

CORNELL UNIVERSITY OFFICIAL PUBLICATION

Volume XVII

Number 10

Announcement of the College of Arts and Sciences

1926-27

Ithaca, New York
Published by the University
April 15, 1926

THE UNIVERSITY CALENDAR FOR 1926-27

Observed by all the departments of the University at Ithaca.

1926	FIRST TERM	
Sept. 13, <i>Monday,</i>	}	Entrance examinations begin.
Sept. 22, <i>Wednesday,</i>		Registration and assignment of new students.
Sept. 23, <i>Thursday,</i>		
Sept. 24, <i>Friday,</i>		Registration and assignment of old students.
Sept. 25, <i>Saturday,</i>		Assignments concluded.
Sept. 27, <i>Monday,</i>		Instruction begins at 8 A. M.
Oct. 15, <i>Friday,</i>		Last day for payment of tuition for the first term.
Nov. 25, <i>Thursday,</i>		Thanksgiving Day; a holiday.
Dec. 22, <i>Wednesday,</i>		Instruction ends at 1 P. M.
1927		} Christmas Recess
Jan. 5, <i>Wednesday,</i>		
Jan. 11, <i>Tuesday,</i>		Instruction resumed, 1 P. M.
Jan. 22, <i>Saturday,</i>		Founder's Day.
Jan. 24, <i>Monday,</i>		Instruction ends.
Feb. 2, <i>Wednesday,</i>		Term examinations begin.
Feb. 3, <i>Thursday,</i>		Term ends.
		A holiday.
	SECOND TERM	
Feb. 4, <i>Friday,</i>	}	Registration of all students.
Feb. 5, <i>Saturday,</i>		
Feb. 7, <i>Monday,</i>		Instruction begins at 8 A. M.
Feb. 28, <i>Monday,</i>		Last day for payment of tuition for the second term.
April 2, <i>Saturday,</i>		Instruction ends at 1 P. M.
April 11, <i>Monday,</i>		Instruction resumed, 8 A. M.
May 21, <i>Saturday,</i>		Spring Day: a holiday.
May 30, <i>Monday,</i>		Term examinations begin.
June 7, <i>Tuesday,</i>		End of term examinations.
June 13, <i>Monday,</i>		COMMENCEMENT.

COLLEGE OF ARTS AND SCIENCES

FACULTY

LIVINGSTON FARRAND, A.B., M.D., L.H.D., LL.D., President of the University.
ROBERT MORRIS OGDEN, Ph. D., Dean of the College of Arts and Sciences and Professor of Education.

C. WILSON SMITH, A.B., LL.B., Ed.M., Secretary of the College of Arts and Sciences and Assistant Professor of Education.

SIMON HENRY GAGE, B.S., Professor of Histology and Embryology, Emeritus.
THOMAS FREDERICK CRANE, Ph.D., Litt.D., Professor of the Romance Languages and Literatures, Emeritus.

JOHN HENRY COMSTOCK, B.S., Professor of Entomology and General Invertebrate Zoology, Emeritus.

CHARLES DEGARMO, Ph.D., Professor of the Science and Art of Education, Emeritus.

GEORGE SYLVANUS MOLER, A.B., B.M.E., Professor of Physics, Emeritus.
EDWARD LEAMINGTON NICHOLS, Ph.D., LL.D., Professor of Physics, Emeritus.

GEORGE PRENTICE BRISTOL, A.M., Professor of Greek, Emeritus.

GEORGE LINCOLN BURR, A.B., LL.D., Litt.D., Professor of Medieval History, Emeritus.

JOHN HENRY TANNER, Ph.D., Professor of Mathematics, Emeritus.

EDWARD BRADFORD TITCHENER, Ph.D., LL.D., D.Sc., Litt.D., Lecturer in Psychology.

NATHANIEL SCHMIDT, A.M., Professor of Semitic Languages and Literatures and of Oriental History.

WALTER FRANCIS WILLCOX, Ph.D., LL.D., Professor of Economics and Statistics.

LOUIS MUNROE DENNIS, Ph.B., B.S., D.Sc., Professor of Inorganic Chemistry.
JOSEPH ELLIS TREVOR, Ph.D., Professor of Thermodynamics.

CHARLES HENRY HULL, Ph.D., Goldwin Smith Professor of American History.

WILLIAM RIDGELY ORNDORFF, Ph.D., Professor of Organic Chemistry.

WILDER DWIGHT BANCROFT, Ph.D., World War Memorial Professor of Physical Chemistry.

ERNEST GEORGE MERRITT, M.E., World War Memorial Professor of Physics.

CHARLES VAN PATTEN YOUNG, A.B., Professor of Physical Education.

ABRAM TUCKER KERR, B.S., M.D., Professor of Anatomy.

FREDERICK BEDELL, Ph.D., Professor of Applied Electricity.

FRANK THILLY, Ph.D., LL.D., Professor of Philosophy.

HEINRICH RIES, Ph.D., Professor of Geology.

WILLIAM ALEXANDER HAMMOND, Ph.D., Sage Professor of Ancient Philosophy and of Aesthetics.

ERNEST ALBEE, Ph.D., Professor of Philosophy.

BENJAMIN FREEMAN KINGSBURY, Ph.D., M.D., Professor of Histology and Embryology.

MARTIN WRIGHT SAMPSON, M.A., Goldwin Smith Professor of English Literature.

WILLIAM STRUNK, JR., Ph.D., Professor of English.

HERBERT CHARLES ELMER, Ph.D., Professor of Latin.

- CHARLES LOVE DURHAM, Ph.D., Litt.D., Professor of Latin.
 GILBERT DENNISON HARRIS, Ph.B., Professor of Paleontology and Stratigraphic Geology.
 GEORGE WALTER CAVANAUGH, B.S., Professor of Agricultural Chemistry.
 JOHN IRWIN HUTCHINSON, Ph.D., Professor of Mathematics.
 VIRGIL SNYDER, Ph.D., Professor of Mathematics.
 ALBERT BERNHARDT FAUST, Ph.D., Professor of German.
 EMILE MONNIN CHAMOT, Ph.D., Professor of Chemical Microscopy and Sanitary Chemistry.
 ARTHUR WESLEY BROWNE, Ph.D., Professor of Inorganic Chemistry.
 ADAM CAPEN GILL, Ph.D., Professor of Mineralogy and Petrography.
 JULIAN PLEASANT BRETZ, Ph.D., Professor of American History.
 JAMES GEORGE NEEDHAM, Ph.D., Professor of Entomology and Limnology.
 GLENN WASHINGTON HERRICK, B.S.A., Professor of Economic Entomology.
 GEORGE NIEMAN LAUMAN, B.S.A., Professor of Rural Economy.
 OSKAR AUGUSTUS JOHANNSEN, Ph.D., Professor of Entomology.
 JAMES FREDERICK MASON, Ph.D., Professor of the Romance Languages and Literatures.
 LANE COOPER, Ph.D., Professor of the English Language and Literature.
 ALBERT WILHELM BOESCHE, Ph.D., Professor of German.
 PAUL RUSSEL POPE, Ph.D., Professor of German.
 GEORGE LIVINGSTON HAMILTON, Ph.D., Professor of the Romance Languages and Literatures.
 HERBERT JOSEPH DAVENPORT, Ph.D., Professor of Economics.
 CARL BECKER, Ph.D., John Stambaugh Professor of History.
 FLOYD KARKER RICHTMYER, Ph.D., Professor of Physics.
 ROSWELL CLIFTON GIBBS, Ph.D., Professor of Physics.
 DONALD ENGLISH, B.S., M.B.A., Professor of Economics and Accounting.
 FREDERICK CLARKE PRESCOTT, A.B., Professor of English.
 CLARK SUTHERLAND NORTHUP, Ph.D., Professor of English.
 OTHON GOEPP GUERLAC, Licencié ès lettres, Licencié en droit, World War Memorial Professor of the Romance Languages and Literatures.
 HUGH DANIEL REED, Ph.D., Professor of Zoology.
 JOSEPH QUINCY ADAMS, Ph.D., Litt.D., Professor of English.
 FRANCIS ROBERT SHARPE, Ph.D., Professor of Mathematics.
 EUGENE PLUMB ANDREWS, A.B., Professor of Archaeology.
 HARRY PORTER WELD, Ph.D., Professor of Psychology.
 WALLACE NOTESTEIN, Ph.D., Litt.D., Goldwin Smith Professor of English History.
 HORACE LEONARD JONES, Ph.D., LL.D., Professor of Greek.
 JAMES CHESTER BRADLEY, Ph.D., Professor of Entomology and Curator of Invertebrate Zoology.
 ALEXANDER M. DRUMMOND, A.M., Professor of Public Speaking.
 FRED HOFFMAN RHODES, Ph.D., Professor of Chemistry.
 RIVERDA HARDING JORDAN, Ph.D., Professor of Education.
 SAMUEL LATIMER BOOTHROYD, M.S., Professor of Astronomy.
 PRESERVED SMITH, Ph.D., Litt.D., Professor of Medieval History.
 OSCAR DIETRICH VON ENGELN, Ph.D., Professor of Physical Geography.

- ARTHUR RANUM, Ph.D., Professor of Mathematics.
LAURENCE PUMPELLY, Ph.D., Professor of the Romance Languages and Literatures.
HAROLD LYLE REED, Ph.D., Professor of Economics and Finance.
ROBERT E. CUSHMAN, Ph.D., Professor of Political Science.
KARL MCKAY WIEGAND, Ph.D., Professor of Botany.
LEWIS KNUDSON, Ph.D., Professor of Botany.
ARTHUR JOHNSON EAMES, Ph.D., Professor of Botany.
LESTER WAYLAND SHARP, Ph.D., Professor of Botany.
OTIS FREEMAN CURTIS, Ph.D., Professor of Botany.
OTTO KINKELDEY, Ph.D., Professor of Music.
HALLDOR HERMANNSSON, Professor of the Scandinavian Languages and Literatures.
JAMES FREDERICK MOUNTFORD, Litt.D., Professor of the Classics.
WALLIE ABRAHAM HURWITZ, Ph.D., Professor of Mathematics.
WALTER BUCKINGHAM CARVER, Ph.D., Professor of Mathematics.
DAVID CLINTON GILLESPIE, Ph.D., Professor of Mathematics.
THOMAS ROLAND BRIGGS, Ph.D., Professor of Chemistry.
ALBERT HAZEN WRIGHT, Ph.D., Professor of Zoology.
ARTHUR AUGUSTUS ALLEN, Ph.D., Professor of Ornithology.
CHARLES CLARENCE BIDWELL, Ph.D., Professor of Physics.
SUMNER HUBER SLICHTER, Ph.D., Professor of Economics.
GEORGE IRVING DALE, Ph.D., Professor of the Romance Languages and Literatures.
MAX LUDWIG WOLFRAM LAISTNER, M.A., Professor of Ancient History.
LOREN CLIFFORD PETRY, Ph.D., Professor of Botany.
BENTON SULLIVAN MONROE, Ph.D., Assistant Professor of English.
GUY BROOKS MUCHMORE, A.B., Assistant Professor of Public Speaking.
JAMES BATCHELLER SUMNER, Ph.D., Assistant Professor of Biochemistry in the Department of Physiology.
LESLIE NATHAN BROUGHTON, Ph.D., Assistant Professor of English.
CLYDE FIRMAN CRAIG, Ph.D., Assistant Professor of Mathematics.
FREDERICK WILLIAM OWENS, Ph.D., Assistant Professor of Mathematics.
EARLE HESSE KENNARD, Ph.D., Assistant Professor of Physics.
ALBERT LEROY ANDREWS, Ph.D., Assistant Professor of German.
FREDERICK MILLER SMITH, A.B., Assistant Professor of English.
HARLEY EARL HOWE, Ph.D., Assistant Professor of Physics.
EVERETT LEE HUNT, M.A., Assistant Professor of Public Speaking.
CARLETON CHASE MURDOCK, Ph.D., Assistant Professor of Physics.
BENJAMIN PERCY YOUNG, Ph.D., Assistant Professor of Zoology.
JAMES WENCESLAS PAPEZ, B.A., M.D., Assistant Professor of Anatomy and Neurology.
KARL M. DALLENBACH, Ph.D., Assistant Professor of Psychology.
LOUIS BENJAMIN HOISINGTON, Ph.D., Assistant Professor of Psychology.
JOHN WILLIAM HEBEL, Ph.D., Assistant Professor of English.
FREDERIC EBELL FISKE, Ph.D., Assistant Professor of English.
JACOB ROLAND COLLINS, Ph.D., Assistant Professor of Physics.
MELVIN L. NICHOLS, Ph.D., Assistant Professor of Analytical Chemistry.

PETER WALTER CLAASSEN, Ph.D., Assistant Professor of Biology.
 FORREST GLENN TUCKER, Ph.D., Assistant Professor of Physics.
 GEORGE E. G. CATLIN, Ph.D., Assistant Professor of Political Science.
 HAROLD D. SMITH, A.B., Mus.B., Assistant Professor of Music.
 MORRIS ALBERT COPELAND, Ph.D., Assistant Professor of Economics.
 HERBERT AUGUST WICHELNS, Ph.D., Assistant Professor of Public Speaking.
 HAROLD ROBERT SMART, Ph.D., Assistant Professor of Philosophy.
 LOUIS AGASSIZ FUERTES, Lecturer in Ornithology.
 HARRY CAPLAN, Ph.D., Assistant Professor of the Classics.
 JACOB PAPISH, Ph.D., Assistant Professor of Chemistry.
 HOWARD BERNHARDT ADELMANN, Assistant Professor of Histology and Embryology.
 CHARLES MERRICK NEVIN, A.B., B.S., M.S., Assistant Professor of Geology.
 ROBERT ALEXANDER MACKEY, Ph.D., Assistant Professor of Political Science.
 STACY MAY, Ph.D., Assistant Professor of Economics.
 ERNEST WILLIAM NELSON, Ph.D., Acting Assistant Professor of Medieval History.
 HORACE B. DAVIS, Acting Assistant Professor of Economics.
 ASA EMANUEL MCKINNEY, Ph.D., Assistant Professor of Inorganic Chemistry.

INSTRUCTORS

DANE LEWIS BALDWIN, M.A., Instructor in English.
 FREDERICK RAYMOND GEORGIA, Ph.D., Instructor in Chemistry.
 ERNEST TROWBRIDGE PAINE, Ph.D., Instructor in Philosophy.
 AARON BODANSKY, Ph.D., Instructor in Biochemistry.
 MIGUEL ZAPATA Y TORRES, A.B., Instructor in the Romance Languages and Literatures.
 MARY JONES FISHER, Ph.D., Instructor in Zoology.
 AMY GRACE MEKEEL, A.M., Instructor in Zoology.
 PERCY AUSTIN FRALEIGH, A.M., Instructor in Mathematics.
 DAVID TRUXTON WILBER, A.B., Instructor in Physics.
 PIERRE MERTZ, A.B., Instructor in Physics.
 MILTON DAVID MARX, A.M., Instructor in English.
 GEORGE L. COLEMAN, A.B., Instructor in Music.
 WALTER HOYT FRENCH, A.B., Instructor in English.
 HILLEL PORITSKY, A.B., Instructor in Mathematics.
 GEORGE RAYMOND VAN ALLEN, A.B., Instructor in English.
 ROY MARSHALL FISHER, A.B., Instructor in Physics.
 ELEANOR CLARA McMULLEN, A.M., Instructor in Zoology.
 FREDERICK ARTHUR MAY, A.B., Instructor in Physics.
 MERIT SCOTT, A.B., Instructor in Physics.
 GEORGE HENRY BRANDES, B. Chem., Instructor in Chemistry.
 RALPH THOMAS KLINE CORNWELL, B. Chem., Instructor in Chemistry.
 WALTER PAUL JONES, A.B., Instructor in English.
 MARCEL KESSEL, A.B., Instructor in English.
 ROBERT HANNAH, A.M., Instructor in Public Speaking.
 DONALD EVERETT RICHMOND, A.B., M.S., Instructor in Mathematics.

MORRIS GILBERT BISHOP, A.M., Instructor in the Romance Languages and Literatures.

WESLEY BARNETT CARROLL, A.B., Instructor in English.

VI ARVIN GRAHAM, Ph.D., Instructor in Biochemistry.

ELMER MARKER JOHNSON, A.B., Instructor in English.

DALE RAYMOND MITCHELL, A.B., Instructor in English.

GUY SHEPARD GREENE, A.B., Instructor in English.

ARTHUR RAYMOND RIDDLE, A.B., Instructor in Physics.

LEO BEHR, M.E., Instructor in Physics.

HARWOOD BURROWS DOLBEARE, A.B., Instructor in Economics.

WALTER HUTCHINSON STANTON, A.B., Instructor in Physics.

DELBERT ERNEST KEENAN, A.M., Instructor in the Romance Languages and Literatures.

WILLARD CHRISLER BEATTY, A.B., Instructor in Economics and Accounting.

KENNETH COLE, M.E., Instructor in Physics.

CHARLES KENNETH THOMAS, A.B., Instructor in Public Speaking.

ARTHUR WARD GILBERT, B.S., Instructor in Education.

ROBERT BRAINARD COREY, Ph.D., Instructor in Analytical Chemistry.

CLYDE WALTER MASON, Ph.D., Instructor in Chemistry.

CHARLES WALTER MORSE, B.Chem., Instructor in Chemistry.

FRED WILLIAM WARBURTON, Instructor in Physics.

EDGAR BLAUVELT JOHNSON, Ph.D., Instructor in Chemistry.

HOWARD WILLIS RUSSELL, A.B., Instructor in Physics.

ROBERT LEWIS HANSON, A. B., Instructor in Physics.

HOULDER HUDGINS, A.B., Instructor in Economics and Accounting.

BEN RAYMOND BEISEL, B.S., Instructor in Mathematics.

WILLIAM BUCKE CAMPBELL, B.S. in M.E., Instructor in Mathematics.

HERBERT ROLLIN CHILDS, A.B., Instructor in Physics.

JOSEPH ALMA DYE, A.B., Instructor in Physiology.

ALBERT SIDNEY HAZZARD, A.B., Instructor in Zoology.

BRADFORD FISHER KIMBALL, A.M., Instructor in Mathematics.

JOHN RANDOLPH LINDSAY, A.B., Instructor in English.

JAMES D. MCGILL, A.M., Instructor in Political Science.

WALTER BERTRAM MOREHOUSE, M.S., Instructor in Physics.

LAWRENCE ONIS MORGAN, M.A., Instructor in Anatomy.

RUTH NIMMO St. JOHN, A.M., Instructor in Geology.

HERMAN EASTMAN SEEMAN, A.B., Instructor in Physics.

WILLIAM CHARLES SENNING, A.B., Instructor in Zoology.

MALCOLM LOWNSBURY WILDER, Ph.D., Instructor in English.

JOSEPH WEINSTEIN HATHCOCK, A.M., Instructor in Economics.

HAROLD CONWAY SHAUB, M.A., Instructor in Mathematics.

PERCIVAL LEMON CLARK, A.B., Instructor in Mathematics.

FREDERICK LOVELL BIXBY, A.B., Instructor in Psychology.

PUTNAM FENNEL JONES, A.M., Instructor in English.

CORWIN D. EDWARDS, A.B., B.J., B.Litt., Instructor in Economics.

PAUL MARTIN O'LEARY, A.B., Instructor in Economics.

JACK MISCALL, M.S., Instructor in Chemistry.

WILLIAM THOMAS MCCREADIE, A.M., Instructor in Mathematics.

- JAMES HART CURRY MARTENS, C.E., M.Sc., Instructor in Geology.
 JOHN JAMES ELSON, A.B., Instructor in English.
 FRANK SAMUEL FREEMAN, B.S., Ed.M., Instructor in Education.
 LEWIE W. ADAMS, B.S., Instructor in Economics.
 ROBERT A. BRADY, A.B., Instructor in Economics.
 LEO JOSEPH LARKIN, A.B., Instructor in Economics.
 EMMETT B. McNATT, A.B., Instructor in Economics.
 JEAN WOLFENDER, A.M., Agrégé de Mathématiques, Instructor in Mathematics.
 RALPH PALMER AGNEW, A.M., Instructor in Mathematics.
 HARRY IVES LANE, A.M., Instructor in Mathematics.
 FAY FARNUM, A.M., Instructor in Mathematics.
 SAMUEL FELDMAN, Ph.D., Instructor in Psychology.
 HARRY MARION FRIDLEY, M.S., Instructor in Geology.
 DAVID WOOLSEY TRAINER, M.S., Instructor in Geology.
 CHARLES SUMNER GWYNNE, M.S., Instructor in Geology.
 GEORGE BURWAST LANGFORD, B.A., Instructor in Geology.
 ARTHUR LENSON WOEHL, M.A., Instructor in Public Speaking.
 WILBUR ELWYN GILMAN, A.B., Instructor in Public Speaking.
 JOSEPH PATRICK KELLY, A.B., Instructor in Public Speaking.
 OTTO SIEGFRIED FLEISSNER, Ph.D., Instructor in German.
 WILLIAM RAY KINGERY, A.B., Instructor in the Romance Languages and Literatures.
 WALTER KINKAID, B.S., Instructor in Physics.
 NORMAN LAURENCE LARSEN, A.B., Instructor in Physics.
 JOSÉ B. ALEMANY, Instructor in the Romance Languages and Literatures.
 MILES DAVID PIRNIE, Instructor in Zoology.
 DONALD SIMS RICKARD, A.M., Instructor in the Romance Languages and Literatures.
 PAUL ROGERS, A.M., Instructor in the Romance Languages and Literatures.
 THOMAS JENNISON PARMLEY, B.S., Instructor in Physics.
 EVERETT EDWARD ZIMMERMAN, A.M., Instructor in Physics.
 CLARENCE LEE SHILLIDAY, Ph.B., M.S., Instructor in Zoology.
 MICHEL DARD, Licencié ès lettres, Licencié en droit, Instructor in the Romance Languages and Literatures.
 GEORGE HARRISON MAUGHAN, M.A., Instructor in Physiology.

