WAVE MECHANICS

CH 512. CHEMICAL KINETICS

CH 527. CRYSTAL CHEMISTRY

CH 529. INORGANIC CHEMISTRY

CH 574. APPLICATIONS OF GROUP THEORY

CH 576. STATISTICAL THERMODYNAMICS

CH 581. GENERAL SURFACE CHEMISTRY

CH 584. ADVANCED INORGANIC CHEMISTRY

CH 586. ORGANIC AND INORGANIC POLYMERS

the instructor, the lectures may be taken as a three-hour course without the laboratory. Three lectures, two laboratory periods. Offered first semester.

GL 302. PROPERTIES I 5 hrs.

The properties of glass are studied with particular attention to methods of measurement. Density, thermal expansion, viscosity, surface tension, and the stress-optical properties are covered. The calculation of properties from composition, annealing, measurement of strain and heat shock resistance are treated mathematically. Laboratory is a continuation of the laboratory of GL 301. Three lectures, two laboratories. To be taken with PET 302.

GL 351-352. LABORATORY each semester 2 hrs.

Experiments on melting various glass compositions and determination of properties of glass. Precision of measurement is emphasized.

GL 371-372. GLASS SEMINAR

GL 381-382. GLASS FORMING each semester 1 hr.

Practice in off hand blowing, pressing, mold blowing and semi automatic bottle manufacture.

*GL 403. PROPERTIES II 3 hrs.

Text, lectures, assigned reading, individual reports on research papers. The physical chemical, and optical properties of glass are intensively studied. Three lectures. Offered first semester.

GL 404. GLASS-MELTING UNITS 3 hrs.

Studies on the design, construction, and operation of glass furnaces. Thermal efficiency, heat economy, and application of electric energy are considered. Two lecture hours, one laboratory period.

*GL 406. STRUCTURE OF GLASS 2 hrs.

Three credit hours may be given for special assignment. Primarily for graduate students. A lecture course dealing with the coordination and linkage of cations and oxygen in the glass-forming, glass-modifying, and intermediate oxides, from the viewpoint of crystal chemistry. Two lectures. Offered second semester.

*GL 408. MATERIALS OF GLASS MANUFACTURE 3 hrs.

The properties, functions, thermal behavior, and applications of various ma-

*May be taken for graduate credit.

terials used in the manufacture of glass and ceramic products are considered from the concept of the glassy and crystalline states. Occurrence, evaluation, recovery, and beneficiation of the basic materials are studied. Particular emphasis is placed on the role of thermal behavior in glasses and glassy ceramics. Selection of proper materials is also emphasized. Methods of testing purity and avoidance of impurities are stressed. The chemical toxicity of various raw materials is pointed out, and methods of safe handling are recommended.

*GL 410. GLASS-METAL SEALS 2 hrs.

Special problems encountered in fabrication of glass-metal seals.

GL 461-462. GLASS THESIS each semester 2 hrs.

Laboratory study of a problem selected in conference with the department head. Review of literature. Two laboratory periods.

*GL 471-472. GLASS SEMINAR each semester 1 hr.

Talks on advances in the science and technology of glass and related fields of ceramics by invited speakers or by senior or graduate students. A written paper is required for graduate credit. Glass seminar is required for juniors, seniors, fifth year students, and graduate students registered in the Glass Department.

GL 450 or 550. INDEPENDENT STUDY

GT 650. GRADUATE THESIS hours to be arranged

GL 591. THE VITREOUS STATE 2 hrs.

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State University of New York

The State University of New York, established by the State Legislature in 1948, comprises 70 colleges and centers. At present, 67 conduct classes: four University Centers, two Medical Centers, 12 Colleges of Arts and Science, two Specialized Colleges, six two-year Agricultural and Technical Colleges, five Statutory Colleges, and 36 locally-sponsored, two-year Community Colleges.

Permanent campuses for two of the Colleges of Arts and Science are under construction, the College at Purchase in Westchester County and the College at Old Westbury in Nassau County. Old Westbury conducts classes on a limited enrollment basis in temporary quarters at Oyster Bay, Long Island. Special credit programs are conducted by Purchase, including joint operation of a Co-operative College Center in Mount Vernon. A third Arts and Science campus, upper-divisional in concept, will be located in the Herkimer-Rome-Utica area.

Three Upstate Community Colleges have moved from the planning stage into actual operation, admitting their first classes this September. They are Schenectady Community College, Clinton Community College, and Columbia-Greene Community College.

In New York City, the seventh Community College sponsored by the Board of Higher Education will open its doors in South Bronx in 1970. An eighth New York City community college is in the planning and development phase.

The University further comprises the Ranger School, a division of the College of Forestry, which offers a 43-week technical forestry program at Wanakena; the Center for International Studies and World Affairs at Albany; and five Urban Centers administered by Community Colleges.

University-wide research programs include the Atmospheric Sciences Research Center with campus headquarters at Albany, the Institute for Theoretical Physics and the Marine Sciences Research Center at Stony Brook, and the Water Resources and Polymer Research Centers at the College of Forestry. Two research facilities headquartered at State University of New York at Buffalo are the Western New York Nuclear Research Center and the Center for Immunology.

Graduate study at the doctoral level is offered by State University at 12 of its campuses, and graduate work at the master's level at 22. The University is continuing to broaden and expand over-all opportunities for advance degree study.

Graduate study areas embrace a wide spectrum including agriculture, business administration, criminal justice, dentistry, education, engineering, forestry, law, liberal arts and science, library science, medicine, nursing, pharmacy, social work, and veterinary medicine.