ASSISTANTS

- FRANK OSCAR AGEL, Assistant in Chemistry.
 NICHOLAS BACON, B.Chem., Assistant in Chemistry.
 LAVERNE BALDWIN, A.B., Assistant in Romance Languages.
 SIDNEY WILSON BARNES, A.B., Assistant in Physics.
 GEORGE MONROE BATEMAN, B.S., Assistant in Chemistry.
 IRVING TRACY BEACH, B.Chem., Assistant in Chemistry.
 GILBERT RICHARD BEEBE, B.Chem., Assistant in Chemistry.
 ARTHUR EDSON BIRCH, B.S., Assistant in Chemistry.
 LEON EVANS BOWE, A.B., Assistant in Chemistry.
 SEYMOUR WILSON BRAINARD, B.S., Assistant in Chemistry.
 JAMES DABNEY BURFOOT, M.S., Assistant in Geology.

FACULTY

9

MILTON LESTER BYRON, B.Chem., Assistant in Chemistry.
DUDLEY HAROLD CARDWELL, M.S., Assistant in Geology.
PETER PANAGIOTES CARODEMOS, B.S., Assistant in Chemistry.
EDWIN SMITH DAY, A.B., Assistant in Chemistry.
RICHARD ROY DUNHAM, A.B., Assistant in Public Speaking.
RICHARD WALTER EDWARDS, Assistant in Geology.
DONALD WELLS EXNER, Assistant in Physics.
WALLACE KNIPPERT FERGUSON, A.M., Assistant in History.
MAX HAROLD FISCH, A.B., Assistant in Philosophy.
RAYMOND HERBERT FLECKENSTEIN, B.Chem., Assistant in Chemistry.
CHARLES REDMAN FORDYCE, M.A., Assistant in Chemistry.
JAMES WILLIAM FRAZE, M.A., Assistant in Chemistry.
CARL WITZ GARTLEIN, B.A., Assistant in Physics.
HAROLD ELLSWORTH GOLDSMITH, B.Chem., Assistant in Chemistry.
JOY PLEASANT GUILFORD, M.A., Assistant in Psychology.
DANFORTH RAWSON HALE, A.B., Assistant in Chemistry.
SCHULER P. HALL, B.A., M.S., Assistant in Physics.
HUGH BAYARD HODGE, JR., B.Chem., Assistant in Chemistry.
DONALD AUBREY HOLT, B.Chem., Assistant in Chemistry.
HARRY JAMES HOSKING, B.S., Assistant in Chemistry.
ROBERT CHARLES HOUCK, B.Chem., Assistant in Chemistry.
HENRY PIERCE HOUSE, M.A., Assistant in Chemistry.
EDWARD WESLEY HUGHES, B.Chem., Assistant in Chemistry.
HOWARD LOUIS HUNTER, B.Chem., Assistant in Chemistry.
ERNEST JACOB JOSS, M.A., Assistant in Chemistry.
JOHN CALVIN KELLER, B.S., Assistant in Chemistry.
THEODORE GLADDEN KENNARD, B.A., Assistant in Chemistry.
LAWRENCE GANE KNOWLTON, A.B., Assistant in Chemistry.
GEORGE KREEZER, A.B., Assistant in Psychology.
GERALD KRUGER, Assistant in Physics.
WAYNE EDWARD KUHN, B.A., Assistant in Chemistry.
WALTER BRAMBLE KUNZ, M.A., Assistant in Chemistry.
HAROLD WILLIAM LANDIN, A.M., Assistant in History.
LOUIS LEONARD LARSON, B.S., Assistant in Chemistry.
ALBERT WASHINGTON LAUBENGAYER, B.Chem., Assistant in Chemistry.
HAROLD ADLARD LOVENBERG, B.Chem., Assistant in Chemistry.
MAURICE JACKSON MURRAY, A.B., Assistant in Chemistry.
THEODORE NIXON, A.B., Assistant in History.
WINTON IRVING PATNODE, Assistant in Chemistry.
GEORGE PROUT, A.B., Assistant in History.
WALTER GUSTAV C. RAMBERG, Assistant in Physics.
HERBERT JOSEPH REICH, M.E., Assistant in Physics.
FELIX EDWARD REIFSCHNEIDER, B.Chem., Assistant in Chemistry.
HARRIS WHITE ROGERS, M.S., Assistant in Chemistry.
HOWARD WILLIS RUSSELL, A.B., Assistant in Physics.
CHARLES BLACKMER RUTENBER, B.Chem., Assistant in Chemistry.
CHARLES HAMILTON SAYLOR, B.Chem., Assistant in Chemistry.
CARLISLE SCHADE, B.Chem., Assistant in Chemistry.

- PEARL GERTRUDE SHELDON, Ph.D., Curator in Geology.
ALVIN FROST SHEPARD, B.Chem., Assistant in Chemistry.
RICHARD WELLINGTON SMITH, B.S., Assistant in Geology.
CHARLES WILLIAM STILLWELL, B.Chem., Assistant in Chemistry.
JOHN VERTREES STARR, A.B., Assistant in Chemistry.
MARCELLUS HENRY STOW, Assistant in Geology.
ALEXANDER THOMSON, B.A., Assistant in History.
CARL WILLIAM TUCKER, M.S., Assistant in Chemistry.
WESLEY GABRIEL VANNOY, M.S., Assistant in Chemistry.
ROMULUS SEITZ VON HAZMBURG, B.Chem., Assistant in Chemistry.
GEORGE BAKER WELCH, B.S., Assistant in Physics.
HARLEY ELLIOTT WHITE, A.B., Assistant in Physics.
HERBERT HOWARD WILLIAMS, Assistant in Geology.
CHARLES OLIVER WILLITS, B.S., Assistant in Chemistry.

COURSES AND REQUIREMENTS

Regarding admission to the College of Arts and Sciences, the General Circular of Information should be consulted.

Two courses are offered in the College of Arts and Sciences, one leading to the degree of Bachelor of Arts, the other leading to the degree of Bachelor of Chemistry.

Neither degree will be conferred upon any student who has not been in residence at Cornell University during the last two terms preceding graduation.

A student who does not pass twelve hours in any term, with a grade of C or better in at least six of the twelve hours, will be either dropped or placed upon probation.

A student's general record may be so unsatisfactory that the Faculty will refuse him permission to continue in the College even though he has passed twelve hours in the preceding term.

A student failing in the last term of his senior year to pass twelve hours—or, if in a summer session, four hours—may not be recommended for his degree except under such conditions and at such time as the Faculty may designate.

REGISTRATION

Students will file their study cards at the office of the Dean in accordance with instructions issued at the time of registration.

With the consent of the Dean and the approval of his adviser, a student may alter his list of courses during the first six days of instruction. Thereafter, no student will be permitted to cancel his registration for any course in which he is registered, unless he shall previously have obtained from the Dean authorization to do so on the ground of ill health, or for other reasons beyond the student's control.

THE GEORGE C. BOLDT MEMORIAL SCHOLARSHIPS

Mr. George C. Boldt, jr., has created three scholarships of the annual value of five hundred dollars each as a memorial to his father. These scholarships will be awarded at the close of the junior year to the three male students of the College who shall be considered most deserving of this aid. Applications for these scholarships must be filed in the Office of the Dean before March 15 of the academic year preceding the year for which they are awarded.

THE DEGREE OF BACHELOR OF ARTS

I. REQUIREMENTS FOR GRADUATION

1. Credit for one hundred and twenty hours, of which at least ninety hours must be for courses given in the College of Arts and Sciences.

2. A grade of C or better in at least sixty of the required one hundred and twenty hours. (See Section IV: Marks.)
3. Election of courses in accordance with Section III, Course of Study.
4. Completion of the work in Hygiene and Preventive Medicine, and in Military Drill or in Physical Training prescribed by the University Faculty. (See pages 75, 76).

II. SPECIAL PROVISIONS REGARDING CREDITS TOWARD GRADUATION

5. **In Summer Sessions.** To obtain credit by means of work done in summer sessions, a student must previously have satisfied the entrance requirements of the College, and must obtain in advance the Dean's approval of his selection of courses. Credit for a maximum of thirty hours, but no more, may be secured in this way.

Credit will be allowed under the same restrictions for work done in summer sessions of other universities belonging to the Association of American Universities by a student regularly registered in this College, but permission to offer such credit must be obtained in advance from the Dean of this College.

6. **Admission to Advanced Standing.** A student admitted to the College of Arts and Sciences from another college of Cornell University, or from any other institution of collegiate rank, will receive credit toward the degree of Bachelor of Arts for the number of hours to which his records may, in the judgment of the Faculty, entitle him. In order, however, to obtain the degree of Bachelor of Arts, he must, as a candidate for that degree, have been in residence at least two terms in the College of Arts and Sciences, and in that college only.

7. **Registration in Two Colleges of the University.** A student who has completed at least ninety hours in courses given in the College of Arts and Sciences may, with the permission of the Faculties concerned, be registered both in the College of Arts and Sciences and also in the Medical College or the Law School. (See paragraph 12, division a.)

8. **Registration in the College and in the Graduate School.** A student who has satisfied all the academic requirements for graduation may, with the permission of the Graduate School, register both in the College of Arts and Sciences and in the Graduate School.

III. COURSE OF STUDY

9. **Number of Hours.** A student must register in each term for at least twelve hours of work. No student may register for more than eighteen hours in any term except by permission of the Dean. A student who has not attained in any academic year a grade of C or better in a total of fifteen hours of work will not be permitted to elect more than fifteen hours of work in either term of the subsequent academic year. For registration in a course not in the College of Arts and

Sciences, the permission of the Dean of this College and of the Professor in charge of the course must be obtained. (See also paragraph ii under 12c below.)

10. **Prescribed Studies.** Prior to graduation, a student must complete six hours in each of the first two groups listed below and six hours in each of five of the remaining six groups:

1. English and Public Speaking.
2. Foreign Languages.
3. History.
4. Astronomy, Chemistry, and Physics.
5. Biology (including Botany and Animal Biology), and Geology.
6. Philosophy and Psychology, including Educational Psychology.
7. Economics and Government. (For the present Economics I, five hours, will be accepted in satisfaction of this requirement.)
8. Mathematics.

11. **Underclassmen.**

a. *Underclass Requirements.* Before the end of the sophomore year, each student is required to complete, in addition to the first two groups mentioned in paragraph 10 above, at least eighteen of the required number of hours in five of the remaining six groups. Of these hours, the student is required to take at least twelve, and advised to take more, in his freshman year. Each six hours may be entirely in one division (for example, English six hours), or partly in one and partly in another (for example, English three hours and Public Speaking three hours). The following courses in foreign languages may not be applied in satisfaction of the foreign language requirement: Greek 1a, 1b; German 1, 1a, 3, 3a; French 1, 3, 3a; Spanish 1, 3; Italian 1. College credit gained by examination at entrance may not be applied in satisfaction of any of these underclass requirements.

These requirements must be completed before a student may begin counting hours in an upperclass group. (See paragraph 12 below.)

b. *Underclass Advisers.* Freshmen and sophomores are under the jurisdiction of the Advisory Board for Underclassmen. Each freshman will be assigned to a member of the Faculty who will act as his adviser during his freshman and sophomore years. The function of the adviser is to assist the student in his choice of studies, to advise him during the term regarding his work, and generally to give him friendly counsel. The approval of the study card and the signature of the adviser must be obtained before the study card is filed at the office of the Dean.

c. *Courses Open to Freshmen.*

i. The following are the courses in the College of Arts and Sciences open to freshmen, except that (1) a student may not register for any of these courses for which he has not satisfied the prerequisites, if any are specified (see announcement under each course); (2) a student may not register for any of these courses for which he has presented an acceptable equivalent at entrance:

Animal Biology 1, 303, 306
 Bibliography 1
 Biology 1
 Botany 1
 Chemistry 101, 105, 205, 210, 225, 875
 English 3, 3a
 French 1, 3, 4a, 4b, 5a, 5b, 6
 Geology 100, 101, 200, 201, 311, 400
 German 1, 1a, 3, 3a, 4, 5, 8
 Greek 1a, 1b, 2a, 2b
 History 1, 61
 Italian 1, 4
 Latin 1a, 1, 2
 Mathematics 1, 2, 3, 4, 5, 7, 15
 Music 1, 6, 7, by examination (see page 59).
 Physics, 3, 4, 6
 Spanish 1, 3, 4a, 4b, 5a, 5b, 6

ii. Subject to the permission mentioned in paragraph 9, required courses in other colleges in the regular freshman schedule of those colleges may be elected by a freshman in the College of Arts and Sciences, but only after first obtaining the approval of the Dean of the College and of his adviser.

iii. Under exceptional circumstances, a freshman may by petition secure permission from the Advisory Board for Underclassmen to take courses (including freshman electives in other colleges) in addition to those allowed under i and ii.

12. Upperclassmen.

a. *Upperclass Requirements.* When a student has completed sixty hours including the underclass requirements (see paragraph 11a above) he may select an upperclass group. Prior to graduation, he must complete at least twenty hours of work in the group selected, but courses marked with an asterisk (*) may not be counted toward this requirement. With the sanction of his adviser and of the Dean, a student may choose, instead of one of the upperclass groups listed below, a combination of two related groups. A student registered in this college and in another college of Cornell University is excused from ten of these twenty hours. (See paragraph 7.)

b. *Upperclass Advisers.* In choosing his course, an upperclass student must obtain the advice and approval of some professor or assistant professor in his major subject whose signature on the study card must be secured before it may be filed.

c. *Upperclass Groups.*

1. The Classics.
2. Botany.
3. Chemistry.
4. Economics.
5. English and Public Speaking.

6. French and Italian.
7. Geology and Physical Geography.
8. German.
9. History and Government.
10. Mathematics.
11. Philosophy and Education.
12. Philosophy and Psychology.
13. Physics.
14. Animal Biology (Physiology and Biochemistry, Anatomy, Histology, Embryology, Zoology, and Entomology).
15. Psychology and Education (including Physical Education).
16. Spanish and Italian.

d. *Informal Study.* Upperclass group requirements may be satisfied in part by informal study in those departments which provide for such study as a part of the programme of the upperclass group. Informal study in such departments may be applied for by any student who has completed the underclass requirements, and who has at least sixty hours of credit with a grade of B or better in one-half of the hours he has passed. Students may pursue informal study in either the junior or the senior year, or in both years, under the following conditions:

i. Informal study during the first, or junior, year will consist of specified readings and reports, or of experimentation and problem work, which are intended to furnish the student with opportunities for the expression of initiative in his major field of study. This informal study will be supervised by the student's upperclass adviser, and will entitle him to such credit as his adviser is willing to grant for the work the student has completed, provided that no credit in excess of three hours a term shall be given for informal study in the junior year.

ii. The same plan may be followed in the senior year, again entitling the student to a variable amount of credit, not in excess of three hours a term, for informal work done under the supervision of his adviser.

iii. In a department, or departments, constituting an upperclass group in which there is a seminary meeting at least once a week for the purpose of giving tutorial assistance to the students accepted for informal study, the amount of credit obtained by such students may be extended to a maximum of six hours a term during the senior year; provided that, at the close of his senior year, and before his adviser reports credit for this informal work, the student shall have passed successfully a comprehensive examination in the field of study of his upperclass group. (For the degree of Bachelor of Arts with Honors, see page 16.)

Theses. During his last two terms of residence any candidate for the degree of Bachelor of Arts may, with the permission of the Dean, arrange with the Department in which he is taking his principal

work to write a thesis which, if accepted, shall entitle him to not more than three hours of credit a term.

IV. MARKS

13. A, B, C, D are passing grades; E represents a condition; F a failure; Z a course dropped without official cancellation.

14. No credit towards graduation will be given for a course in which a mark of E (condition) is recorded, unless the course be repeated and a passing mark received. A student who has received a mark of E (condition) in any course that is a prerequisite to another course may, at the discretion of the department concerned, be regarded as having satisfied the prerequisite; or the department concerned may, before regarding him as having satisfied the prerequisite, require him, by re-examination or otherwise, to remove the condition.

15. A student who, in any course, has received a term mark of "incomplete" or of "absent" may, with the consent of the Dean, and upon payment of the fee required by the University, be permitted to remove the mark, by examination or otherwise, as the department concerned may direct. A mark of incomplete or of absent may not be removed later than registration day of the third term of attendance in the University, dating from the time the course was taken in class, and no more than one attempt at removal will be allowed.

16. A student who has received a mark of E, of F, or of Z in any course must re-register for it if he desires to secure credit for the course. (See paragraph 14 for E.)

BACHELOR OF ARTS WITH HONORS

The degree of Bachelor of Arts with Honors in the field of a student's upperclass group will be conferred upon those students who, in addition to having completed the requirements for the degree of Bachelor of Arts, shall have (1) received a grade of B or better in at least half of the courses for which they have been enrolled; (2) passed with distinction a thorough comprehensive examination in the field of study in which their upperclass group requirement was satisfied; (3) been recommended for the said degree by the department or departments in which their work for the upperclass group was done.

THE DEGREE OF BACHELOR OF CHEMISTRY

The degree of Bachelor of Chemistry will be awarded to those who have satisfactorily completed the following curriculum and the requirements prescribed by the University in Hygiene and Preventive Medicine and in Military Drill or in Physical Training.

Students who do not present, on entrance, at least two units of French and two units of German, will be required to make up the deficiency before the beginning of the junior year. This may not be done, except with special permission of the Department, by taking University courses in French or German during the academic year.

CURRICULUM

FIRST YEAR

	No. of Course	First Term	Second Term
Introductory Inorganic Chemistry	101	6	—
Introductory Inorganic Laboratory	105	—	3
Introductory Qualitative Analysis	205	—	6
Introductory Qualitative Laboratory	206	—	3
Analytic Geometry and Calculus	5a, 7	5	5
Introductory Experimental Physics	5	—	5
Drawing	125	3	—
English	1	3	3

SECOND YEAR

Introductory Organic Chemistry	305	3	3
Organic Chemistry Laboratory	310	3	3
Introductory Quantitative Analysis	220	6	—
Introductory Quantitative Laboratory	221	—	3
Introductory Chemical Spectroscopy	505	—	3
Gas and Fuel Analysis	250	4 or 0	0 or 4
Elementary Mineralogy	311	0 or 3	3 or 0
Heat and Light	31	2	—
Magnetism and Electricity	32	—	2
Physical Experiments	14	—	2

THIRD YEAR

Introductory Physical Chemistry	405	3	3
Physical Chemistry Laboratory	410	3	3
Advanced Inorganic Chemistry	130	3	3
Introductory Chemical Microscopy	530	3	—
Quantitative Analysis, Lectures	235	—	2
Advanced Quantitative Analysis	230	—	4
Physical Experiments	14	2	—
Elective	(at least)	4	4

FOURTH YEAR

Introductory Industrial Chemistry	705	3	3
Seminary	905	—	1
Research for Seniors		4	4
Mechanical Laboratory	367	—	4
Electrical Engineering	417	4	—
Elective	(at least)	6	6

Candidates for the degree of Bachelor of Chemistry are required to take at least eight hours in research during the senior year in a division of the Department to be selected by the student. These divisions are: Inorganic Chemistry (Course 195); Analytical Chemistry (Course 295); Organic Chemistry (Course 395); Physical Chemistry (Course 495); Optical Chemistry (Course 595); Sanitary Chemistry (Course 695); Industrial Chemistry (Course 795); Agricultural Chemistry (Course 895).

The elective courses required in the curriculum may be chosen by the student, in each case with the approval of the Department of Chemistry, from the advanced courses in Chemistry, or from certain courses in other departments of the College of Arts and Sciences, or in other colleges of the University.

Students in the Course in Chemistry may register for 20 hours a term. In order to register for more than 20 hours, the student must first obtain the consent of the Department.

THE HONOR CODE IN EXAMINATIONS

Under a constitution proposed and adopted by the students, and approved by the University Faculty on March 9, 1921, the students of Cornell University have made themselves responsible for their conduct in examinations and in other tests of work by which they are earning academic credit. For the trial of charges of breach of honor they elect committees of their own—a central committee for the University, and a committee in each of the colleges. Every student is expected to do his share in upholding the code, not only by honorable conduct on his own part, but also by refusal to conceal or condone fraud on another's part. A fraud observed in any college should be reported to a member of the student honor committee of that college.

COURSES OF INSTRUCTION

The courses that are marked with the asterisk (*) may not be counted for an upper-class group.

ASTRONOMY

181. General Astronomy. Throughout the year. Credit six hours upon completion of the course. Not open to freshmen. Professor BOOTHROYD. Sec. a, W F at 9; Sec. b, T Th at 9; Sec. c, W F at 10. Laboratory, M T W Th F 2-4. Each student assigned to one laboratory period a week on day of registration. Evening observations one clear evening each week before Thanksgiving and after the spring recess. Recitations and lectures, *Lincoln* 31; laboratory, *Observatory* and *Lincoln* 37; evening observations, *Observatory*.

A study of the facts and principles of the science of Astronomy, together with a review of its history as illustrating the gradual development of the scientific method.

183. Modern Astronomy. First term. Credit three hours. Prerequisites, Astronomy 181, Physics 62, Mathematics 7. Professor BOOTHROYD. Recitation and lecture, T Th 11. *Lincoln* 31. Laboratory to be arranged.

An elementary exposition of Gravitational Astronomy, followed by a consideration of spectroscopic and other methods of astronomical investigation.

For courses in Practical Astronomy, and other advanced courses, see the Announcement of the College of Engineering and the Announcement of the Graduate School.

BIBLIOGRAPHY

1. Bibliography. First term. Credit two hours. Librarian AUSTEN. T Th 12. *Library, Political Science Seminary Room.*

Applied bibliography dealing with books in groups, their classification, cataloguing, indexing, and preparation.

2. Bibliography. Second term. Credit two hours. Prerequisite, for freshmen, Bibliography 1, or senior standing. Librarian AUSTEN. T Th 12. *Library, Political Science Seminary Room.*

Writing and record making from the earliest times. Writing and book making in the Middle Ages. Printing and book making in modern times.

BIOLOGY

***A. General Biology.** Throughout the year. Credit three hours a term. Assistant Professor CLAASSEN, Mr. CUTLER, and assistants. Lectures, M W 9 or 11, *East Roberts* 222. Laboratory, T F 8-10:30; M T W Th F 2-4:30. *Roberts* 302.

Not open to students who have had college courses in zoology and botany. Students must report to the biology office, Roberts Hall 322, for assignment to laboratory sections.

An elementary course designed for those who do not wish to specialize further in the biological sciences. The main ideas of biology shown through selected practical studies of the phenomena on which biological principles are based. Laboratory fee, \$2.50 a term.

ANIMAL BIOLOGY

***1. Introductory Zoology.** Throughout the year. Credit three hours a term. Professor REED, Assistant Professor YOUNG, Miss MEKEEL, Miss McMULLEN, and Miss PHELPS. Lecture: Section I, T Th 9; Section II, T Th 11. Laboratory: M T W F 2-4:30, S 8-10:30. Lectures, *Goldwin Smith* B. Laboratory, *McGraw* 2.

A comprehensive view of the subject including the fundamentals of Animal Biology, the principles of structural and functional organization in the animal body, the origin and perfection of animal life, and a consideration of those generalizations in zoological theory which seem to be best founded.

Students must register with the department before instruction begins.

*1a. **General Zoology.** Second term. Credit three hours. Assistant Professor YOUNG and Miss MEKEEL. Lecture, Th 10. *McGraw* 5. Laboratory, for veterinary students, T Th 2-4:30; for others, W F 2-4:30. *McGraw* 2.

A general survey of the animal phyla with special emphasis upon fundamental biological principles. The classification of the larger and economic groups is included.

Primarily for students in Veterinary Medicine, Physical Education, and those who enter the premedical course at midyear. Students must register before instruction begins.

2. **Invertebrate Zoology.** Throughout the year. Credit three hours a term. Assistant Professor YOUNG. Lecture, T 8, *McGraw* 5; Laboratory W F 2-4:30, *McGraw* 2.

The structure, development, and relationships of, and the application of biological principles to, invertebrate animals. Field studies of the local fauna are undertaken. Registration before instruction begins is necessary.

3. **General Entomology.** First term. Credit three hours. Prerequisite, Biology 1, Animal Biology 1, or Botany 1. Professor HERRICK, Dr. WEHRLE, and Mr. HARWOOD. Lecture, W F 9; Laboratory, T W Th or F 2-4:30 or S 8-10:30. *Roberts* 392.

The characteristics of orders, sub-orders, and the more important families; the habits of representative species; the structure of insects; practice in their classification.

The lectures only (two hours) may be taken by those who have had Animal Biology 4 and 5. Laboratory fee, \$2.50.

3a. **General Economic Entomology.** Second term. Credit three hours. Prerequisite, Animal Biology 3. Professor HERRICK, Dr. WEHRLE, and Mr. HARWOOD. Lectures, W F 9; Laboratory, W Th or F 2-4:30 or S 8-10:30. *Roberts* 392.

The life histories and habits of injurious insects; the most approved methods of preventing their ravages; the more important insecticides, and the commoner pests. Several excursions will be made to observe the insects in the field. Laboratory fee, \$1.50.

4. **Elementary Morphology of Insects.** Either term. Credit three hours. Prerequisite, Animal Biology 3 or the equivalent. Professor JOHANNSEN and Mr. HERVEY. By appointment. *Roberts* 391.

This course deals with the external and internal anatomy of several common species of insects. (See note under Animal Biology 5.) Laboratory fee, \$2.

5. **Wing Venation and Evolution.** Either term. Credit one hour. Open to freshmen. Professor BRADLEY and Mr. FLETCHER. S 11, and two additional hours during T Th or S mornings, by arrangement. *Roberts* 301.

A laboratory study of evolutionary series as illustrated by progressive modification of the wings of insects. Required of all students who plan to take advanced work in entomology. Laboratory fee, \$1.50.

Animal Biology 4 and 5 are introductory laboratory courses in the structure and classification of insects, required of all students who plan to take advanced work in entomology. The work is individual, and both courses may be taken in one term. Laboratory fee, \$2.

6. **Taxonomy of Insects.** Throughout the year. Credit three hours a term. Prerequisite, Biology 5 and Entomology 21. Professor BRADLEY, Dr. Forbes, and Mr. FLETCHER. Lectures, T 11. *Roberts* 392. Laboratory, W F 2-5. *Roberts* 301. Laboratory fee, \$4.50.

A survey of the classification of insects and of the more important and common species, with a study of the characters by which they may be recognized.

6a. **Elementary Taxonomy of Insects.** Either term. Credit one hour. Prerequisites, Biology 5 and Entomology 21. Professor BRADLEY and Mr. FLETCHER. One laboratory period of three hours during T Th or S mornings, by arrangement. *Roberts* 301.

Elementary practice in the determination of the families and orders of insects, designed for students who wish a brief survey of insects, but who are not planning to carry further their entomological work. Laboratory fee, \$1.50.

7. **Biology of the Human Species.** First term. Credit one hour. Prerequisite, Biology I or the equivalent. Professor NEEDHAM. T Th 11. *Goldwin Smith A.*

The origin and development of man; the evolution of responsive life; the main phenomena of human inheritance; the effect upon population of the alteration of environment by the processes of civilization; the evolution of the social organism, and of social control.

8. **Elementary Taxonomy and Natural History of Vertebrates.** Throughout the year. Credit three hours a term. Professor WRIGHT and Mr. GREELEY. Lectures, M W 8; Laboratory, Section 1, M W 2-4:30, Section 2, T Th 2-4:30. *McGraw 7.*

Lectures on fishes, amphibians, reptiles, birds, and mammals, dealing with the principles of classification and nomenclature, characteristics, relationships, and bionomics of these groups. The laboratory gives practice in the identification of North American species. Field studies of the local fauna are undertaken during the fall and spring.

9. **General Ornithology.** Second term. Credit three hours. Professor ALLEN, Mr. FUERTES, and Mr. PIRNIE. Lectures, M W 11, *McGraw 5.* Laboratory M W 2-4:30 or T Th 2-4:30. *McGraw, South Museum.*

Introduction to the study of birds, particularly the local species. Laboratory work with bird skins. Each student should have Chapman's *Handbook of Birds of Eastern North America*, and bird glasses. Laboratory fee, \$2.

9a. **Advanced Ornithology.** Throughout the year. Credit two hours a term. Prerequisite Animal Biology 9. Professor ALLEN. M W 2-4:30 and by appointment. *McGraw, South Museum.*

Lectures, Laboratory and field work.

This course is a continuation of Course 9 especial emphasis being given to the identification of birds in obscure plumage and to the technique of laboratory and field methods in ornithology, observation blinds, photography, taxidermy, etc.

10. **Cytology.** Second term. Credit four hours. Prerequisite, Botany I or Zoology I. Professor SHARP. Conferences, T Th 9, Laboratory, T Th 10-12:30. *Stone 203.*

The subject matter, literature, and problems of cytology. Of value to advanced students in the various branches of biology, and of special significance for the geneticist. The conference hour is devoted to a discussion of topics suggested by laboratory observations, to assigned reading, and, during the latter part of the term, to the review of new literature. Laboratory fee, \$5.

11. **Comparative Anatomy of Vertebrates.** Throughout the year. Credit three hours a term. Prerequisite, Animal Biology I or 1a. Professor REED, Mr. SENNING, Mr. HAZZARD, and Mr. HUNTER. Lecture, Section I M 8, Section II M 10. *McGraw 5.* Laboratory, W 2-4:30, S 8-10:30; W F 8-10:30; T Th 8-10:30; T Th 2-4:30. *McGraw 6.*

A thorough dissection and study of the several systems of organs of vertebrates. The various systems are considered with reference to their significance in progressive modifications and vertebrate phylogeny. The lectures deal with a comparative study of type forms so arranged as to supplement and connect the laboratory studies.

12a. **Comparative Anatomy and Histology of Insects.** First term. Credit two hours. Prerequisite, Animal Biology 4 and 3, or 5. Professor JOHANNSEN. T Th 10. *Roberts 392.*

Lectures, assigned reading, and reports.

12b. **Insect Embryology and Postembryonic Development.** Second term. Credit two hours. Prerequisite, Animal Biology 4 and 3, or 5. Professor JOHANNSEN. T Th 10. Lectures, assigned readings and reports. *Roberts 392.*

13. **Histology of Insects.** Either term. Credit three hours. Prerequisite or parallel course, Animal Biology 12a. Professor JOHANNSEN. Laboratory, three periods a week, by appointment. *Roberts 391.*

Technique in histological methods as applied to insects and a study of prepared slides of insect tissues. Laboratory fee, \$4.50.

14. **Genetics** (the same course as Plant Breeding 101). First term. Credit four hours. Prerequisite, Botany I and Plant Physiology, or Animal Biology I

and either Animal or Human Physiology. Assistant Professor FRASER, Dr. DORSEY. Lectures, M W F 8, *Fernow* 210; Laboratory, M W or F 2-4:30, *Fernow* 212. One conference period to be arranged.

Courses in cytology and in taxonomic botany and zoology will be found helpful in connection with this course. Students must obtain assignment to sections at the time of registration. Laboratory fee, \$3.

15. **Advanced Genetics** (the same course as Plant Breeding 201). Second term. Credit three hours. Prerequisite, Animal Biology 10 and 14, or Botany 124 and Plant Breeding 101 and the permission of the instructor. Assistant Professor FRASER and Dr. LEWIS. Conferences, T F 2-4, and a laboratory problem in genetic Analysis to be solved at the convenience of the student. *Fernow* 212.

Primarily for graduate students. A reading and laboratory course, with two conference periods of two hours each, and special laboratory work to be done at the student's convenience.

The methods of genetical testing and analysis; factor interaction; factor linkage; sex inheritance; mutation; the numerical results of different systems of breeding and selection. Particular attention will be given to the modes of attacking problems in genetics. Laboratory analyses of experimental data, and studies with *Drosophila*. Laboratory fee, \$3.

20. **Animal Ecology**. First term. Credit three hours. Prerequisite, Zoology 1 or Biology 1. Professor NEEDHAM and Mr. PAUL NEEDHAM. Th 9, Th 2-4:30, and one period by appointment. *Roberts* 392.

The lives of animals in relation to their environment; the relation between their structures and instincts and the situations in which they live. Laboratory fee, \$2.50.

21. **General Limnology**. Second term. Credit three hours. Prerequisite or parallel courses, Biology 1, or Animal Biology 1 and 3, or the equivalent. Professor NEEDHAM and Mr. PAUL NEEDHAM. Lecture, Th 9; Laboratory, Th 2-4:30 and one period by appointment. *Roberts* 392.

The life of inland waters; aquatic organisms in their qualitative, quantitative, seasonal, and ecological relations. The course includes one all-day trip, taken on some Saturday in May. Laboratory fee, \$2.50.

30. **Parasites and Parasitism**. First term. Credit two hours. Prerequisite, Biology 1, or Animal Biology 1. Professor MATHESON and Mr. STONE. Lecture, T 9; Laboratory, M or T 2-4:30. *Roberts* 301.

The origin and biological significance of parasitism, and of the structure, life, and economic relations of representative parasites. Laboratory fee, \$2.

31. **Medical Entomology**. Second term. Credit two hours. Prerequisite, Animal Biology 1 or Biology 1. Professor MATHESON and Mr. STONE. Lecture, T 9, *Roberts* 392. Laboratory, M or T 2-4:30, *Roberts* 301.

Insects and other Arthropods which are the causative agents of disease in man and animals, or are the vectors or intermediate hosts of disease-producing organisms. Laboratory fee, \$2.

40. **Bees**. Second term. Credit three hours. Prerequisite, Animal Biology 3 or equivalent. Professor PHILLIPS. Lectures, T Th 9; laboratory, W 10:30-1 or 2-4:30. *East Roberts* 222.

Fundamentals of beekeeping; the life history, instincts, and general behavior of bees; their products; the sources of honey; the role of bees in cross-pollination; the equipment of the apiary; wintering problems; the diseases of bees; and the rearing of queens. Laboratory fee, \$2.50.

60. **Advanced Taxonomy of Animals**. Professors BRADLEY, WRIGHT, and ALLEN, and Dr. FORBES.

Any division of this course may be taken separately.

(a) **Advanced Systematic Entomology**. First term. Credit three or more hours. Prerequisite, Animal Biology 5. Professor BRADLEY. Three laboratory periods of three hours each by appointment. *Roberts* 404.

(d) **Lepidoptera**. First term. Credit three hours. Prerequisite, Animal Biology 3 or the equivalent, and the consent of the instructor. Lecture, M 9; laboratory, M morning and W by appointment. *Roberts* 301.

Students must be familiar with elementary entomology and used to handling insects.

Identification and classification of Lepidoptera, including their caterpillars; with practice in the technique of preparation involved. Mimicry and other biological problems best illustrated by the Lepidoptera.

(f) Ichthyology. Second term. Credit three hours. Professor WRIGHT. Lectures, T Th 8, *McGraw* 7; laboratory, F 2-4:30, or S 8-10:30. Not given in 1926-27.]

(g) Herpetology (Reptilia). First Term. Credit three hours. Professor WRIGHT. Lectures T Th 8, *McGraw* 7; Laboratory, F 2-4:30, or S 8-10:30. Reptiles will be considered in 1926-27.

(h) Ornithology. First term. Credit three hours. Prerequisite, Animal Biology 11, and 8 or 9. Professor ALLEN and Mr. PIRNIE. Lecture, W 11. *McGraw* 5; laboratory and field work, T Th 2-4:30.

The classification of birds; geographical distribution; the literature and institutions of ornithology; identification of both indigenous and exotic representatives of the different families of birds. The first part of the term will be devoted to field work on the fall migration, and the identification of birds in winter plumage.

(i) Mammalogy. Second term. Credit three hours. Professor WRIGHT. Days and hours as in (f).

61. **The Principles of Taxonomy.** First term. Credit one hour. Prerequisite, Animal Biology 1. Professor BRADLEY. M 9. *Roberts* 392.

65. **Entomotaxy.** Second term. Credit two hours. Open to freshmen. Professor BRADLEY. Laboratory and field work, M T 2-5. *Roberts* 301.

Methods of collecting insects and preserving them for study, together with other matters of technique. Rough identification of insects collected during the field work. Three all-day field trips will be required. Laboratory fee, \$4.50.

Lectures and recitations. Practice in the use of generic and specific indices, and of bibliographies; the preparation of bibliographies; methods of preparing.

67. **Seminary in Systematic Vertebrate Zoology.** First and second terms. Credit one hour a term. Distribution and origin of life in North America. Life zone plans of North America, 1817-1920. Zoogeography of the Old World. Animal coloration. Other topics to be announced. Hours to be arranged. Professor A. H. WRIGHT.

70. **Entomological Reading in Foreign Languages.** Throughout the year. No credit. Prerequisite, elementary knowledge of the language. Professor JOHANNSEN. Two hours by appointment. *Roberts* 342.

French, first term; German, second term. Open to advanced students in entomology who have an elementary knowledge of the language.

75. **Laboratory Methods.** Throughout the year. Credit two hours a term. Prerequisite, major work in Biology. Professor CLAASSEN in charge. F 8-10; 2-4:30, and one other period by appointment.

For seniors whose upperclass group is in the field of Biology, and for graduates who expect to teach or to follow some phase of zoology as a profession. This course includes such subjects as laboratory equipment; collecting, preservation, and storage of materials; rearing of cultures; modelling in wax; injection of blood vessels and embalming; chart making, and photography of animals including the preparation of lantern slides.

99. **Zoological Problems and Informal Study.** Throughout the year. Credit hours variable. Admission to the course is by consent of the instructor. Professors NEEDHAM, HERRICK, JOHANNSEN, REED, BRADLEY, CROSBY, PHILLIPS, EMBODY, MATHESON, WRIGHT, and ALLEN, and Assistant Professors CLAASSEN and YOUNG. By appointment.

For qualified seniors and juniors. This course may assume the status of an undergraduate seminar according to the needs and convenience of both teacher and student. Opportunity is afforded for the pursuit of special problems or special phases of zoological study beyond that permitted by the more elementary courses. For research work see the Announcement of the Graduate School.

100. **Conservation of Wild Life.** First term. Credit two hours. Professors NEEDHAM, HOSMER, WIEGAND, HERRICK, ADAMS, EMBODY, PALMER, WRIGHT, ALLEN, Assistant Professors YOUNG and CLAASSEN, Mr. FUERTES and Mr. PIRNIE. T Th 11. *McGraw* 5.

This course, in charge of Professor Allen, is given cooperatively by members of this department and others whose interests lie in the fields of wild life or conservation. It is intended to show the relations of the various conservation interests to one another, to introduce the student to the entire field, and give him the principles and methods of conserving wild life.

101. The Tissues: Histology and Histogenesis. First term. Credit four hours. Prerequisite, Animal Biology I or Biology I. Professor KINGSBURY and assistants. Lectures, T Th 11, *Stimson* 8; Laboratory, Section I, T Th 8-11; Section II, T Th 2-4:30. *Stimson* 39.

For students of biology or those preparing for medicine. The cell and cellular origin of the body, and the structure and development of its component tissues. Each student will prepare or receive a series of typical microscopic preparations.

102. The Organs: Histology and Development. Second term. Credit four hours. Prerequisite, Animal Biology 101 or its equivalent. Professor KINGSBURY and assistants. Lectures, T Th 11, *Stimson* 8; laboratory, T Th 2-4:30, *Stimson* 39.

A continuation of course 101. Courses 101 and 102 together give the fundamental facts of the microscopic structure and development of the body.

104. Vertebrate Embryology. Second term. Credit four hours. Prerequisite, Animal Biology 101 or its equivalent. Assistant Professor ADELMANN and assistants. Lectures, W F 10, *Stimson* 8; laboratory, Section I, T Th 8-11; Section II, W F 2-4:30. *Stimson* 39.

[105. Histology and Histological Methods. First term. Credit three hours. Prerequisite, Animal Biology I or Biology I. Assistant Professor ADELMANN and assistants. Not given in 1926-27.]

For students of biology or those who are preparing for the study of medicine. The course is designed to give the basis for understanding the development of the human body.

107. Advanced Histology and Embryology. Throughout the year. Credit three hours or more a term. Prerequisite, Animal Biology 101, and 102 or 104. Professor KINGSBURY and Assistant Professor ADELMANN. Day and hours to be arranged. *Stimson* 43.

120. The Theory of Development. First term. Credit two hours. Assistant Professor ADELMANN. Hours to be arranged. *Stimson* 8.

Primarily for graduates. One lecture with collateral reading and reports. A series of lectures upon some important phase of Development. The subject for 1926-27 will be "Differentiation." A review of the more important attempts to analyze its nature and cause.

212. Advanced and Research Work in Human Anatomy and Neurology. Throughout the year. Credit two or more hours a term. Professor KERR and Assistant Professor PAPEZ. Hours to be arranged. *Stimson* 52.

The laboratories are open to those who have taken the necessary preliminary courses and are otherwise qualified.

221. Structure of the Human Body. First term. Credit three hours. Prerequisite, Animal Biology I or 303. Professor KERR. Lectures, M W F 11; one demonstration at an hour to be arranged. *Stimson Amphitheater*.

For students in the biological sciences and for others wishing to obtain a knowledge of the structure of their own bodies. Normal structures of the body, together with its variations and evolution based on development in the individual and the race. Illustrated by specimens, lantern slides, and diagrams.

222. Anatomical Methods. First term. Credit three hours. Prerequisite, Animal Biology I. Previous work in Comparative Anatomy also is recommended. Assistant Professor PAPEZ and instructors. The laboratory is open any morning except Saturday. Lectures, *Stimson* 49; laboratory, *Stimson* 52.

One lecture and nine hours of laboratory a week are required.

225. Comparative Neurology. Second term. Credit three hours. Prerequisite, Animal Biology I and II. Assistant Professor PAPEZ. Hours to be arranged. *Stimson* 52.

A comparative study of the vertebrate nervous system based on dissections of brains of shark and cat, and sections of cat brain stem; the chief nerve mechan-

isms that determine the form and structure of the nervous systems, their evolutionary and functional significance. One lecture and two laboratory periods.

*303. **Elementary Human Physiology.** Repeated in second term. Credit three hours. Dr. DYE, Mr. MAUGHAN, and assistants. First term, M W F 10. Second term, Section A, M W F 10; Section B, M W F 12. Number limited to the capacity of the lecture room. *Stimson 4.*

An introductory course for students of the biological sciences and for students who expect to teach physiology in the secondary schools. The lectures will be fully illustrated by experiments, lantern slides, and diagrams.

306. **Laboratory Work in Physiology.** Repeated in second term. Credit two or more hours. Prerequisite or parallel course, Animal Biology 303. Dr. DYE, Mr. MAUGHAN, and assistants. First term, day and hour to be arranged. Second term, any hour between 10 A. M. and 5:30 P. M. on Tuesday and between 10 A. M. and 1 P. M. on Thursday. *Stimson 28.*

A beginning course in practical physiology.

308. **Advanced Work and Research in Physiology.** Throughout the year. Credit two or more hours. Prerequisite, previous courses in Physiology. Professor ——— and instructors. Hours to be arranged. *Stimson 31.*

314. **Elementary Biochemistry.** First term. Credit three hours. Prerequisite, Chemistry 375 or the equivalent. Assistant Professor SUMNER and Dr. GRAHAM. Lectures, M W 12; conferences, F 12. *Stimson 4.*

The substances met with in living things, and the chief facts of digestion, metabolism, and nutrition. (Courses 314 and 314a will not be accepted for the requirements of biochemistry in the Medical College. Chemistry students are advised to take Biochemistry for Medical Students. See the Announcement of the Medical College.)

314a. **Laboratory Work in Biochemistry.** First term. Credit two hours. Prerequisite or parallel course, Animal Biology 314. Assistant Professor SUMNER and Dr. GRAHAM. M W 2-5. *Stimson 34.*

316. **Advanced Biochemistry Lectures.** Second term. Credit one hour a term. Prerequisite, Animal Biology 314 and 314a. Assistant Professor SUMNER. Hours to be arranged. *Stimson 49.*

320. **Advanced and Research Work in Biochemistry.** Throughout the year. Credit two or more hours. Prerequisite, Animal Biology 314 and 314a. Assistant Professor SUMNER. Hours to be arranged. *Stimson 34.*

For other courses in Biochemistry, see the Announcement of the Medical College.