Four-year programs strongly emphasize the liberal arts and science and also include specializations in teacher education, business, radio and television, forestry, maritime service, ceramics, pre-law, and the fine and performing arts.

Two-year programs include nursing and liberal arts transfer programs and a wide variety of technical curriculums such as agriculture, business, and the industrial and medical technologies.

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Governed by a Board of Trustees appointed by the Governor, State University of New York comprises all State-supported institutions of higher education, with the exception of the senior colleges of City University of New York. Each college and center of State University is locally administered. Although separated geographically, all are united in the purpose of improving and extending numerous opportunities to the youth of New York State.

The State University motto is: "Let Each Become All He Is Capable of Being."

State University of New York

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State University at Albany
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MEDICAL CENTERS

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Upstate Medical Center at Syracuse

COLLEGES OF ARTS AND SCIENCE

College at Brockport College at Oneonta
College at Buffalo College at Oswego
College at Cortland College at Plattsburgh
College at Fredonia College at Potsdam
College at Geneseo *College at Purchase
College at New Paltz
*College at Old Westbury

*(Two Colleges of Arts and Science are under construction, at Purchase in Westchester County and at Old Westbury in Nassau County. Old Westbury is conducting classes in temporary quarters at Oyster Bay, Long Island, on a limited enrollment basis. Purchase carries out special credit programs, including joint operation of a cooperative College Center in Mt. Vernon. A third Arts and Science campus, upper divisional in nature, will be located in the Herkimer-Rome-Utica area.)

SPECIALIZED COLLEGES

College of Forestry at Syracuse University
Maritime College at Fort Schuyler (Bronx)

AGRICULTURAL AND TECHNICAL COLLEGES (Two-Year)

Alfred	Delhi
Canton	Farmingdale
Cobleskill	Morrisville

STATUTORY COLLEGES

College of Ceramics at Alfred University
College of Agriculture at Cornell University
College of Human Ecology at Cornell University
School of Industrial and Labor Relations at Cornell
Veterinary College at Cornell University

COMMUNITY COLLEGES

(Locally-sponsored, two-year colleges under the program of State University)
Adirondack Community College at Glens Falls
Auburn Community College at Auburn
Borough of Manhattan Community College

Bronx Community College
Broome Technical Community College at Binghamton
Clinton Community College at Plattsburgh
Columbia-Greene Community College at Athens
Community College of the Finger Lakes at Canandaigua
Corning Community College at Corning
Dutchess Community College at Poughkeepsie
Erie County Technical Institute at Buffalo
Fashion Institute of Technology at New York City
Fulton-Montgomery Community College at Johnstown
Genesee Community College at Batavia
Herkimer County Community College at Ilion
Hudson Valley Community College at Troy
Jamestown Community College at Jamestown
Jefferson Community College at Watertown
Kingsborough Community College
Mohawk Valley Community College at Utica
Monroe Community College at Rochester
Nassau Community College at Garden City
New York City City Community College of Applied Arts and Sciences
Niagara County Community College at Niagara Falls
North Country Community College at Saranac Lake
Onondaga Community College at Syracuse
Orange County Community College at Middletown
Queensborough Community College
Rockland Community College at Suffern
Schenectady Community College at Schenectady
Staten Island Community College
Suffolk County Community College at Selden
Sullivan County Community College at South Fallsburg
Tompkins-Cortland Community College at Groton
Ulster County Community College at Stone Ridge
Westchester Community College at Valhalla
(Two additional community colleges under the local sponsorship of the New York City Board of Higher Education have been approved by the State University Trustees. The Community College in Southeast Bronx will accept its first students in 1970. The second is under planning.)

ALFRED UNIVERSITY
ACADEMIC YEAR 1969-70

Calendar

FIRST SEMESTER 1969

Sept.	14-16	Sunday- Tuesday	Orientation Program for freshmen and transfer students
	15-17	Monday- Wednesday	Registration
	18	Thursday	Classes begin at 8 a.m.
	18	Thursday	Registration of part-time graduate students 5-8 p.m.
Oct.	7	Tuesday	Opening of College Convocation and Founders' Day
	10-12	Friday- Sunday	Homecoming
	24-26	Friday- Sunday	Fall Parents' Weekend (parents of freshmen and new transfer students)
Nov.	12	Wednesday	Mid-semester grades 12 noon
	26	Wednesday	Thanksgiving recess begins at 12 noon
Dec.	1	Monday	Classes resume at 8 a.m.
	19	Friday	Christmas recess begins at 12 noon
1970			
Jan.	5	Monday	Classes resume at 8 a.m.
	17	Saturday	Final examinations begin
	26	Monday	Registration of part-time graduate students (for second semester) 5-8 p.m.
	27	Tuesday	Final examinations and first semester end

SECOND SEMESTER

Feb.	4	Wednesday	Registration of new students
	5	Thursday	Classes begin at 8 a.m.
Mar.	13	Friday	St. Patrick's Festival (half-holiday)
	25	Wednesday	Mid-semester grades 12 noon
	26	Thursday	Spring recess begins at 12 noon
Apr.	6	Monday	Classes resume at 8 a.m.
	23	Thursday	Honors Convocation
	30	Thursday	Moving-Up Day—no classes after 10 a.m.
May	1-3	Friday- Sunday	Parents' Weekend
	23	Saturday	Final examinations begin
June	2	Tuesday	Final examinations and second semester end
	7	Sunday	Commencement

SUMMER SESSIONS 1970

See catalog of the Summer School

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