BOTANY

Students wishing instruction in special groups of plants or in special subjects should consult the department.

*1. **General Botany.** Throughout the year. Credit six hours upon completion of the course, unless excused by the department. Professor PETRY, and Messrs. ARNOLD, BURKHOLDER, LAUBENGAYER, HOTCHKISS, and others. Lectures, T Th 9 or 11. *East Roberts 222.* Laboratory, one period of two and one-half hours. *Stone.* Students must secure assignment to sections at the time of registration.

The fundamental facts and principals of plant life. A careful study of form, structure, and reproduction of representatives of the principal groups. Attention will be given to life processes, particularly in the higher plants. Laboratory fee, \$2.50 a term; deposit, \$3, for the first term only.

13. **Trees and Shrubs.** First term. Credit three hours. Prerequisite, Botany I or the equivalent. Mr. MANNING. Lecture, T 8. *Stone.* Laboratory or field work, M W, or T Th, 2-4:30. One all-day field trip is required. *Stone, Botanical Laboratory.* Students must secure assignment to laboratory sections in the Botany office at the time of registration.

The identification of trees and shrubs, in summer and in winter condition. The laboratory work covering identification will be done largely in the field. The work of the latter part of the term will be a study of the taxonomy of woody

plants. For all students wishing a detailed knowledge of trees and shrubs. Laboratory fee, \$3; deposit, \$3.

117. **Taxonomy of the Higher Plants.** Throughout the year. Credit three hours a term. Prerequisite, Botany I or the equivalent. Professor WIEGAND and ————. Lecture, M 9. Laboratory, M W 2-5. *Stone, Botanical Laboratory.*

A study of the kinds of seed plants and ferns, their classification into genera, families, and orders, and field work on the local flora. Emphasis will be placed on wild plants, but the more common cultivated plants will receive some attention. The course is planned to follow Botany I and to furnish an introduction to the knowledge of field botany and classification of higher plants, in preparation for special work in various departments and as an aid in teaching. Instruction will be given in the preparation of an herbarium and of keys. Laboratory fee, \$2 a term; deposit, second term, \$3.

Students completing this course may arrange, under Botany 145, to pursue advanced work in taxonomy.

[123. **Plant Anatomy.** First term. Credit four hours. Prerequisite, Botany I or its equivalent. Professor EAMES and ————. Not given in 1926-27.]

124. **Cytology.** Second term. Credit four hours. Prerequisite, Botany I or Animal Biology I, and, preferably, Botany 126. Professor SHARP and Miss McCLINTOCK. Conferences, T Th 9. Laboratory, T Th 10-12:30. *Stone 205.*

The subject matter, literature, and problems of cytology. Of value to advanced students in the various branches of biology, especially significant to the geneticist. Discussion of topics suggested by the laboratory observations and assigned reading, and the review of new literature in the conference. Laboratory fee, \$5.

125. **Methods in Histology and Cytology.** Second term. Credit one to three hours. Prerequisite, Botany I or the equivalent, and permission of the instructor to register. M W 2-5. *Stone 302A.* Professor SHARP. Laboratory fee, \$10.

126. **Morphology of Vascular Plants.** First term. Credit four hours. Prerequisite, Botany I or the equivalent. Professors EAMES and PETRY and Miss JACKSON. Lectures, W F 9; laboratory, W F 10-12:30. *Stone 203.*

An advanced course in the comparative morphology and life histories of vascular plants. Laboratory fee, \$5.

131. **Plant Physiology.** Either term. Credit four hours. Prerequisite, Botany I. Professors KNUDSON and CURTIS, Assistant Professor HOPKINS, and Messrs. ————. Lectures and recitations, T Th 10. *Roberts 292.* Laboratory, T Th 2-4:30 or W F 2-4:30. *Stone 21.* Students must secure assignment to laboratory sections at the time of registration.

The general principles of plant physiology. Water relations, photosynthesis, translocation, digestion, respiration, mineral nutrition, growth, and reproduction, studied in detail. Laboratory fee, \$4; deposit, \$2.

219. **Seminary in the Taxonomy of Vascular Plants.** Throughout the year. Professor WIEGAND. Hours to be arranged.

Of particular interest to the taxonomist; current literature problems will constitute a part of the program.

227. **Seminary in Morphology.** Throughout the year. Professors EAMES and SHARP. Hours to be arranged.

231. **Plant Physiology, Advanced Lecture Course.** Throughout the year. Credit three hours a term. Prerequisite, training in botany and chemistry, to be determined in each case by the department. Professors KNUDSON and CURTIS, and Dr. PEARSALL. Lectures, M W F 10. *Stone.* Recommended for seniors and graduate students.

232. **Plant Physiology, Advanced Laboratory Course.** Throughout the year. Credit three hours a term. Prerequisite or parallel course, Botany 231. Professors KNUDSON and CURTIS, and Assistant Professor HOPKINS. Laboratory, M 2-5, S 8-12:30. *Stone 21.* Laboratory fee, \$5; breakage deposit, \$2.

233. **Seminary in Plant Physiology.** Throughout the year. Professors KNUDSON and CURTIS and Assistant Professor HOPKINS. Conference, F 11. *Stone 204.*

Required of graduate students with a major or minor in Physiology. The presentation and discussion of current contributions to plant physiology; reports on the research problems of graduate students and members of the staff.

[141. **History of Botany.** Second term. No credit. F 4:30. Stone 203. A course of lectures given by various members of the staff or advanced students. Not given in 1926-27.]

245. **Special Problems in General Botany, Taxonomy, Histology, and Cytology.** Throughout the year. Credit not less than two hours a term. Professors WIEGAND, EAMES, SHARP, and PETRY, and Assistant Professor MUENSCHER.

Students engaged in special problems or making special studies may register in this course. They must satisfy the instructor under whom the work is taken that their preparation warrants their choice of problem. The laboratory fee depends upon the nature of the work and on the number of credit hours.

251. **General Department Seminary.** Throughout the year. Professor SHARP, assisted by other members of the department. M 4:30.

Broad problems pertaining to botany will be discussed, literature will be reviewed, and reports of research will be given. Required of graduate students taking work in the department.

CHEMISTRY

All courses listed below are to be given in the Baker Laboratory of Chemistry.

INORGANIC CHEMISTRY

*101. **Introductory Inorganic Chemistry.** Lectures. Repeated in the second term. Credit three hours.

Two sections: M W F 11; T Th S 11. *Main Lecture Room.* Professor BROWNE and Assistant Professor MCKINNEY.

Entrance credit in chemistry does not carry with it University credit in Course 101 or 105. If a student entering the University from a preparatory school desires credit for these Courses, he must pass an examination set by the Department of Chemistry. This examination is held in New York City and in Ithaca on the same day in September as the entrance examination. University credit in Courses 101 and 105 that is obtained by passing this examination does not carry with it entrance credit in Chemistry.

Examinations for those who were unavoidably absent from the final examination in course 101 will be held at 2 p. m. on the day before instruction begins in the fall.

*105. **Introductory Inorganic Chemistry.** Recitations and laboratory practice. Repeated in the second term. Credit three hours.

Recitations, one hour a week, to be arranged.

Laboratory sections: M F 2-4:30; T Th 2-4:30; W 2-4:30, S 8-10:30. Room 150. Professor BROWNE, Assistant Professor MCKINNEY, and assistants.

Chemistry 101 and 105 must be taken simultaneously unless permission is obtained by the student from the Dean of his college and from the Department of Chemistry to take either course alone.

130. **Advanced Inorganic Chemistry.** Throughout the year. Credit three hours a term. Prerequisite or parallel courses, Chemistry 405 and 410. Professor DENNIS. M W F 11. *Baker 107.*

Lectures. The chemical elements are discussed in the order in which they occur in the Periodic Table of Mendeléeff, with special attention to the group properties of the elements and to the relations of the groups to one another. The rare elements and the rare earths are treated in as great detail as are the more common elements.

135. **Advanced Inorganic Chemistry.** Either term. Credit one to six hours. Prerequisite, Chemistry 305 and 310. Professors DENNIS and BROWNE and assistants. Day and hour to be arranged. *Baker 178 and 122.*

Laboratory practice. The preparation, purification, properties, and reactions of inorganic compounds including those of the rarer elements.

Chemistry 135 is designed to accompany Chemistry 130, but either course may be taken separately.

140. **Selected Topics in Advanced Inorganic Chemistry.** Second term.

Credit two hours. Prerequisite, or parallel courses, Chemistry 405 and 410. Professor BROWNE. Not given 1926-27].

195. **Research for Seniors.** Throughout the year. Professors DENNIS and BROWNE and Assistant Professor MCKINNEY. See page 17.

ANALYTICAL CHEMISTRY

205. **Introductory Qualitative Analysis.** Repeated in the second term. Credit three hours. Prerequisite, Chemistry 101 and 105. Must be taken with Course 206. Assistant Professor NICHOLS, Dr. COREY, and assistants.

Lectures: Assistant Professor NICHOLS, M W 9. *Baker 107.*

Recitations: one hour a week, to be arranged.

A study of the application of the theories of general chemistry to the systematic separation and detection of the common elements and acid radicals.

Students in science are advised, and candidates for the degree of Bachelor of Chemistry are required, to take this course together with Course 206 instead of Course 210.

206. **Introductory Qualitative Analysis.** Repeated in the second term. Credit three hours. Prerequisite, Chemistry 101 and 105. Must be taken with Course 205. Assistant Professor NICHOLS, Dr. COREY, and assistants.

Laboratory section: M W F 2-4:30. *Baker 50.*

Laboratory practice. A study of the properties and reactions of the common elements and acid radicals; the qualitative analysis of a number of solutions and solid compounds.

Students in science are advised, and candidates for the degree of Bachelor of Chemistry are required, to take this course together with Course 205 instead of Course 210.

*210. **Introductory Qualitative Analysis.** Shorter course. Repeated in the second term. Credit three hours. Prerequisite, Chemistry 101 and 105. Dr. COREY and assistants.

Lectures: Dr. COREY. T 12. *Baker 207.*

Laboratory sections: T Th 8-10:30; T Th 2-4:30. *Baker 50.*

The properties and reactions of the common elements and acids; their detection in various liquid and solid mixtures.

215. **Advanced Qualitative Analysis.** Second term. Credit one, two, or three hours. Prerequisite, Chemistry 220, 221, 305, and 310. Assistant Professor NICHOLS, Dr. COREY, and assistants. Day and hour to be arranged. *Baker 50.*

Laboratory practice. Essentially a continuation of Course 206. The methods for separating and detecting a number of metals and acids not studied in Course 206, including many of the rare elements. The qualitative analysis of a number of solutions, solid mixtures, natural and commercial products will be required. For graduates and advanced undergraduates.

220. **Introductory Quantitative Analysis.** Repeated in the second term. Credit three hours. Prerequisite, Chemistry 205 and 206. Must be taken with Course 221. Assistant Professor NICHOLS, Mr. TUCKER, and assistants.

Lectures: Assistant Professor NICHOLS. T Th 9. *Baker 207.*

Recitations: one hour a week, to be arranged.

A study of the fundamental principles of gravimetric and volumetric analysis with practice in stoichiometry.

Students in science are advised, and candidates for the degree of Bachelor of Chemistry are required, to take this course together with Course 221 instead of Course 225.

221. **Introductory Quantitative Analysis.** Repeated in the second term. Credit three hours. Prerequisite, Chemistry 205 and 206. Must be taken with Course 220. Assistant Professor NICHOLS, Mr. TUCKER, and assistants.

Laboratory Sections: First term, M T W 2-4:30; T Th 10-12:30, S 8-1; second term, W Th F 2-4:30; T Th 10-12:30; S 8-1. *Baker 252.*

Laboratory practice in the preparation and standardization of various volumetric solutions and the analysis of a variety of substances by volumetric and gravimetric methods.

Students in science are advised, and candidates for the degree of Bachelor of

Chemistry are required, to take this course together with Course 220 instead of Course 225.

*225. **Introductory Quantitative Analysis.** Shorter course. Repeated in the second term. Credit three hours. Prerequisite or parallel course, Chemistry 210. Mr. TUCKER and assistants.

Lecture: Mr. TUCKER. Th 12. *Baker 207.*

Laboratory sections: T Th 8-10:30; T Th 9-11:30; M W 2-4:30; T Th 2-4:30. *Baker 252.*

A study of the fundamental principles of quantitative and volumetric analysis. 230. **Advanced Quantitative Analysis.** Repeated in the second term. Credit four hours. Prerequisite, Chemistry 220 and 221. Assistant Professor NICHOLS, Mr. TUCKER and assistants.

Recitation: one hour a week, to be arranged.

Laboratory periods: first term, M T W 2-4:30; T Th 9-11, S 8-11; second term, M T W Th F 2-4:30, T Th S 8-11. *Baker 277 and 294.* Students will be assigned to a combination of laboratory periods that will total seven and one-half hours a week.

Gravimetric, volumetric, and electrolytic methods of analysis, and methods of combustion analysis; the calibration of weights and volumetric apparatus; analysis of iron and steel, alloys, silicates, etc.

235. **Advanced Quantitative Analysis.** Second term. Credit two hours. Prerequisite, first term of Chemistry 405. Assistant Professor NICHOLS. M W 12. *Baker 207.*

Lectures: Selected topics in advanced quantitative analysis, stoichiometry.

240. **Electrochemical Analysis.** Repeated in the second term. Credit one or two hours. Prerequisite, Chemistry 230 and 405. Assistant Professor NICHOLS and Mr. TUCKER. Day and hour to be arranged. *Baker 292.*

Laboratory practice. The most approved electrochemical methods for the determination of silver, lead, copper, tin, nickel, cobalt, and zinc; practice in the analysis of alloys and ores.

245. **Assaying.** First term. Credit two hours. Prerequisite, Chemistry 225 (or 220 and 221), and, if possible, a course in mineralogy. Mr. TUCKER and assistants.

Lecture: Mr. TUCKER. M 9. *Baker 202.*

Laboratory sections: M 2-4:30; W 2-4:30. *Baker B-91 and B-96.*

Lectures on the theory and practice of scorification and crucible assay, and on the metallurgy of copper, lead, zinc, silver, and gold; laboratory practice in the assay of zinc, lead, copper, gold and silver ores, mattes, and bullion. Designed for students in Chemistry and Geology, and as an elective in Mechanical and Civil Engineering.

250. **Gas and Fuel Analysis.** Repeated in the second term. Credit four hours. Prerequisite, Physics 5. Open to those who have completed or are taking Chemistry 220 and 221. Mr. MORSE and assistants.

Lectures: Mr. MORSE. M W 11. *Baker 207.*

Laboratory sections: M T 2-4:30; W Th 2-4:30; T Th 10-12:30; S 8-11. *Baker 282.*

The complete analysis of coal gas, flue gas, and air; the determination of the heating power of gaseous, liquid, and solid fuels; the analysis of coal; standard methods of testing various petroleum and coal-tar products; the analysis of various substances by methods involving the use of different types of gas evolution apparatus. Problems are assigned which afford practice in the calculation and interpretation of results.

255. **Advanced Gas Analysis.** First term. Credit two hours. Prerequisite, Chemistry 250. Assistant Professor NICHOLS. M W 12. *Baker 207.*

Lectures. A presentation of important methods and a discussion of special forms of apparatus used in scientific gas analysis.

260. **Advanced Gas Analysis.** Either term. Credit two hours. Prerequisite, Chemistry 250. Assistant Professor NICHOLS, Mr. MORSE, and assistants. Day and hour to be arranged. *Baker 282.*

Laboratory practice. The use of special forms of apparatus; practice in the

design and construction of apparatus for scientific investigation in this field. Course 260 is designed to accompany Course 255, but either course may be taken separately.

270. **Special Methods of Quantitative Analysis.** Either term. Credit two, three, or four hours. Prerequisite, Chemistry 230 and 235. Assistant Professor NICHOLS and assistants. Day and hour to be arranged. *Baker 277.*

Laboratory practice in the application of special methods such as indirect analysis, conductivity, electrometric titrations, etc., to quantitative analysis, and the analysis of special steels, ores, slags, alloys, etc.

Within certain limits the work may be selected to suit the requirements of the individual student.

295. **Research for Seniors.** Throughout the year. Assistant Professor NICHOLS, and Dr. COREY. See page 17.

ORGANIC CHEMISTRY

305. **Introductory Organic Chemistry.** Throughout the year. Credit three hours a term. Prerequisite, Chemistry 210 and 225 (or 205, 206, 220 and 221) Open to those who are taking Course 220. Professor ORNDORFF and Mr. BEACH. M W 9, *Baker 207*; F 9, *Baker, Main Lecture Room.*

Lectures and written reviews. The more important compounds of carbon, their occurrence, methods of preparation; relations and uses; illustrated by experiments and material from the museum.

310. **Introductory Organic Chemistry.** Throughout the year. Credit three hours a term. Prerequisite or parallel course, Chemistry 305. Professor ORNDORFF, Mr. BEACH, and assistants. Laboratory sections: M T 2-4:30; T 10-12:30; F 2-4:30; S 8-1. *Baker 250.*

Laboratory practice and oral reviews. The student prepares a large number of typical compounds of carbon and familiarizes himself with their properties, reactions, and relations. The detection of inorganic elements in organic compounds and the recognition of various groups of radicals, with the identification of unknown compounds, is included in the laboratory work.

315. **Advanced Organic Chemistry.** Throughout the year. Credit two hours a term. Prerequisite, Chemistry 305 and 310. Professor ORNDORFF and Mr. BEACH. T Th 9. *Baker 206.*

Lectures. A presentation of important chapters of organic chemistry and a discussion of classical researches in this field.

320. **Advanced Organic Chemistry.** Either term. Credit two to six hours a term. Prerequisite or parallel course, Chemistry 315. Professor ORNDORFF, Mr. BEACH and assistants. Day and hour to be arranged. *Baker 208.*

Laboratory practice. An advanced course in the preparation of organic compounds. The original literature is consulted, and before taking up original work in this field, the student is required to repeat some extended and important piece of work, and to compare his results with those published.

325. **The Coal Tar Dyestuffs.** First term. Credit one hour. Prerequisite or parallel course, Chemistry 315. Professor ORNDORFF. F 11. *Baker 206.*

Discussion of methods of manufacture of intermediates and dyestuffs, and of their properties, constitution, and relationships. The treatment is scientific rather than technical.

330. **The Coal Tar Dyestuffs.** Either term. Credit two to four hours a term. Prerequisite or parallel course, Chemistry 325. Professor ORNDORFF and Mr. BEACH. Day and hour to be arranged. *Baker 208.*

Laboratory practice. Preparation of various intermediate products used in the manufacture of dyes, and of representatives of the different groups of dyestuffs.

[335. **Stereochemistry.** Second term. Credit one hour. Prerequisite, Chemistry 305. Professor ORNDORFF. F 11. *Baker 206.* Not given '1926-27.]

340. **Methods of Organic Analysis.** Either term. Credit two to six hours a term. Prerequisite, Chemistry 305 and 310. Professor ORNDORFF and Mr. BEACH. Day and hour to be arranged. *Baker 208.*

Laboratory practice in the qualitative and quantitative analysis of commercial

organic products such as alcohols, ethers, organic acids, glycerin, formalin, acetates, coal tar distillates, petroleum products, soaps, acetanilide, etc.

375. Elementary Organic Chemistry. First term. Lectures and written reviews only, four hours credit; with laboratory, five to six hours credit. Students who are preparing for the study of medicine must take the entire six hours. Prerequisite, Chemistry 210 and 225 (or 205, 206, 220 and 221). Open to those who are taking course 220. Mr. BEACH and assistants.

Lectures and written reviews, Mr. BEACH. M W F S 12. *Baker, Main Lecture Room.*

Laboratory section and oral reviews, M W 2-4:30. *Baker 250.*

395. Research for Seniors. Throughout the year. Professor ORNDORFF. See page 17.

PHYSICAL CHEMISTRY

405. Introductory Physical Chemistry. Throughout the year. Credit three hours a term. Prerequisite, Chemistry 305 (or 375) and Physics 5 and 31. Professor BRIGGS. M W F 9. *Baker 7.*

Lectures. A systematic presentation of modern chemical theory in which special attention is paid to the following topics: Gases, liquids, and solids; the theory of solution; reaction velocity, catalysis, and chemical equilibrium; the Phase Rule; colloid chemistry; thermochemistry; and elementary electrochemistry. Problems in physical chemistry.

It is advisable, but not obligatory, that course 410 accompany this course.

410. Introductory Physical Chemistry. Throughout the year. Credit three hours a term. Prerequisite or parallel course, Chemistry 405. Professor BRIGGS and assistants. Laboratory sections: M T 2-4:30; S 8-1. *Baker 1.*

Laboratory practice. Qualitative and quantitative experiments illustrating the principles of physical chemistry and including practice in performing physico-chemical measurements. An important feature of this course is the presentation of detailed reports based upon data obtained in the laboratory.

415. Advanced Physical Chemistry. Throughout the year. Credit two hours a term. Prerequisite, Chemistry 405. Professor BANCROFT. T Th 11. *Baker 7.*

An exposition of the law of mass action in its application to chemical equilibrium and reaction velocities.

430. Applied Colloid Chemistry. Throughout the year. Credit two hours a term. Open to candidates for the degree of Bachelor of Chemistry if they have completed Chemistry 405, to others only by special permission. Professor BANCROFT. T Th 10. *Baker 7.*

Lectures. The theory of colloid chemistry and its application in the arts.

450. Applied Electrochemistry. Throughout the year. Credit two hours a term. Prerequisite, Chemistry 405. Professor BRIGGS. M W 12. *Baker 7.*

Lectures. The theory of electrolysis and electromotive force; electrolytic extraction and refining of metals; electrolytic manufacture of organic and inorganic compounds; theory and practice of storage cells; preparation of compounds in the electric furnace. Problems in electrochemistry.

455. Applied Electrochemistry. Throughout the year. Credit two hours a term. Prerequisite or parallel course, Chemistry 450. Professor BRIGGS and assistant. Day and hour to be arranged. *Baker 1-A.*

Laboratory practice. Qualitative and quantitative study of electrolysis; determination of electrical conductivity; potentiometric measurements; hydrogen ion concentration; determination of current and energy efficiencies in electrolytic and electrothermal work; electrolytic preparation of organic and inorganic compounds; tests of storage cells; preparation of compounds in the electric furnace; measurement of furnace temperatures.

[**460. Theoretical Electrochemistry.** Throughout the year. Credit two hours a term. Prerequisite, Chemistry 405. Professor BANCROFT. Not given in 1926-27.]

465. Advanced Physical Chemistry. Either term. Credit variable, but not to exceed six hours a term. Prerequisite, determined in each case by the professor

in charge. Professors BANCROFT and BRIGGS and assistants. Hour and work to be arranged. *Baker 94.*

Laboratory practice. Students may elect in mass law, reaction velocity, or efficiency measurements with special reference to course 415; in photo-chemistry, photography, or colloid chemistry with special reference to course 430 in conductivity, or electrometric determinations with special reference to course 460; in electrolytic, or electric furnace products with special reference to course 450; in the application of physical chemical methods to organic chemistry.

495. **Research for Seniors.** Throughout the year. Professors BANCROFT and BRIGGS. See page 17.

OPTICAL CHEMISTRY

505. **Introductory Chemical Spectroscopy.** Repeated in the second term. Credit three hours. Prerequisite, Chemistry 210 and 225 (or 205, 206, 220 and 221.) Open to those who have completed or are taking Physics 31. Assistant Professor PAPISH and assistants.

Lectures and written reviews. Assistant Professor PAPISH. T Th 8. *Baker 377.*

Laboratory sections: M W Th F 2-4:30; *Baker 392 and 396.*

The construction and the use in chemical analysis of the spectroscope, polariscope, refractometer, colorimeter, and nephelometer. The laboratory instruction is devoted to the training of the student in the use of these instruments in the solving of chemical problems.

510. **Advanced Chemical Spectroscopy.** Either term. Credit two or more hours. Prerequisite, Chemistry 505. Assistant Professor PAPISH and assistants. Day and hour to be arranged. *Baker 396.*

Laboratory practice. The study of arc, spark, and absorption spectra and the application of spectroscopic methods to the identification of dyestuffs. Practice in one or more of the subjects mentioned may be selected by the student.

520. **Spectrographic Methods.** Either term. Credit one or more hours. Prerequisite, Chemistry 505. Assistant Professor PAPISH. Laboratory hours to be arranged. *Baker 396.* Conference, Th 12. *Baker 377.*

Laboratory practice. The application of photographic methods to arc, spark and absorption spectroscopy. Practice is also given in the application of ultra-violet spectroscopy in chemical analysis.

525. **Special Methods in Optical Chemistry.** First term. Credit two hours. Prerequisite, Chemistry 505. Assistant Professor PAPISH.

Lectures, Assistant Professor PAPISH. F 9. *Baker 377.*

Laboratory, hours to be arranged. *Baker 392.*

Lectures, demonstrations, and laboratory practice. Special optical instruments as applied to the solution of problems arising in the chemical industries and in research; modifications of commonly employed polarimeters, refractometers, nephelometers, colorimeters, glarimeters, etc., as employed in specific industries.

530. **Introductory Chemical Microscopy.** Repeated in the second term. Credit three hours. Prerequisite, Chemistry 210 and 225 (or 205, 206, 220 and 221) and Physics 31 or by special permission. Professor CHAMOT, Dr. MASON and assistants.

Lecture: Professor CHAMOT. First term, M 12; second term, M 10. *Baker 377.*

Laboratory sections: M T 2-4:30; T Th 10-12:30; Th F 2-4:30. *Baker 378.*

Lectures and laboratory practice. The use of the microscope and its accessories; microscopic methods as applied to chemical and other scientific investigations; micrometry; the examination of crystalline compounds and industrial materials; recognition of textile and paper fibers, etc. The application of microscopic methods to quantitative analysis.

535. **Advanced Chemical Microscopy.** Repeated in the second term. Credit three or more hours. Prerequisite, Chemistry 530. Professor CHAMOT, Dr. MASON, and assistants. Laboratory periods: M T Th F 2-5, T Th 10-1. *Baker 378.* Conference, T 12. *Baker 377.*

Laboratory practice in the examination and analysis of inorganic substances

containing the more common elements with special reference to rapid qualitative methods and to the analysis of minute amounts of material.

540. **Advanced Chemical Microscopy.** Second term. Credit two hours. Prerequisite, Chemistry 530. Professor CHAMOT, Dr. MASON, and assistants. Day and hour to be arranged. *Baker 378.*

Laboratory practice. Organic qualitative microscopic analysis as applied to the detection of common commercial organic compounds, vegetable alkaloids, "strong drugs," etc., with particular emphasis upon the analysis of minute quantities of material.

In this course work may be elected in the microscopy of textile or paper fibers.

542. **Special Methods in Chemical Microscopy.** Second term. Credit two hours. Prerequisite, Chemistry 530. Professor CHAMOT and Dr. MASON. W F 9. *Baker 377.*

Lectures and demonstrations. A discussion of microscopic methods as applied to the solution of industrial and research problems. Microscopes of special and unusual construction, such as ultramicroscopes, supermicroscopes, luminescence microscopes, long distance microscopes, etc.; their uses and their limitations.

545. **Microscopy of Commercial Alloys.** Second term. Credit two hours. Prerequisite, Chemistry 530 or by special permission. Professor CHAMOT, Dr. MASON and assistants. Th F 2-4:30. *Baker 384.*

Laboratory practice. An introduction to the methods employed in the microscopic examination of metals, alloys, and other metallurgical products; practice in grinding, polishing, and etching specimens for microscopic study; metallographic microscopes and their use.

This course may be extended to include other materials of construction.

550. **Microscopy of Foods and Beverages.** First term. Credit two hours. Prerequisite, Chemistry 530. Professor CHAMOT, Dr. MASON, and assistants. Laboratory hours to be arranged. Not given in 1926-27.]

555. **Introductory Photomicrography.** Second term. Credit two or more hours. Prerequisite, Chemistry 530. Professor CHAMOT and Dr. MASON. Laboratory practice. Not given in 1926-27.]

595. **Research for Seniors.** Throughout the year. Professor CHAMOT, Assistant Professor PAPISH, and Dr. MASON. See page 17.

SANITARY CHEMISTRY

605. **Introductory Sanitary Chemistry (Foods).** First term. Credit two hours. Prerequisite, Chemistry 305 (or 210, 225 and 375). Dr. GEORGIA. T Th II. *Baker 377.*

Lectures. Chemistry of foods, beverages, and food accessories; special apparatus; adulteration and misbranding, sweeteners, preservatives, food colors, food poisonings, and methods for their detection. Relation of the chemical composition of materials used in the household to the public health. Garbage disposal.

It is advisable, but not obligatory, that Course 610 accompany this course.

610. **Introductory Sanitary Chemistry (Foods).** First term. Credit two hours. Prerequisite or parallel course, Chemistry 605. Dr. GEORGIA and assistant. Laboratory sections at hours to be arranged. *Baker 352.*

Laboratory practice. Laboratory exercises designed to illustrate the material presented in course 605. General and special methods of analysis of foods, beverages, and food accessories with special reference to the detection of adulteration. The use of saccharimeters, refractometers, cryoscopes, muffle furnaces, vacuum ovens, etc.

615. **Introductory Sanitary Chemistry (Water).** Second term. Credit two hours. Prerequisite, Chemistry 305 (or 210, 225 and 375). Dr. GEORGIA. T Th II. *Baker 377.*

Lectures. Pollution of water; physical, chemical, bacteriological, and microscopical examination of water for household and municipal purposes; examination of sewage and sewage effluents; introduction to the methods of water purification, water softening, and sewage disposal, and their control. Interpretation of analytical results and the preparation of sanitary surveys.

It is advisable, but not obligatory, that Course 620 accompany this course.
620. Introductory Sanitary Chemistry (Water). Second term. Credit two hours. Prerequisite or parallel course, Chemistry 615. Dr. GEORGIA and assistant. Laboratory sections at hours to be arranged. *Baker 352.*

Laboratory practice. Laboratory exercises designed to illustrate the material presented in Course 615.

[**630. Advanced Sanitary Chemistry (Water).** First term. Credit two hours. Prerequisite, Chemistry 615. Dr. GEORGIA.

Laboratory practice to accompany this course may be elected under Course 635. Not given in 1926-27.]

635. Advanced Sanitary Chemistry. Either term. Credit two or more hours. Prerequisite, to be determined in each case by the instructor in charge. Dr. GEORGIA and assistant. Day and hour to be arranged. *Baker 352, 356, 358.*

Laboratory practice.

Students who have had adequate preparation may elect work in any branch of sanitary chemistry. Among others, work along the following lines may be taken:

The bacteriology of water.

Continuation of work offered in courses 610 or 620.

The control of water purification.

Water softening.

Disinfectants, etc.

The work in many cases may be arranged to meet the needs of the individual student.

640. Sanitary Chemistry (Disinfectants). Second term. Credit two hours. Prerequisite, Chemistry 305 (or 375). Dr. GEORGIA. T Th 9. *Baker 377.*

Lectures. Standardization, chemical properties, methods of application, and proper choice of disinfectants and other agents used in combating the spread of disease.

695. Research for Seniors. Throughout the year. Dr. GEORGIA. See page 17.

INDUSTRIAL CHEMISTRY

705. Industrial Chemistry. Throughout the year. Credit three hours a term. Prerequisite, Chemistry 405. Professor RHODES. M W F 10. *Baker 177.*

Lectures. A discussion of various typical processes of chemical manufacturing from the standpoint of: (a) available materials, their properties and limitations; (b) standard forms of apparatus used in chemical manufacturing; (c) properties and specifications of commercial chemicals; (d) computation of costs and profits in chemical manufacturing.

By special permission, candidates for the degree of Bachelor of Chemistry may be permitted to register for Course 705 in their junior year and to postpone a part of their elective hours until the senior year.

710. Industrial Chemistry. Second term. Credit three hours. Prerequisite, Chemistry 405. Professor RHODES, Dr. JOHNSON, and assistants. Day and hour to be arranged. *Baker B-78.*

Laboratory practice. The study in the laboratory, on a semi-plant scale, of processes and materials used in the chemical industries.

715. Selected Topics in Industrial Chemistry. Second term. Credit three hours. Prerequisite or parallel course, Chemistry 705. Professor RHODES. M W F 11. *Baker 177.*

Lectures. A discussion of special topics in industrial chemistry. The lectures in 1926-27 will deal with the theory and design of chemical plant equipment for distillation, evaporation, drying, etc.

725. The Chemistry of Fuels. First term. Credit three hours. Prerequisite or parallel course, Chemistry 705. Professor RHODES. M W F 11. *Baker 177.*

Lectures. The chemistry of coal, coke, petroleum, tars and the fuel gases. Particular stress is laid upon the theoretical chemistry involved in the carbonization of coal, the gasification of coal, and the distillation and refining of petroleum and tar.

730. Chemical Plant Design. Repeated in the second term. Credit three

hours. Prerequisite, Chemistry 705. Professor RHODES and Dr. JOHNSON. Day and hour to be arranged.

Conferences and calculation periods. Practice in the calculation and design of chemical plant equipment.

*775. **Engineering Chemistry.** Repeated in the second term. Credit two hours. Prerequisite, Chemistry 101. Not open to students who are candidates for the degree of Bachelor of Chemistry. Dr. JOHNSON. M W 8. *Baker, Main Lecture Room.*

Lectures. Chemistry in its relations to engineering.

776. **Chemistry of Pulp and Paper.** Second term. Credit two hours. Prerequisite, Chemistry 775. Open to students in Forestry, to others only by special permission. Dr. JOHNSON. T Th 10. *Baker 177.*

Lectures. The chemistry of the manufacture of pulp and paper.

795. **Research for Seniors.** Throughout the year. Professor RHODES and Dr. JOHNSON. See page 17.

AGRICULTURAL CHEMISTRY

805. **Introductory Agricultural Chemistry (Fertilizers, Insecticides, Soils).** First term. Credit two hours. Prerequisite, Chemistry 305 (or 375). Professor CAVANAUGH. T Th 11. *Baker 107.*

Lectures. The relation of chemistry to agriculture; an introduction to the study of plant growth, the composition and chemical properties of soils, fertilizers, amendments, insecticides, and fungicides.

810. **Introductory Agricultural Chemistry.** First term. Credit two hours. Prerequisite, Chemistry 205 and 220 (or 210 and 225). Professor CAVANAUGH, Mr. MISCALL, and assistant. Day and hour to be arranged. *Baker 350.*

Laboratory practice. Practice in the methods used by the chemist in the control laboratories of the factory, of the Government, and of the Experiment Stations, where fertilizers, insecticides, fungicides, and soils are examined.

815. **Introductory Agricultural Chemistry (Foods and Feeds).** Second term. Credit two hours. Prerequisite, Chemistry 305 (or 375). Professor CAVANAUGH. T Th 11. *Baker 107.*

Lectures. Discussion of the sources, chemical composition, and properties of the principal foods and feeds such as cereals, fruits, animal products, and dairy products. Relation of methods of preservation and manufacture to the nutritive value of foods.

820. **Introductory Agricultural Chemistry.** Second term. Credit two hours. Prerequisite, Chemistry 205 and 220 (or 210 and 225). Professor CAVANAUGH, Mr. MISCALL, and assistant. Day and hour to be arranged. *Baker 350.*

Laboratory practice. The methods of the Association of Official Agricultural Chemists are used in the examination and analysis of foods and feeding stuffs, such as milk and milk products, cereal products, canned vegetables, etc.

835. **Advanced Agricultural Chemistry (Fertilizers, Insecticides, Soils).** Either term. Credit two or more hours. Prerequisite, Chemistry 810. Professor CAVANAUGH and Mr. MISCALL. Day and hour to be arranged. *Baker 350.*

Laboratory practice. Advanced work in the chemistry of soils, fertilizers, plant composition, insecticides, or fungicides. Special topics may be selected.

840. **Advanced Agricultural Chemistry (Foods and Feeds).** Either term. Credit two or more hours. Prerequisite, Chemistry 820. Professor CAVANAUGH and Mr. MISCALL. Day and hour to be arranged. *Baker 350.*

Laboratory practice. Special topics in the chemistry of foods and food preparations.

*875. **Elementary Agricultural Chemistry.** Second term. Credit three hours. Prerequisite, Chemistry 101. Professor CAVANAUGH. M W F 12. *Baker 377.* Candidates for the degree of Bachelor of Chemistry may not receive credit for this course toward the degree.

Lectures. The relation of chemistry to agriculture, and an introduction to the study of the composition and chemical properties of plants, fertilizers, feed stuffs, insecticides, and fungicides.

*880. **Elementary Chemistry of Food Products.** Second term. Credit two hours. Prerequisite, Chemistry 101. Professor CAVANAUGH. W F 10. *Baker 377.* Candidates for the degree of Bachelor of Chemistry may not receive credit for this course toward the degree.

Lectures. The chemical composition, physical and physiological properties, sources, and methods of manufacture of the principal food products.

895. **Research for Seniors.** Throughout the year. Professor CAVANAUGH. See page 17.

SEMINARY

905. **Seminary.** Credit one hour. M 5. *Baker 107.*

For seniors who are candidates for the degree of Bachelor of Chemistry.

1000. **Selected Topics in Inorganic Chemistry.** First term. Credit two hours. Professor FRITZ PANETH, University of Berlin. T Th 4:30. *Baker 107.*

Seniors in the course in chemistry may elect these lectures, and juniors may do so on special permission.

THE CLASSICS

ARCHAEOLOGY, GREEK ART AND ANTIQUITIES

A. **Greek Art.** November to March inclusive. Professor ANDREWS. Th 4:30. *Goldwin Smith Museum of Casts.*

An introductory course of popular illustrated lectures on Greek sculpture, Greek antiquities, and Greek topography. Planned and timed especially to meet the needs of students in the technical and professional colleges, but open to all students and to the public. No university credit.

1. **History of Greek Sculpture.** Repeated in second term. Credit three hours. Professor ANDREWS. First term, M W F 9; second term, M W F 11. *Goldwin Smith Museum of Casts.*

Intended to be supplemented by course 3, but may be taken separately.

3. **Greek Antiquities.** Repeated in second term. Credit three hours. Professor ANDREWS. First term, M W F 11; second term, M W F 9. *Goldwin Smith Museum of Casts.*

Pre-Greek art and civilization; Greek terra cottas, bronzes, pottery, and gems. Illustrated by the material in the Museum of Casts and by stereopticon views. Intended to be taken with course 1, but may be taken separately.

4a. **Greek Coins.** First term. Credit two hours. Professor ANDREWS. T Th 11. *Goldwin Smith Museum of Casts.*

4b. **Greek Architecture.** Second term. Credit two hours. Professor ANDREWS. T Th 11. *Goldwin Smith Museum of Casts.*

5. **Pausanias.** Throughout the year. Credit two hours a term. Prerequisite, facility in reading Greek. Professor ANDREWS. Hours to be arranged after consultation. *Goldwin Smith 35.*

A reading course in the sources of knowledge of Greek topography with special reference to Athens, supplemented by illustrated lectures and by reading from Thucydides and Herodotus.

6. **Greek Epigraphy.** Credit two hours. Prerequisite, facility in reading Greek. Professor ANDREWS. Hours to be arranged after consultation. *Goldwin Smith 35.*

A study of Greek alphabets and inscriptions, chiefly from the large collection of squeezes owned by the department. For graduates and qualified undergraduates.

7. **Modern Greek.** Credit two hours. Prerequisite, facility in reading Greek. Professor ANDREWS. Hours to be arranged after consultation. *Goldwin Smith 35.*

Primarily for those expecting to study in Athens. The literary language and the colloquial idiom. Athenian newspapers and stories in the vernacular will be read.

GREEK

*1a. **Greek for Beginners: Introduction to Homer's Iliad.** Repeated in second term. Credit three hours. First term: Section 1, Assistant Professor

CAPLAN, M W F 12, *Goldwin Smith** 124; Section 2, Professor JONES, T Th S 10, *Goldwin Smith* 128. Second term: Section 1, Assistant Professor CAPLAN, M W F 12, *Goldwin Smith* 124; Section 2, Professor JONES, T Th S 11, *Goldwin Smith* 124.

*1b. **Homer's Iliad.** Continuation of Greek 1a. Repeated in second term. Credit three hours. Prerequisite, Greek 1a. First term: Professor MOUNTFORD, M W F 10, *Goldwin Smith* 120. Second term, Professor JONES, M W F 12, *Goldwin Smith* 120.

*2a. **New Testament; Euripides, Alcestis.** First term. Credit three hours. Prerequisite, Greek 1b or its equivalent. Professor JONES. M W F 10. *Goldwin Smith* 128.

*2b. **Herodotus; Plato.** Second term. Credit three hours. Prerequisite, Greek 1b or 2a. Assistant Professor CAPLAN. M W F 10. *Goldwin Smith* 128.

4. **Greek Composition.** Throughout the year. Credit one hour. Prerequisite, Greek 1b or its equivalent. Professor JONES. T 12. *Goldwin Smith* 124.

[7. **Myths of the Epic Cycle.** Second term. Credit two hours. Professor JONES. Not given in 1926-27.]

17. **Sophocles, Oedipus Rex; Demosthenes, Philippics; Aristophanes, Wasps; Thucydides, Book II.** Throughout the year. Credit three hours a term. Prerequisites, Greek 2b or Greek 19 (1925-26). First term, Assistant Professor CAPLAN, Second term, Professor MOUNTFORD. T Th S 11. First term, *Goldwin Smith* 124; second term, *Goldwin Smith* 120.

[19. **Comedy and Pastoral Poetry.** Second term. Credit three hours. Professor JONES. Not given in 1926-27.]

[20. **Aeschylus, Agamemnon; Plato, Republic, Tenth Book.** First term. Credit three hours. Professor JONES. Not given in 1926-27.]

[21. **Lyric Poetry, especially Pindar.** First term. Credit three hours. Professor JONES. Not given in 1926-27.]

30. **Lectures on Greek Literature: Greek Tragedy and Comedy.** First term. Credit two hours. Professor MOUNTFORD. T Th 9, *Goldwin Smith* 120.

Open to those who have taken or are taking Greek 1b. Other students will be admitted by permission of the instructor.

[31. **Lectures on Greek Literature, Epic and Lyric Poetry.** Professor MOUNTFORD. Not given in 1926-27.]

[33. **Greek Oratory and Rhetoric.** Assistant Professor CAPLAN. Not given in 1926-27.]

35. **The Republic of Plato.** Throughout the year. Credit three hours a term. Professor HAMMOND. See Philosophy, Course 27.

40. **Greek Seminary.** Throughout the year. Professor JONES. T 2, and another hour to be arranged. For graduates only.

English Translation of Greek and Latin Classics. Professor COOPER. See English, Course 71.

Methods of Literary and Linguistic Study. Professor COOPER. See English, Course 75.

Greek History. Professor LAISTNER. See History, 1 and 6.

LATIN

*1a. **Freshman Course: for students offering three units of entrance Latin.** Throughout the year. Credit three hours a term. First term, Assistant Professor CAPLAN. T Th S 10, *Goldwin Smith* 124. Second term, Professor MOUNTFORD, T Th S 10, *Goldwin Smith* 120.

Ovid; Virgil; Horace, Odes and Epodes.

*1. **Freshman Course: for students offering four units of entrance Latin.** Throughout the year. Credit three hours a term. Section 1, Professor ELMER, M W F 10, *Goldwin Smith* 124; Section 2, Professor MOUNTFORD, M W F 9, *Goldwin Smith* 120; Section 3, Assistant Professor CAPLAN, M W F 11, *Goldwin Smith* 120.

Sallust, *Bellum Catilinae*; Cicero, *De Senectute*; Horace, Odes and Epodes.

[2. **Sight Translation: Gellius: Ovid.** Professor ELMER.

Courses 2 and 3 are given in alternate years. Not given in 1926-27.]

*3. **Sight Translation. Caesar, Civil War; Phaedrus.** Throughout the year.

One hour a term. Professor ELMER. First term, Th 2, Second term, Th 2 and S 12. *Goldwin Smith 124.*

Especially recommended as collateral work for those who are taking Course I or Ia, but open to all students. Courses 2 and 3 are given in alternate years.

[7. **Classic Myths in English Literature.** First term. Credit two hours. Professor DURHAM. Not given in 1926-27.]

*8. **Terence; Horace, Satires and Epistles; Tacitus, Agricola; Virgil, Georgics; Catullus; Livy; Seneca, Epistles; Latin Elegy; Martial.** Second term. Credit three hours. Prerequisite, Latin I or Ia. Professor DURHAM. T Th S 9. *Goldwin Smith 128.*

These works are divided into two groups given in alternate years.

11. **Selections from Cicero's Letters; Cicero, De Oratore, Book I.** Throughout the year. Credit, first term 3 hours; second term, 2 hours. Prerequisite, Latin I or Ia. Professor ELMER. First term, M W F 11; second term, W F 11, *Goldwin Smith 124.*

[12. **Selections from the last Six Books of Virgil's Aeneid; Cicero, De Officiis.** Throughout the year. Credit two hours a term. Not given in 1926-27.]

16. **The Greater Republican Writers.** Throughout the year. Credit three hours a term. Prerequisites, Latin 8, 11, or 12. First term, Professor MOUNTFORD; Second term, Professor DURHAM. T Th S 10. First term, *Goldwin Smith 120.* Second term, *Goldwin Smith 128.*

(a) Plautus (Mostellaria, Captivi); (b) Cicero, Philippics II; (c) Lucretius; (d) Virgil, Bucolics and Georgics.

[17. **Literature and History of the Early Empire.** Throughout the year. Credit three hours a term. Prerequisite Latin 8. Professor ELMER. Not given in 1926-27.]

21. **Latin Writing, Intermediate Course.** Throughout the year. Credit one hour a term. Prerequisite, Latin I or Ia. Professor ELMER. M 12. *Goldwin Smith 128.*

Recommended to sophomores.

26. **Teachers' Training Course.** Throughout the year. Credit two hours a term. First term, Professor ELMER. T Th 12, *Goldwin Smith 120.* Second term, Professor DURHAM, T Th 12, *Goldwin Smith 128.*

Open to students who have taken Course 8, or 11, or 12, and have taken or are taking Course 16 or 17.

[27. **Topography and Architectural Remains of Rome.** Second term. Credit two hours. Professor DURHAM. Not given in 1926-27.]

[30. **Lectures on Roman Literature: The Republican Period.** First term. Credit two hours. Professor DURHAM. Not given in 1926-27.]

[31. **Lectures on Roman Literature: The Silver Age of Latin Literature, (with a study of the social and historical background).** First term. Professor MOUNTFORD. Not given in 1926-27.]

[33. **Roman Oratory and Rhetoric.** Assistant Professor CAPLAN. Not given in 1926-27.]

[39. **Latin Seminary.** Throughout the year. Professor DURHAM. Not given in 1926-27.]

[40. **Latin Seminary.** Throughout the year. Professor ELMER. Not given in 1926-27.]

[41. **Latin Seminary.** Throughout the year. Professor MOUNTFORD. Not given in 1926-27.]

45. **Latin Writing, Advanced Course.** Throughout the year. Credit one hour a term. Professor ELMER. T 2. *Goldwin Smith 124.*

For graduates and undergraduates who have taken Latin 21.

48. **Vulgar Latin: Petronius, Cena Trimalchionis; Vulgar Latin Inscriptions, including Christian Inscriptions.** Second term. Credit two hours. Professor DURHAM. W F 12. *Goldwin Smith 128.*

Primarily for graduates.

[49. **Indo-European Philology; Sounds and Flexions of Latin; Italic Dialects.** Throughout the year. Credit two hours. Professor DURHAM. Not given in 1926-27.]

[50. **Latin Epigraphy.** Second term. Credit two hours. Professor DURHAM. Not given in 1926-27]

Roman History. Professor LAISTNER. See History, 1, 4, 5, and 6.

ECONOMICS

Course 1 or its equivalent—e. g. course 81 for mature or graduate students—must be completed before any credit may be obtained toward the upperclass requirement.

To satisfy the upperclass requirement in Economics a student must complete (1) Course 1 or its equivalent; (2) a minimum of five hours in each of three groups other than the introductory group; (3) twenty hours in economics, completed after attaining upperclass status.

A student who is excused from ten of the required twenty hours in an upperclass group must complete (1) course 1 or its equivalent; (2) a minimum of five hours in each of two groups, or of three hours in each of three groups other than the introductory group; (3) ten hours in economics completed after attaining upperclass status.

Certain courses in Agricultural Economics may be counted in partial fulfillment of the major requirement in Economics, but in no case may more than six of the twenty required hours be allowed for such courses; and, in each case, the specific approval of the adviser must be obtained before credit for such courses may be counted toward the upperclass requirement. Students must secure the approval of their adviser, and the permission of the Dean and of the instructor in charge of the course, before they may register for courses given outside of the College.

The attention of students intending to elect Economics as their upperclass group is directed to the following courses in Government, History, and Philosophy: History of Political Thought; English History, American History, Economic History of the United States, History of Modern Europe, The Intellectual History of Modern Times; Problems of Philosophy, History of Philosophy, Social and Political Ethics.

INTRODUCTORY COURSES

*1. **Modern Economic Society.** Repeated in second term. Credit five hours. Professor SLICHTER. Daily except S 8, 9, 10, 11, 12, 2.

A survey of the existing economic order, its more salient and basic characteristics, and its operation.

In the first term, the enrollment will be limited. Students should register, if possible, on the first day of registration. Assignment to sections will be made on registration days at Goldwin Smith 260.

*2a. **Modern Economic Society.** First term. Credit three hours. Professor SLICHTER. M W F 8, 9, 11; T Th S 8, 9, 11.

This course and course 2b cover the same subject matter as course 1.

Enrollment will be limited. Students should register, if possible, on the first day of registration. Assignment to sections will be made on registration days in Goldwin Smith 260.

*2b. **Modern Economic Society.** Second term. Credit three hours. Pre-requisite course 2a. Professor SLICHTER. M W F 8, 9, 11. T Th S, 8, 9, 11. Continuation of course 2a.

*3. **Introduction to Economics.** For students in Engineering and Chemistry. Repeated in second term. Credit three hours. Assistant Professor MAY. Hours to be announced.

An introduction to the more essential outlines of contemporary economic organization and to a number of economic problems about which a citizen in American Society is required to formulate or express opinions.

*5. **Current Economic Problems.** Second term. Credit three hours. Pre-requisite, Economics 1 or its equivalent. Assistant Professor MAY. Hours to be announced.

A continuation of Course 1 or 2 designed to afford students an opportunity to become acquainted in a general way with the more important economic problems of the day—tariff problems, reparations problems, railroad problems, trust prob-

lems, labor problems, problems of the farmer, conservation problems, and problems of taxation and public finance.

Assignment to sections will be made on registration days in *Goldwin Smith 269*.

FINANCE

11. Money and Banking. Repeated in second term. Credit five hours. Prerequisite, Economics I or its equivalent. Professor REED. First term, daily except S 10. *Goldwin Smith 142*. Second term, daily except S 11. *Goldwin Smith 142*.

A study of the history and the theory of money and banking.

Enrollment limited to seventy-five students.

12. Money, Credit, and Foreign Exchange. Second term. Credit three hours. Prerequisite Course 11. Consult the instructor before registering. Professor REED. T Th S 9. *Goldwin Smith 264*.

A critical discussion of some selected phases of monetary theory.

13. Corporation and Investment Finance. First term. Credit three hours. Prerequisite Economics 11 and 21a. Professor ENGLISH and Mr. O'LEARY. M W F 9. *Goldwin Smith 256*.

A study of the financial problems of the business corporation from the points of view of the management and of the investor.

15. Cyclical Analysis. First term. Credit three hours. Prerequisite, Economics 11. Professor REED. T Th S 9. *Goldwin Smith 264*.

Theoretical and historical interpretations of crises and depressions; their economic significance and methods of forecasting.

[19. **Research in Finance.** Throughout the year. Credit two or four hours. Open to graduate students and honor seniors. Consult the instructor. Professor REED. Not given in 1926-27.]

The attention of students is called to the following related work: Agricultural Statistics, Agricultural Prices, Corporation Law, Introduction to the Mathematics of Finance, Theory of Probability.

ACCOUNTING

21a. Accounting. Repeated in second term. Credit three hours. Prerequisite, Economics I or its equivalent. Professor ENGLISH, Mr. BEATTY, and Mr. HUDGINS. First term, M W F 8, *Goldwin Smith C*; second term, M W F 10, *Goldwin Smith C*. One practice period a week. *Goldwin Smith*.

Theory of debit and credit; the journal and ledger; the development of books of original entry; analysis of income sheets and balance sheets.

21b. Accounting. Repeated in second term. Credit three hours. Prerequisite, Economics 21a. Professor ENGLISH, Mr. BEATTY, and Mr. HUDGINS. First term, T Th S 8, *Goldwin Smith 256*; second term, M W F 8, *Goldwin Smith 256*. One practice period a week. *Goldwin Smith*.

The issue and transfer of capital stock; bonds and their valuation; depreciation; reserves and reserve funds; sinking funds; analysis of income sheets and balance sheets.

25. Cost Accounting. First term. Credit two hours. Prerequisite, Economics 21b. Professor ENGLISH. T Th 9. *Goldwin Smith 256*.

The purposes and methods of determining manufacturing costs.

26. Accounting Theory and Problems. Second term. Credit three hours. Prerequisite, Economics 21b, or its equivalent. Professor ENGLISH. M W F 9. *Goldwin Smith 256*.

A critical study of the fundamental principles underlying accounting procedure. The solution of typical problems in corporate consolidation, reorganization and liquidation, and in other special fields.

29. Special Problems in Accounting. Throughout the year. Credit one or two hours a term. Consult the instructor. Professor ENGLISH.

The theoretical study and the solution of selected problems.

The attention of students is called to the following related work: Introduction to the Mathematics of Finance, The Law of Contracts, Corporation Law, Partnership Law.

PUBLIC REGULATION OF INDUSTRY AND TRADE

31. **Transportation and Communication.** Second term. Credit three hours. Open to upperclassmen who have credit for Economics 21a. Assistant Professor COPELAND. M W F 10. *Goldwin Smith 245.*

Public policy in methods of organization and administration of basic industries. Topic for 1926-27, The Railroad Industry.

[35. **Trusts and Modern Capitalism.** Second term. Credit three hours. Prerequisite, Economics 31 or consent of the instructor. Assistant Professor COPELAND. M W F 10. *Goldwin Smith 245.* Not given in 1926-27.]

37. **Public Regulation of Competition.** Throughout the year. Credit three hours a term. Prerequisite course I or its equivalent. Consult the instructor before registering. Assistant Professor MAY. M W F 11. *Goldwin Smith 264.*

First term: An economic critique of the classification and regulation of public utilities and industries which have been held to be affected with a public interest.

Second term: An attempt to appraise the economic significance of trusts and modern business combinations and of the control which has been exercised over them under the anti-trust laws.

The attention of students is called to the following related work: American Government, Social and Political Ethics, Marketing, Law of Public Service and Carriers, Law of Restraints on Business and Industry.

LABOR AND INDUSTRIAL RELATIONS

43. **Trade Unionism in the United States.** First term. Credit three hours. Prerequisite course I or its equivalent. Professor SLICHTER. M W F 9. *Goldwin Smith 142.*

A study of the origins, development, philosophies, aims and policies of American trade unionism with special reference to the factors which have determined the character of the American labor movement and with emphasis on current problems of unionism and on present trends in union policies.

44. **The State in Relation to Labor.** Second term. Credit three hours. Consult the instructor before registering. Professor SLICHTER. M W F 9. *Goldwin Smith 142.*

An examination of the efforts of the State to assist in the solution of the labor problem. Conciliation, arbitration, industrial courts, the legal minimum wage, workmen's compensation, labor exchanges, social insurance, administrative machinery and problems.

47. **Industrial Government.** Second term. Credit three hours. Consult the instructor before registering. Professor SLICHTER. Hours to be arranged.

An intensive examination of problems arising from the participation of labor in the government of industry. Evolution of trade agreements and experience under representative trade agreements will be studied in some detail and an examination will be made of some of the more important untried proposals.

49. **Research in Industrial Relations.** Throughout the year. Credit two hours a term. Consult the instructor before registering. Professor SLICHTER. Hours to be arranged.

Discussions and individual investigations of current and theoretical problems in the field of industrial relations.

The attention of students is called to the following related work: Elementary Social Science, Constitutional History of the United States, The American Federal System, Fundamental Rights and Immunities, Social and Political Ethics, Constitutional Law, Law of Restraints on Business and Industry.

SOCIAL SCIENCE

[55a. **Elementary Social Science.** First term. Credit three hours. Professor WILLCOX. M W F 9. *Goldwin Smith A.* Not given in 1926-27.]

[55b. **Elementary Social Science.** Second term. Credit three hours. Economics I or its equivalent should accompany or precede this course. Open by special permission to students who have not taken course 55a. Professor WILLCOX. M W F 9. *Goldwin Smith A.* Not given in 1926-27.]

[56b. **Social Theory.** Second term. Credit two hours. Prerequisite, Economics 55a or related courses in Philosophy or History and a grade of work satisfactory to the instructor. Admission on personal or written application. Professor WILLCOX. Th 4-6, or a day and hour to be arranged at the first meeting. *Goldwin Smith* 259. Not given in 1926-27.]

57a. **Human Nature and Social Institutions.** Open to graduates and qualified seniors. First term. Credit two hours. Consult the instructor before registering. Assistant Professor COPELAND. Hours to be arranged.

Theories of social psychology and of the relations between individual human nature and our present social and economic system.

57b. **Social Evolution.** Second term. Credit two hours. Open to graduates and qualified seniors. Consult the instructor before registering. Assistant Professor COPELAND. Hours to be arranged.

Theories of the evolution of human institutions and their bearing on the genesis of our present social and economic system.

STATISTICS

[76a. **Elementary Statistics.** First term. Credit three hours. Open only to those who have taken Economics 55b or are majoring in Economics. Professor WILLCOX. Not given in 1926-27.]

[76b. **Economic Statistics.** Second term. Credit three hours. Prerequisite, Economics 76a. Students majoring in Economics who have not had course 76a or its equivalent may be admitted by special permission. Professor WILLCOX. Not given in 1926-27.]

77. **Introduction to Statistical Methods.** First term. Credit three hours. Prerequisite, Economics I or its equivalent. Assistant Professor COPELAND. T Th II. *Goldwin Smith* 256. Laboratory, Th 2-4.

Intended to provide the students with an understanding of methods of analyzing and summarizing numerical data commonly employed in economic investigation.

[79. **Statistics of International Migrations.** First term. Credit two hours. Prerequisite, Economics 76a or its equivalent and a reading knowledge of a modern foreign language. Professor WILLCOX. Not given in 1926-27.]

ECONOMIC THEORY

81. **Principles of Economics.** First term. Credit five hours. Consult the instructor. Professor DAVENPORT. Daily except S 10. *Goldwin Smith* 264.

Intermediate theory, primarily for students majoring in economics who have had, preferably, one to two years of work in advance of course I; or for graduate students; or for the more mature students desiring an introductory course more searching and difficult than course I.

82. **Public Revenues.** Second term. Credit five hours. Primarily for advanced students. Professor DAVENPORT. Daily except S 10. *Goldwin Smith* 264.

The limits of state activity; justice in taxation; proportion vs. progression; problems of incidence; administrative aspects of income taxation; franchise and corporate taxation; the articulation of the various taxes.

[84. **The Price System.** Second term. Credit two hours. Assistant Professor COPELAND. Not given in 1926-27.]

89. **Value and Distribution.** Throughout the year. Credit six hours on completion of the course. Primarily for graduates. Professor DAVENPORT. Hours to be arranged.

The chief problems of current economic theory. The leading economic writers will be critically studied with a view to disclosing the basis of existing divergences.

The attention of students is called to the following related work: Political Philosophy and Science, Social and Political Ethics, Ethics of Modern Utilitarianism, General Psychology, Constitutional Law, The Law of Taxation.

INFORMAL STUDY AND HONORS IN ECONOMICS

The direction of informal study in economics, and the assistance of candidates for the degree with honors in economics is in charge of Assistant Professor COPE-

LAND. Qualified seniors may register for informal study for which from one to three hours credit each term will be granted, but such registration must have the approval of Professor COPELAND and the student's upperclass adviser.

EDUCATION

Psychology 1, 1a, or 1b, is prerequisite to all courses in Education.

1. **Educational Psychology.** Repeated in second term. Credit three hours. Lectures and recitations. First term. Professor OGDEN and Mr. GILBERT. M W F 11. Second term, Mr. FREEMAN and Mr. GILBERT. M W F 10. *Goldwin Smith 142.*

A study of functional psychology with special reference to the learning process and its application to educational theory and practice.

2. **Principles of Secondary Education.** Second term. Credit three hours. Prerequisite, Education 1. Section I, M W F 2. Professor JORDAN. *Goldwin Smith 234.* Section II, T Th S 12. Mr. FREEMAN. *Goldwin Smith 234.*

The nature and significance of education; biological and psychological foundations; the secondary school as a social institution; educational ideas and values; the curriculum; administration and general methods. Students who elect Course 2 must apply at *Goldwin Smith 248* for assignment to sections.

3. **History of Education.** First term. Credit three hours. Prerequisite, Education 1. Section A, T Th S 10, Assistant Professor SMITH. Section B, T Th S 12, Mr. GILBERT. *Goldwin Smith 234.*

A general historical account of the development of educational aims, contents, and methods in relation to ethnological, psychological, and sociological factors. Students who elect Course 3 must apply at *Goldwin Smith 248* for assignment to sections.

4. **Method and Procedure in High School Teaching.** First term. Credit three hours. For seniors only. Professor JORDAN. M W F 11; M W F 3. *Goldwin Smith 256.*

Designed for students who expect to teach in secondary schools. The relation and duties of high school teachers to their students, to the community, and to the state; methods of class management and types of recitation. Observation of actual high school classes required.

4a. **Observation and Practice in High School Method.** First term. Credit one hour. For seniors only. Professor JORDAN and Mr. ————. M 4. *Goldwin Smith 256.*

Planned to be taken coincidentally with course 4, and required of students desiring to meet the New York State requirements for the provisional professional certificate.

5. **Philosophy of Education.** Second term. Credit two hours. Prerequisite, Education 1 and at least one course in Philosophy. Professor OGDEN. W 2-4. *Goldwin Smith 248.*

A study of education as interpreted by the more important philosophical conceptions and theories, with special application to the spirit and demands of modern society.

6. **Experimental Education.** Second term. Credit two hours. Prerequisite, Education 1 and Psychology 3. Mr. FREEMAN. T Th 2-4:30. *Goldwin Smith 248.*

The chief problems of experimental education; the application of psychological and statistical methods to problems in educational psychology; chief results and practical bearings.

7. **Mental and Educational Measurements.** First term. Credit three hours. Prerequisite, Education 1 and permission of the instructor. Mr. FREEMAN. T Th 9. *Goldwin Smith 236.* Laboratory hours to be arranged.

The nature of intelligence. The history of the development of individual and group tests of intelligence; principles underlying their formation and application; the use of tests of intelligence in dealing with defective and superior children, and with problem cases; their use in general school problems. The theory, construction, and use of educational tests. Experience in administering tests.

8. **Experimental Investigation.** Repeated in second term. Credit and hours

to be arranged. Prerequisite, Education 6 or 7. Professor OGDEN and Mr. FREEMAN. Day and hour to be arranged. *Goldwin Smith 251.*

Experimental study of a special problem in educational psychology or in mental measurements.

9. **Reading of German Educational Psychology.** First term. Credit two hours. Prerequisite, Education I. Professor OGDEN. W 4-6. *Goldwin Smith 248.*

The aim of the course is to aid in facility of translation and to familiarize the student with certain monographic literature.

[10. **City School Administration and Supervision.** Throughout the year. Credit two hours a term. Prerequisite, Education I. Professor JORDAN. M W 9. *Goldwin Smith 248.*

Principles of administration and supervision of state and city school systems, involving problems of evaluation and improvement of teaching, and of the subject matter in the public schools. The course will be adapted to the particular needs of the class. Not given in 1926-27.]

12. **The Junior High School.** Throughout the year. Credit two hours. For seniors, graduates, and other qualified students. Professor JORDAN. W 4-6. *Goldwin Smith 234.*

Psychological, biological, and pedagogical bases for the Junior High School; fundamental principles; organization and administration; curricular content in detail; methods of instruction.

16. **Readings in the History of Education.** Second term. Credit three hours. Prerequisite, Education I and 3, or by permission of the instructor. Assistant Professor ———. T Th S 9. *Goldwin Smith 248.*

17. **Mental Development.** First term. Credit two hours. Prerequisite, Education I. Professor OGDEN. T 2-4. *Goldwin Smith 248.*

A course in child psychology, dealing with the facts of mental growth and their interpretation.

20. **Seminary in Education.** First term. Credit two hours. Prerequisite, Education I. Professor OGDEN. M 4-6. *Goldwin Smith 248.*

Topics relevant to the fundamental assumptions of educational theory will be chosen. Primarily for graduate students.

21. **Seminary in Education.** Second term. Credit two hours. Admission by permission of the instructor. Professor JORDAN. M 4-6. *Goldwin Smith 248.*

Topics developing from historical and current problems of educational practice, especially as related to administration and conduct of the public school system and of the university. Primarily for graduate students.

The attention of students is called to the announcement of the Division of Education.

ENGLISH

*1. **Elementary Composition and Literature.** Throughout the year. Credit three hours a term. Messrs. BALDWIN, CARROLL, GREENE, JOHNSON, P. F. JONES, LINDSAY, and WILDER. M W F 8, 9, 10, 11, 12; T Th S 8, 9, 12. Rooms to be announced.

This course is designed for underclassmen in Agriculture, Architecture, and Chemistry who have satisfied the entrance requirements in English. A study of composition in connection with the reading of representative works in English literature. Students who have not taken the course in the first term may enter in the second term in sections provided for them.

Registration in the course is in charge of Mr. Baldwin. Students who elect English I must apply at *Roberts 292* on Wednesday, Thursday, Friday, or Saturday of registration week for assignment to sections.

*2. **Composition and Literature.** Throughout the year. Credit two hours a term. Assistant Professor FISKE and Messrs. VAN ALLEN, FRENCH, and LINDSAY. Hours and rooms to be arranged.

Reading of masterpieces, and practice in composition, with conferences. Open only to students in the College of Engineering. Registration is in charge of the College of Engineering.

*3. **Introductory Course.** Throughout the year. Credit three hours a term. Assistant Professor SMITH, Messrs. FRENCH, W. P. JONES, KESSEL, LINDSAY, MARX, MITCHELL, and VAN ALLEN. M W F 8, 9, 10, 11, 12; T Th S, 8, 9, 10, 11. Rooms to be announced.

Chaucer, Shakespeare, Milton, Pope, Goldsmith, Scott, Browning; practice in composition, with conferences. Open only to underclassmen who are candidates for the degree of Bachelor of Arts. Registration in charge of Professor Smith. Students who elect English 3 must apply at *Goldwin Smith A* on Wednesday, Thursday, Friday, or Saturday of registration week for assignment to sections.

*3a. **Introductory Course.** Throughout the year. Credit one hour a term. Open only to freshmen enrolled in English 1 or 3. Professor SAMPSON. S 12. *Goldwin Smith A*.

Lectures on English poetry with assigned readings.

5. **Short Story Writing.** Throughout the year. Credit three hours a term. Open to upperclassmen after consultation with the instructor. Assistant Professor SMITH. T Th S 10. *Goldwin Smith 160*.

8. **English Usage and Style.** Throughout the year. Credit three hours a term. Prerequisite, completion of English 20 or 22 with good standing. First term, Assistant Professor FISKE; second term, Professor STRUNK. T Th S 9. *Goldwin Smith 160*.

The first term is devoted chiefly to composition. The second term includes, along with composition, the study of the theory of good English; the study of words, idioms, and pronunciation and related topics.

*20. **Nineteenth Century Prose.** Throughout the year. Credit three hours a term. Prerequisite, English 1 or 3. Assistant Professor MONROE, M W F 11, T Th S 10, *Goldwin Smith 164*; Assistant Professor BROUGHTON, M W F 10, *Goldwin Smith 160*; Assistant Professor HEBEL, T Th S 9, 12, *Goldwin Smith 164*; Assistant Professor FISKE, M W F 9, *Goldwin Smith 164*; instructor to be announced, M W F 12, *Goldwin Smith 164*.

Reading of nineteenth century prose; practice in composition.

*22. **Nineteenth Century Poetry.** Throughout the year. Credit three hours a term. Prerequisite, English 1 or 3. Professor SAMPSON. Conferences with Mr. KESSEL, M W F 11. *Goldwin Smith A*.

Wordsworth, Coleridge, Byron, Shelley, and Keats.

32b. **History of English Literature.** Throughout the year. [Not given in first term, 1926-27.] Credit three hours a term. Prerequisite, two years of English. Professor STRUNK. T Th S 10. *Goldwin Smith 156*.

Lectures on English literature, from the fourteenth century to the present, with reading and reports.

[34. **Chaucer.** Throughout the year. Credit three hours a term. Open to upperclassmen. Professor STRUNK. Not given in 1926-27.]

35. **Biography.** Second term. Credit two hours. Open to upperclassmen. Assistant Professor SMITH. T Th 2. *Goldwin Smith 134*.

Boswell's Johnson, Gibbon, Borrow.

37b. **Shakespeare.** Second term only. Credit three hours. Prerequisite, two years of English. Professor STRUNK. M W F 10. *Goldwin Smith 156*.

A detailed study of selected tragedies.

38. **Eighteenth Century Poetry.** Throughout the year. Credit two hours a term. Open to upperclassmen. Assistant Professor MONROE. T Th 12. *Goldwin Smith 156*.

English poets of the Restoration and the eighteenth century: Dryden, Pope, Thomson, Gray, Collins, Goldsmith, Cowper, and Burns; the lesser English and Scotch poets; beginnings of the English Romantic movement.

39. **Eighteenth Century Prose.** Throughout the year. Credit three hours. Open to upperclassmen and graduates. Assistant Professor BROUGHTON. T Th S 9. *Goldwin Smith 142*.

A study of the leading prose writers of the century: Defoe, Swift, Addison, Steele, Goldsmith, Johnson, Burke, the early novelists, and others.

40. **Methods and Materials in Elizabethan Research.** Throughout the year. Open only to graduates. Professor ADAMS. Day and hour to be arranged. *English Seminary*.

41. **The English Drama to 1642.** Throughout the year. Credit three hours a term. Prerequisite, twenty-four hours of University credit with a grade of A or B. Professor ADAMS. M W F 11. *Goldwin Smith B.*

First term: the origin of the drama; miracles, moralities; interludes; the first regular comedies. Second term: the contemporaries and successors of Shakespeare.

42. **English Literature, 1500-1640.** Throughout the year. Open to graduates only. Professor ADAMS. Day and hour to be arranged. *Goldwin Smith 338.*

44. **Shakespeare.** First term. Credit three hours. Prerequisite, twenty-four hours of University credit with a grade of A or B. Professor ADAMS. M W F 12. *Goldwin Smith B.*

Shakespeare's dramatic technique studied in his chief plays.

45. **Modern Novelists.** Throughout the year. Credit two hours a term. Open only to upperclassmen who have passed twelve hours of English with a grade of A or B. Professor SAMPSON. T Th 12. *Goldwin Smith 142.*

A study of representative works of recent novelists: Hardy, Meredith, James, Conrad, and others.

46. **Byron and Shelley.** First term. Credit two hours. Prerequisite, English 22. Professor PRESCOTT. T Th 2. *Goldwin Smith 162.*

In 1926-27: A study of Byron's life, his principal works, and his influence.

47. **English Poetry.** First term. Credit three hours. Open to upperclassmen. Professor PRESCOTT. M W F 10. *Goldwin Smith 162.*

A general course in the nature of poetry and of poetic forms with reading of illustrative poems.

48a. **American Literature.** First term. Credit three hours. Open to seniors and graduates. Professor PRESCOTT. M W F 12. *Goldwin Smith 156.*

American literature of the Colonial and Revolutionary periods; the growth of literary independence; Irving, Bryant, and Cooper.

48b. **American Literature.** Second term. Credit three hours. Prerequisite, English 48a. Open to seniors and graduates. Assistant Professor BROUGHTON. M W F 12. *Goldwin Smith 156.*

American prose and poetry of the nineteenth century.

49. **Pastoral Poetry.** Throughout the year. Credit two hours. Open to upperclassmen and graduates. Assistant Professor BROUGHTON. F 4-6. *Goldwin Smith 160.*

A study of the sources and development of the appreciation of rustic life and landscape in poetry from Theocritus to recent writers.

50. **Seventeenth Century Literature.** Throughout the year. Credit three hours a term. Open to upperclassmen. The instructor's permission must be obtained for admission to the second term. Assistant Professor HEBEL. T Th S 11. *Goldwin Smith 134.*

First term: a study of English literature, history, and philosophy of the seventeenth century; Bacon, Donne, Herbert, Vaughan, Herrick, Burton, Browne, Walton, Hobbes, Clarendon, Pepys. Second term: Milton.

51. **Seventeenth Century Poetry.** Second term. Credit two hours. Open to seniors and graduates after consultation with the instructor. Assistant Professor HEBEL. Day and hour to be arranged.

52. **Victorian Literature.** Throughout the year. Credit three hours a term. Open to upperclassmen and graduates. Professor NORTHUP. T Th S 9. *Goldwin Smith 156.*

Lectures on the chief characteristics and literary tendencies of the period; studies of the leading poets and the greater writers of prose, including fiction.

53. **Old English.** Throughout the year. Credit three hours a term. Open to upperclassmen. Assistant Professor MONROE. M W F 9. *Goldwin Smith 162.*

Old English grammar. Reading of selections from the Old English Chronicle, King Alfred, Aelfric, and other representative prose texts, and of the simpler poetry. A part of the second term is devoted to early Middle English, with supplementary reading on the growth of the language.

This course is recommended by the Department to those intending to teach English. The course should be taken in the junior year.

54. **Old English Literature.** Second term. Credit two hours. Open to graduates and qualified seniors. Assistant Professor MONROE. T Th 3, or other hours to be arranged. *Goldwin Smith 162.*

Reading of selected Old English works including Beowulf or some of the Cynewulfian poetry; studies in textual criticism and in style and metre; supplementary reading.

[55. **Middle English Literature.** Throughout the year. Credit three hours a term. Open to upperclassmen and graduates. Professor NORTHUP. Not given in 1926-27.]

[56. **History of the English Language.** Second term. Credit two hours. Open to upperclassmen and graduates. Assistant Professor MONROE. Not given in 1926-27.]

The development of the English language, with consideration of language in general, including elementary phonetics. Recitations, lectures, collateral reading. The course does not require previous knowledge of Old and Middle English.

59. **Dramatic Structure.** Throughout the year. Credit three hours a term. Open to seniors and graduate students. Professor SAMPSON. T Th S 11. *Goldwin Smith 156.*

A study of the principles of dramatic construction based upon Greek, Elizabethan, and classical French drama (first term), and modern drama (second term).

69. **Teachers' Course.** Second term. Credit two hours. Open to seniors and graduates. Professor NORTHUP. T Th 12. *Goldwin Smith 227.*

Lectures, readings, and conferences on the teaching of English in the secondary schools.

71. **English Translations of Greek and Latin Classics.** Throughout the year. Credit three hours a term. Open to sophomores and upperclassmen. Professor COOPER. T 3; Th 3-5. *Goldwin Smith 236.*

Rapid reading in the best translations, with emphasis upon Greek masterpieces; for example, the Iliad and the Odyssey, the tragedies of Sophocles, and several dialogues of Plato. Translations from the Latin will be chosen for the bearing of the original works upon modern literature.

72. **Principles of Literary Criticism.** Throughout the year. Credit three hours a term. Primarily for graduates, open to upperclassmen by permission. Professor COOPER. W 3-5, and another hour to be arranged. *Goldwin Smith 236.*

A study of the chief theories of poetry, and chief kinds of literature, with illustrations drawn from writers both ancient and modern.

[73. **Dante in English.** Throughout the year. Credit three hours a term. Primarily for graduates, open to upperclassmen by permission. Professor COOPER. Not given in 1926-27.]

74. **Old and Middle English.** Throughout the year. Credit three hours a term. Open to sophomores and upperclassmen, and to graduates by special permission. Professor COOPER. M W F 10. *Goldwin Smith 164.*

A study of the foundations of the English language and literature, with emphasis upon literary aspects so far as a proper acquisition of linguistic knowledge shall permit. The work of the second term deals partly with Chaucer. Students may be admitted at the beginning of either term after consultation with the instructor.

This course is recommended by the Department to those intending to teach English.

75. **Methods of Literary and Linguistic Study.** Throughout the year. Credit three hours a term. Open to graduates. Professor COOPER. M 3-5:30. *Goldwin Smith 236.*

Reading in the Encyklopädie of August Boeckh, followed by a study of more recent treatises with special reference to the ancient classics and English.

76. **Chaucer Seminary.** Throughout the year. For graduates only. Professor COOPER. Wednesday 7:30 p. m. *English Seminary.*

A survey of books and topics that are essential to the study of Chaucer and his age; systematic reading of his works; a detailed examination of significant problems.

80. **Wordsworth and His Contemporaries.** Throughout the year. Credit

three hours. Open to upperclassmen and graduates. Assistant Professor BROUGHTON. M W F 9. *Goldwin Smith* 156.

A detailed study of the works of Wordsworth and their influence on contemporary English thought and literature.

86. **Nineteenth Century Fiction.** Throughout the year. Credit two hours a term. Open to graduates. Professor NORTHUP. Th 4-6. *Goldwin Smith* 338.

A seminary course; studies in the development of the novel from Scott to Meredith.

89. **Elizabethan Drama.** Throughout the year. Open to graduates only. Middleton, and Beaumont and Fletcher. Professor SAMPSON.

GEOLOGY

100. **Introductory Geology.** Repeated in the second term. Credit three hours. Professor RIES, Miss ST. JOHN, Mr. TRAINER, and Mr. GWYNNE. Lectures first term, T Th 11; second term T Th 9. *Sibley Dome*. Laboratory, M T W Th F afternoons or S morning. *McGraw*.

Students must register for laboratory assignment at *Geology Laboratory, McGraw*, before the beginning of the course. The fundamental principles of this branch of science. The inorganic aspects of the subject are emphasized more than the organic.

400. **Introductory Historic Geology.** Second term. Credit three hours. Prerequisite, Geology 100 or its equivalent; a course in vertebrate zoology is also desirable. This course would normally follow Course 100, but students who have had two terms of course 200, and Zoology 1, may also take it.

Professor HARRIS. Lectures, T Th 10. Laboratory to be arranged. *McGraw*.

An elementary review of the geologic history of the earth and its inhabitants, with special emphasis on American Geology. Field trips in laboratory periods.

Courses 101, 102, 200, 201, 311 and 500 (first term) may also be taken following 100.

DYNAMIC AND STRUCTURAL GEOLOGY

*101. **Major Problems in Geology.** Second term. Credit three hours. Prerequisite, Geology 100 or 501. Assistant Professor NEVIN. Lectures, T Th 11, F 2. *McGraw*.

A study of some of the interesting problems of Geology.

102. **Structural Geology.** First term. Credit three hours. Prerequisite, Geology 100 or the equivalent. Assistant Professor NEVIN. Lectures T Th 11. Laboratory, T 2. *McGraw*.

A study of geologic structures and their causes with illustrations. Opportunity for field trips will be given, and they are strongly recommended. Those taking course 502 are advised to take this course first if possible.

103. **Sedimentation.** First term. Credit three hours. Prerequisite, Geology 100. Assistant Professor NEVIN. Lectures, T Th 9. Laboratory, Th 2. *McGraw*.

Part of the laboratory periods will be spent in the field. This course is devoted to a study of the principles involved in the formation of sediments.

104. **Geologic Model Making.** Second term. Credit variable. Prerequisite, Geology 100. Assistant Professor NEVIN. Day and hour to be arranged. *McGraw*.

Intended chiefly for students who are majoring in Geology.

105. **Metamorphic Geology.** Second term. Credit two hours. For advanced students. Assistant Professor NEVIN. M W 9. *McGraw*.

The processes and criteria of rock metamorphism.

106. **Special work in Structural Geology.** Throughout the year. Credit variable. Prerequisites variable. Assistant Professor NEVIN. Hours to be arranged. *McGraw*.

For advanced students and graduates. Original investigation adapted to the needs of the student.

PHYSICAL GEOGRAPHY

*200. **Elementary Physical Geography.** Throughout the year. Credit three hours a term; if taken after Geology 201, credit two hours a term. Professor VON ENGELN and Mr. FRIDLEY. Lectures, M W 9. *McGraw, Geology Lecture Room*.

Laboratory, W or Th 2-4:30. Students must register for laboratory assignments at the *Physical Geography Laboratory* on registration day.

High school courses are not the equivalent of this course and will not be so considered as a prerequisite for advanced courses. All students are required to go on one all-day excursion to Taughannock Gorge and Falls.

*201. **Physiography of the Lands and Oceanography.** Second term. Credit three hours. Open only to freshmen and sophomore students who have had Geology 100. Professor VON ENGELN and Mr. FRIDLEY. Lectures, M W F 11. *McGraw, Geology Lecture Room.*

The systematic and cyclic development of land forms under humid, arid, and glacial conditions, and the interpretation of such forms; oceanic phenomena and processes. Intended for students who desire a scientific appreciation of the inorganic elements of the landscape.

203. **Geography of North America.** First term. Credit two hours. Students should consult instructor before registering. Professor VON ENGELN. Lectures, T Th 10. *McGraw, Geology Lecture Room.*

The physiographic features of North America; discussion of their influence upon the settlement and development of the various sections.

205. **Glaciers and Glaciation.** Second term. Credit three hours. Prerequisite Geology 200 or, with permission, Geology 100. Professor VON ENGELN and Mr. FRIDLEY. Lectures, T Th 11. *McGraw.* Laboratory, T 2-4:30. *McGraw.*

Living glaciers and the phenomena of the glacial period. Field excursions during the laboratory period in the spring; longer excursions on Saturday. Mapping and interpretation of glacial deposits.

206. **Commercial Geography.** First term. Credit two hours. Prerequisite, Geology 200 or Economics 1. Professor VON ENGELN. Lectures, T Th 11. *McGraw, Geology Lecture Room.* Lectures, reading, and term report.

The geographic factors affecting production and distribution of commodities. Discussion of the geographic origins and nature of commercial exchange of goods, routes of commerce, localization of industry, modern city sites, utilization of tropical lands, etc.

208. **Advanced Physiography, Experimental and Research Work.** Throughout the year. Credit variable. Registration by permission. Professor VON ENGELN. Day and hour to be arranged. *McGraw.*

Original investigation by each student; reading, conferences, excursions, and presentation of reports of progress. In general, graduate students registering for a minor in physical geography will be expected to take up some problem in this course.

209. **Seminary.** First term. Credit two hours. For upperclassmen and graduate students with requisite preparation. Registration by permission. Professor VON ENGELN. Day and hour to be arranged. *McGraw, Physical Geography Laboratory.*

Preparation and reading of reports upon special topics; abstracts and discussions of current geographic literature.

Meteorology and Climatology. (See Announcement of the College of Agriculture.)

MINERALOGY AND PETROGRAPHY

*311. **Elementary Mineralogy.** Repeated in second term. Credit three hours; if taken after Geology 312, two hours. Prerequisite, Chemistry 101. Professor GILL, Mr. MARTENS, and Mr. STOW. Lectures, M W 8. Laboratory, to be arranged. *Geology Lecture Room, McGraw.*

For beginners who desire a general knowledge of the commonest minerals, their uses, the properties by which they are recognized, and their significance as constituents of the earth's crust, or as sources of useful substances. The course consists of two parts, crystallography and mineralogy proper, in each of which a passing grade must be attained in order to receive credit for the course.

312. **Crystallography.** First term. Credit three hours; if taken after Geology 311, two hours. Prerequisite, Chemistry 205 or 210, and Physics 3. Professor GILL. Lectures, T Th 8. Laboratory to be arranged. *Geology Lecture Room, McGraw.*

313. **Mineralogy.** Second term. Credit three hours; if taken after Geology 311, credit two hours. Prerequisite, Geology 312. Professor GILL. Lectures, T Th 8. Laboratory to be arranged. *Mineralogy Laboratory, McGraw.*

For students wishing to become acquainted with the commoner minerals and with the scientific and practical problems which they present.

314. **Blowpipe Determination of Minerals.** First term. Credit one hour. Prerequisite, Geology 311 or 313, and Chemistry 205 or 210. Professor GILL and Mr. MARTENS. Saturday morning. *Blowpipe Laboratory, McGraw.*

315. **General Lithology.** Second term. Credit one hour. Prerequisite, Geology 100 and 311. Professor GILL. Lectures, laboratory, and recitations, S 8-10. *Mineralogy Laboratory, McGraw.*

An elementary course designed to teach recognition of the various kinds of rocks, their mineral composition, and mode of origin.

316. **Crystal Measurement and Drawing.** Second term. Credit two hours. Prerequisite, Geology 312. Professor GILL. Day and hour to be arranged. *Mineralogy Laboratory, McGraw.*

Laboratory measurement of crystals, with computation and drawing. Course 316 should be taken after course 312 by students who intend to continue in course 317, or in course 320.

317. **Optical Determination of Minerals.** First term. Credit three hours. Prerequisite, Geology 313. Professor GILL and Mr. MARTENS. Lectures, M W. Laboratory, to be arranged. *Petrography Laboratory, McGraw.*

318. **Petrography.** Second term. Credit three hours. Prerequisite, Geology 317. Professor GILL and Mr. MARTENS. Lectures, M W. Laboratory, to be arranged. *Petrography Laboratory, McGraw.*

319. **Sedimentary Petrography.** Second term. Credit three hours. Prerequisite, Geology 317. Mr. MARTENS. Hours to be arranged. *McGraw.*

The methods of investigating the mineral composition, texture, and other physical characteristics of sedimentary rocks; some of the applications of these methods to geological problems.

320. **Advanced or Special Work in Mineralogy, Crystallography, or Petrography.** Throughout the year. Credit variable. Prerequisite, variable. Professor GILL and Mr. MARTENS. Day and hour to be arranged. *McGraw.*

Adapted to the needs of the individual student.

321. **Seminary in Mineralogy and Crystallography.** Throughout the year. Credit one hour a term. Prerequisite, Geology 312, 313, and 317. Professor GILL. M 4:45. *Mineralogy Laboratory, McGraw.*

PALEONTOLOGY AND STRATIGRAPHIC GEOLOGY

*400. **Historic Geology.** Second term. Credit three hours. Prerequisite, Geology 100 or the equivalent; a course in vertebrate zoology is also desirable. Professor HARRIS. Lectures, T Th 10. Laboratory, to be arranged. *McGraw.*

An elementary review of the geologic history of the earth and its inhabitants, with special emphasis on American geology; the second half of the course in elementary geology. Field trips in laboratory periods.

401. **General Stratigraphic Geology.** Throughout the year. Credit two hours a term. Prerequisite, Geology 100, 400, 403, and reading knowledge of French and German. Professor HARRIS. Day and hour to be arranged. *McGraw, 28.*

402. **Geological Surveying.** First term. Credit one hour. Prerequisite, Geology 100 and 400, or the equivalent, and Plane Trigonometry. Professor HARRIS. Day and hour to be arranged. *McGraw 28.*

403. **Invertebrate Paleontology.** Throughout the year. Credit two hours a term. Prerequisite, Invertebrate Zoology or Biology. Pelecypoda and Gastro-poda. Professor HARRIS. Day and hour to be arranged. *McGraw 28.*

404. **Paleontologic Problems.** Throughout the year. Credit variable. Prerequisite, Geology 400 and 403. Professor HARRIS. Day and hour to be arranged. *McGraw 28.*

405. **Invertebrate Paleontology.** Throughout the year. Credit two hours a

term. Prerequisite, Invertebrate Zoology or Biology. Brachyopoda and Cephalopoda. Professor HARRIS. Day and hour to be arranged. *McGraw 28.*

406. **Invertebrate Paleontology.** Throughout the year. Credit two hours a term. Prerequisite, Invertebrate Zoology or Biology. Microscopic organisms. Professor HARRIS. Day and hour to be arranged. *McGraw 28.*

ECONOMIC GEOLOGY

500. **General Economic Geology.** Throughout the year. Credit three hours a term. Prerequisite, first term, Geology 100; second term, 100 and 311. Professor RIES and Mr. LANGFORD. Lectures, M W 10. Laboratory, F 2. *McGraw.*

The origin, nature, distribution, uses and economic value of mineral products. First term, non-metallics, including coal, oil, gas, fertilizers, etc.; second term, the ore deposits of the different metals.

*501. **Engineering Geology.** Repeated in second term. Credit four hours. For engineering students. Professor RIES and Mr. LANGFORD. Lectures, M W 11. Two laboratory periods, M W or T Th 2. *McGraw.*

A discussion of the practical application of geologic principles to engineering work, and of the occurrence of such economic materials as are of importance to engineering students.

502. **Petroleum Geology.** Second term. Credit three hours. Prerequisite, Geology 100. Assistant Professor NEVIN. Lectures, T Th 9. Laboratory or field work, T 2. *McGraw.*

A course on the geology, geologic field methods, distribution, and methods of obtaining petroleum.

510. **Clay Investigation.** Second term. Credit three hours. Prerequisite, Geology 100 or 501, and Chemistry 101, and permission of the instructor. Professor RIES and Mr. TRAINER. One lecture and two laboratory periods to be arranged. *McGraw.*

511. **Advanced or Special Work in Economic Geology.** Throughout the year. Credit three hours. Prerequisite, dependent on the nature of the work. Professor RIES. Day and hour to be arranged. *McGraw.*

512. **Seminary in Economic Geology.** Throughout the year. Credit two hours a term. Prerequisite, Geology 100 and 500. Professor RIES. Day and hour to be arranged. *McGraw.*

Open only to graduates.

GERMAN

*1. **Course for Beginners: Oral Training, Grammar, Composition, Translation.** Repeated in second term. Credit six hours.

First term:

Sec. 1, daily 8. *Goldwin Smith 183.* Dr. FLEISSNER.

Sec. 2, daily 10. *Goldwin Smith 183.* Professor POPE.

Second term:

Sec. 1, daily 8. *Goldwin Smith 183.* Dr. FLEISSNER.

Sec. 2, daily 9. *Goldwin Smith 183.* Assistant Professor ANDREWS.

This course is equivalent to first and second year German of the entrance requirements (credit two units). It may be elected for three hours' credit by students who have entrance credit for only one unit of German (first year German).

*1a. **Course for Beginners: Oral Training, Grammar, Composition, Translation.** Throughout the year. Credit six hours on completion of the course.

Sec. 1, M W F 9. *Goldwin Smith 177.* Dr. FLEISSNER.

Sec. 2, M W F 11. *Goldwin Smith 183.* Professor BOESCHE.

Sec. 3, M W F 11. *Goldwin Smith 177.* Dr. FLEISSNER.

Sec. 4, M W F 12. *Goldwin Smith 190.* Assistant Professor ANDREWS.

This course is continuous throughout the year, and no credit is allowed for the first term alone. It is equivalent to first and second year German of the entrance requirements (credit two units). It may be elected in the second term by students who have had first year German (one unit).

*3. **Oral Training, Grammar, Composition, Translation.** Repeated in second term. Credit five hours. Prerequisite, German 1, or entrance credit for two units of German (first and second year German).

First term:

M T W Th F 10. *Goldwin Smith* 190. Professor FAUST.

Second term:

M T W Th F 10. *Goldwin Smith* 190. Professor FAUST.

This course is equivalent to third year German of the entrance requirements.

*3a. **Oral Training, Grammar, Composition, Translation.** Throughout the year. Credit three hours a term. Prerequisite, German I, or entrance credit for two units of German (first and second year German). Dr. FLEISSNER. T Th S 12. *Goldwin Smith* 183.

This course is equivalent to third year German of the entrance requirements.

*4. **Elementary German Composition and Conversation.** Throughout the year. Credit three hours a term. Open to those who are taking or have taken German 3. Professor POPE. M W F 12. *Goldwin Smith* 183.

Exercises conducted in German. Course 4 may be combined with courses 3 or 5.

*5. **Intermediate German Course.** Throughout the year. Credit three hours a term. Prerequisite, German 3, or its equivalent. First term, Professor FAUST; second term, Professor POPE. M W F 11. *Goldwin Smith* 190.

Reading of modern German texts; oral exercises in German on the text; German grammar treated topically.

*8. **Scientific German.** Second term. Credit three hours. Prerequisite, German 1-3, or three years of German in High School. Assistant Professor ANDREWS. M W F 10. *Goldwin Smith* 183.

10. **Advanced German Composition and Conversation.** Throughout the year. Credit three hours a term. Prerequisite, German 1-5, or the equivalent. Professor BOESCHE. M W F 10. *Goldwin Smith* 177.

Exercises conducted in German. Theme-writing. This course is essential for the pursuit of advanced work in the department, and must be completed by students who desire to be recommended as teachers of German.

11. **Schiller's Dramas.** First term. Credit three hours. Prerequisite, German 1-5, or the equivalent. Assistant Professor ANDREWS. M W F 2. *Goldwin Smith* 177.

12. **Schiller's Lyrics.** Second term. Credit three hours. Prerequisite, German 1-5, or the equivalent. Professor BOESCHE. T Th S 10. *Goldwin Smith* 183.

13. **Goethe's Life and Works.** First term. Credit three hours. Prerequisite, German 1-5, or the equivalent. Professor BOESCHE. T Th S 9. *Goldwin Smith* 190.

14. **Goethe's Faust, part I and selected portions of part II.** Second term. Credit three hours. Primarily for juniors and seniors. Prerequisite, German 1-5, or the equivalent. Professor FAUST. T Th S 9. *Goldwin Smith* 190.

15. **Survey of German Literature.** Throughout the year. Credit three hours a term. Prerequisite, reading knowledge of German. Professor FAUST. M W F 9. *Goldwin Smith* 190.

Lectures in English, outlining the history of German literature from the Old High German period to the present time. Collateral reading in German.

[16. **Contemporary German Literature.** Throughout the year. Credit three hours a term. Prerequisite, German 1-5, or the equivalent. Professor FAUST. Not given in 1926-27.]

17. **Nineteenth Century Drama.** Kleist, Grillparzer, Hebbel, Hauptmann. Throughout the year. Credit three hours a term. Prerequisite courses 1-5, or the equivalent. Professor POPE. T Th S 11. *Goldwin Smith* 190.

[18. **Lessing's Life and Works.** First term. Credit three hours. Prerequisite courses 1-5. Professor POPE. Not given in 1926-27.]

37. **Middle High German.** Throughout the year. Credit three hours a term. Prerequisite, German 1-5, 10, and six hours of literature. First term, Assistant Professor ANDREWS. M W F 3. *Goldwin Smith* 178. Second term, Professor POPE. M W F 3. *Goldwin Smith* 177.

[39. **Teachers' Course in German Composition.** Throughout the year. Credit two hours a term. Admission by permission only. Professor BOESCHE. Not given in 1926-27.]

40. **Teachers' Course in Methods.** Second term. Credit two hours. Prereq-

uisite, German 1-5, 10, and twelve hours of advanced work in German literature or philology. Professor FAUST. Th 2-4. *Goldwin Smith* 181.

42. **Gothic.** First term. Credit three hours. Professor BOESCHE. M W F 8. *Goldwin Smith* 188.

43. **Old High German.** Second term. Credit three hours. Prerequisite German 37. Professor BOESCHE. M W F 8. *Goldwin Smith* 188.

48. **Principles of Germanic Philology.** Second term. Credit two hours. Prerequisite German 42. Assistant Professor ANDREWS. M 2-4. *Goldwin Smith* 178. Primarily for graduates.

49. **Seminary in German Literature.** First term. Credit two hours. For graduates only. Professor FAUST. Th 2-4. *Goldwin Smith* 181.

50. **Seminary in German Literature.** Second term. Credit two hours. Professor POPE. T 2-4. *Goldwin Smith* 182.

[52. **Seminary in German Philology.** Second term. Credit two hours. Professor BOESCHE. Not given in 1926-27.]

GOVERNMENT

*1. **American National Government.** First term. Credit three hours. Open to sophomores. Professor CUSHMAN. Lectures, T Th 9. Quiz hours to be arranged. *Goldwin Smith* A.

Historical development, organization, powers, and practical working of the American national government.

*2. **Comparative Government.** First term. Credit three hours. Open to sophomores. Assistant Professor MACKAY. Lectures, M W 10. Quiz hours to be arranged. *Goldwin Smith* 242.

Government and politics of England and Continental Europe, particularly France and Switzerland; tendencies in the new Europe; federal government.

*5. **American State Government.** Second term. Credit three hours. Open to sophomores. Professor CUSHMAN.

Lectures, T Th 9. Quiz hours to be arranged. *Goldwin Smith* A.

A comparative study of American state governments. State constitutions, their origin, nature, and methods of amendment; the organization and functions of the three departments; current political and administrative problems.

[*6. **Political Parties and Popular Government.** Second term. Credit three hours. Open to sophomores. Professor CUSHMAN. Not given in 1926-27.]

*7. **Municipal Government.** Second term. Credit three hours. Open to sophomores. Assistant Professor CATLIN. M W F 8. *Goldwin Smith* 124.

A survey course in the field of municipal government and administration with special reference to the problems of the American city.

*8. **History of Political Thought.** First term. Credit three hours. Open to sophomores. Assistant Professor CATLIN. T Th S 10. *Goldwin Smith* 177.

An introductory course in politics.

10. **Political Philosophy and Science.** First term. Credit three hours. Open to upperclassmen. Assistant Professor CATLIN. F 4 and other hours to be arranged. *Goldwin Smith* 227.

The meaning of a science of politics; the theory of authority, sovereignty, and liberty; toleration and censorship; aristocracy and representative government.

11. **Political Institutions.** Second term. Credit three hours. Prerequisite, Government 2 or equivalent studies. Assistant Professor CATLIN. M W F 10. *Goldwin Smith* 120.

A study of the development and structure of certain political institutions, and of their function in modern society.

14. **Introduction to International Law.** First term. Credit three hours. Open to upperclassmen. Assistant Professor MACKAY. M W F 9. *Goldwin Smith* 234.

Introduction to the fundamental principles of International Law. Case method to be followed.

15. **International Relations and Problems.** Second term. Credit three hours. Open to upperclassmen. Assistant Professors CATLIN and MACKAY. M W F 9. *Goldwin Smith* 124 and 134.

A course in international relations with case problems. The principal factors

influencing the relations between states. The pacific settlement of disputes by diplomacy, arbitration, judicial methods, the League of Nations. Experiments in international administration and cooperation. The attention of students interested in this field is directed to History 45.

20. **Constitutional Law: The American Federal System.** First term. Credit three hours. Open to upperclassmen. Professor CUSHMAN. T Th S II. *Goldwin Smith 234.*

Judicial interpretation of the constitution; the nature of judicial review; separation of governmental powers; relations between state and national government; construction of national powers.

Government 20 and 21 are not designed primarily for pre-law students, but for those having a major interest in government, history, and economics. Attention is called to the fact that the College of Law requires for graduation the regular Law School course in constitutional law.

21. **Constitutional Law: Fundamental Rights and Immunities.** Second term. Credit three hours. Open to upperclassmen. Professor CUSHMAN. T Th S II. *Goldwin Smith 234.*

Privileges and immunities of citizenship; protection of civil and political rights; the obligation of contracts; due process of law and the equal protection of the law. Not designed primarily for pre-law students, but for those having a major interest in government, history, and economics. The College of Law requires its students to complete the Law course in Constitutional Law before graduation.

22. **Seminary in Constitutional Problems.** Throughout the year. Credit two hours a term. Open to graduate students and qualified seniors. Professor CUSHMAN. Day and hour to be arranged.

Problems of current interest in American Constitutional Law will be selected for individual research.

23. **Seminary in Politics.** Throughout the year. Credit two hours a term. Open to graduate students and qualified seniors. Assistant Professor CATLIN. Day and hour to be arranged.

24. **Seminary in International Law and Relations.** Throughout the year. Credit two hours a term. Open to qualified seniors and graduate students. Assistant Professor MACKAY. Day and hour to be arranged.

25. **Social and Political Ethics, and the Philosophical Theory of the State.** (See Philosophy 7a)

26. **Problems of Labor.** (See Economics 44)

27. **Public Revenues.** (See Economics 82)

The attention of students whose upperclass group is History and Government is called to the following courses given in the College of Law. They are open to Arts students only by permission of the Dean, and of the professor in charge of each course. For details see the Announcement of the College of Law.

Administrative Law and Public Officers.

Constitutional Law.

International Law.

Jurisprudence.

Labor Law.

Municipal Corporations.

Law of Public Service and Carriers.

Restraints on Business and Industry.

Taxation.

HISTORY

*1. **Outlines of Ancient History.** Throughout the year. Credit six hours on completion of the course; upperclassmen, four hours only. Professor LAISTNER. M W 9 and an hour to be arranged. *Goldwin Smith A.*

Textbook, lectures, and collateral reading. First term. The Near Eastern countries and Greece to 405 B. C. Second term. Greek and Roman History, 500 B. C. to 330 A. D.

[3. **Greek History, 500 to 323 B. C.** First term. Credit three hours. Prerequisite, History I or the equivalent. Professor LAISTNER. Not given in 1926-27.]

Courses 3, 4 and 5 are designed for those who desire to study a briefer period in more detail and, where possible, with some reference to original authorities.

4. **The Roman Empire, 30 B. C. to 180 A. D.** Second term. Credit three hours. Prerequisite, History I or 3. Professor LAISTNER. M W F 11. *Goldwin Smith 236.*

5. **The Roman Republic, 133 to 30 B. C.** First term. Credit three hours. Prerequisites, History I, 4 or a satisfactory equivalent. Professor LAISTNER. M W F 11. *Goldwin Smith 236.*

Open to sophomores, juniors and seniors. A detailed study of the political history of the period, with some reference to social and economic conditions.

6. **Greek and Roman Writers of History from Herodotus to Procopius.** Throughout the year. Credit four hours on completion of the course. Prerequisites, History I, 3, 4, 5, or a satisfactory equivalent. Professor LAISTNER. T Th 10. *Goldwin Smith 236.*

Open to qualified upperclassmen and graduates with permission of the instructor. Lectures and readings (in translation) of the historical writers of Greece and Rome.

[14. **Seminary in Ancient History.** Throughout the year. Credit two hours a term. Professor LAISTNER. Open to graduates and, by special permission, to seniors. Not given in 1926-27.]

[18. **Oriental History.** Throughout the year. Credit two hours. Professor SCHMIDT. A general survey of the History of Asia. Not given in 1926-27.]

19. **Oriental History.** Throughout the year. Credit two hours. Professor SCHMIDT. A general survey of the history of Africa. T Th 10. *Goldwin Smith 256.* Open only to juniors, seniors, and graduates.

21. **The Middle Ages.** First term. Credit three hours. Professor SMITH. M W F 10. *Goldwin Smith C.*

The history of Christendom from the time of Constantine to the dawn of the Renaissance (300-1300) with special attention to the life of society and to the progress of civilization. Lectures, quizzes, examinations.

22. **The Age of the Renaissance and Reformation.** Second term. Credit three hours. Professor SMITH. M W F 10. *Goldwin Smith A.*

The political, social, and religious history of Christendom during this age of transition, with special attention to the beginnings of modern life and thought.

24. **The Intellectual History of Modern Times.** Throughout the year. Credit two hours. Professor SMITH. T Th 3. *Goldwin Smith 234.*

A genetic account of the cultural life of the intellectual class in modern times (1580-1925), particularly as reflected in the growth of science and in the progress of ideas. Open to juniors and seniors. Lectures and reports.

[26. **Latin Paleography and Diplomatics.** First term. Credit two hours. Prerequisite, a reading knowledge of Latin. Professor SMITH. Not given in 1926-27.]

[27. **The Science of the Renaissance.** Second term. Credit two hours. Prerequisite, a reading knowledge of Latin. Professor SMITH. Not given in 1926-27.]

28. **Church History.** Throughout the year. Credit two hours. Open to graduates and qualified seniors. Prerequisite, a reading knowledge of Latin. Professor SMITH. S 10. *European History Seminary Room, Library.*

Reading and explanation of the sources of Church History, with reports on special topics.

42. **History of Modern Europe.** Throughout the year. Credit three hours a term. Not open to freshmen. Professor BECKER. M W F 3. *Goldwin Smith 242.*

A survey of European history from the beginning of the 17th century to 1914. Political, economic, and intellectual movements emphasized in proportion to their international or European importance.

43. **French Revolution.** First term. Credit two hours. Prerequisite, first term of History 42, or the equivalent. Professor BECKER. T Th 3. *Goldwin Smith 242.*

A study of the Revolution from 1789 to 1795, with a preliminary survey of the organization of French society before 1789.

44. **Napoleonic Era.** Second term. Credit two hours. Prerequisite, first term of History 42, or the equivalent. Professor BECKER. T Th 3. *Goldwin Smith 242.*
A study of the rise and fall of the Napoleonic Empire, 1795-1815.

[45. **The Federation of Europe.** Second term. Credit two hours. Prerequisite, History 42, or the equivalent. Professor BECKER. Not given in 1926-27.]

48. **Seminary in French Revolution.** Professor BECKER.

*61. **English History.** Throughout the year. Credit six hours upon completion of the course; upperclassmen four hours. Professor NOTESTEIN. T Th 10 and one hour to be arranged. *Goldwin Smith B.*

No credit is given for the first term alone.

67. **English History, 1689-1815.** First term. Credit three hours. Open to sophomores, juniors, and seniors. Mr. MARCHAM. T Th S 9. *Goldwin Smith 242.*
A lecture course with assigned readings, mainly social and biographical. Registration by permission of the instructor.

68. **English History, 1815-1927.** Second term. Credit three hours. Open to sophomores, juniors, and seniors. Mr. MARCHAM. T Th S 9. *Goldwin Smith 242.*
A lecture course with assigned readings in biographies, diaries, and such novels and plays as concern the life of the time. Emphasis upon the main political and social movements. Registration by permission of the instructor.

*82. **American History, 1787-1850.** First term. Credit three hours. Open to sophomores, juniors, seniors, and to freshmen in special cases with the approval of their advisers. Professor BRETZ. M W F 9. *Goldwin Smith C.* Apply at *Goldwin Smith 234* on registration day for seat assignment.

Formation of new national government; European complications; domestic problems; rise of sectional parties. Textbook, lectures, and readings.

*83. **American History, 1850-1914.** Second term. Credit three hours. Professor BRETZ. Prerequisite, History 82. M W F 9. *Goldwin Smith C.*

Open to sophomores, juniors, seniors, and freshmen in special cases with the approval of their advisers. Secession and civil war, reconstruction, recent political and constitutional history. Textbook, lectures, and readings.

[84. **Economic History of the United States to 1837.** First term. Credit three hours. Prerequisite, History 1, 61, 82, or 83, or Economics 1 or 2. Professor HULL. Not given in 1926-27; may be expected 1927-28.]

[85. **Economic History of the United States since 1837.** Second term. Credit three hours. Prerequisite, History 84, or an accepted equivalent. Professor HULL. Not given in 1926-27; may be expected in 1927-28.]

86. **Constitutional History of the United States.** First term. Credit two hours. Prerequisite, History 82, 83 or the equivalent. Professor BRETZ. T Th 9. *Goldwin Smith 234.*

Open only to upperclassmen. May not be taken by those who have had Government 20 or Government 21. The leading constitutional questions since the Civil War; the constitutional aspects of current political questions.

[88. **Foreign Relations of the United States.** Second term. Credit three hours. Professor HULL. Not given in 1926-27; may be expected 1927-28.]

89. **American History, 1750-1848: The Settlement of the Middle West.** Second term. Credit two hours. Prerequisite, History 82, 83, or the equivalent. Upperclassmen only. Professor BRETZ. T Th 9. *Goldwin Smith 234.*

[91. **Constitutional History of the Colonies and States to 1787.** First term. Credit three hours. Professor HULL. Not given in 1926-27; may be expected 1927-28.]

[92. **The Establishment of European Empires in America, 1493-1763.** First term. Credit three hours. Prerequisite, History 42, 61, or 82. Not given in 1926-27.]

[93. **The Disintegration of European Empires in America, 1763-1823.** Second term. Credit three hours. Prerequisite, History 92. Professor HULL. Not given in 1926-27.]

[97. **American History.** Investigation of topics in a selected field. Throughout the year. Credit two hours a term. Professor BRETZ. Not given in 1926-27.]

98. **Seminary in American History.** Credit two hours a term. Professor BRETZ. Hours to be arranged. *Library, American History Room.*

For graduates. Open to qualified seniors by permission. First meeting, September 27, 4 P. M.

[101. **Teaching of History.** Second term. Credit two hours. Consult Professor BRETZ. Not given in 1926-27.]

MATHEMATICS

Examinations for the removal of conditions in courses 1 to 8 are held in September just before registration, and near the end of each term. For further information regarding the time and place of these examinations students should apply to Professor Ranum.

All students taking any of the courses from 1 to 15 inclusive should go to White 5 on one of the registration days at the beginning of each term for assignment to sections.

Students wishing to take any of the courses numbered above 15 are asked to meet in White 5 at 3:30 P. M. on the first day of instruction of each term, to confer with the teachers concerning these courses, and to arrange schedules.

Of courses 1-8, not more than six (6) hours may be taken simultaneously without the special permission of the department.

For the two terms of Analytic Geometry and Calculus the stated number of hours credit is granted towards graduation without diminution for upperclassmen, but not more than five hours may be counted towards the satisfaction of an upperclass group requirement in mathematics.

*1. **Solid Geometry.** Repeated in second term. Credit three hours. First term, T Th S 10. Second term, M W F 10.

*2. **Advanced Algebra.** Repeated in second term. Credit five hours. Daily except S 9.

*2f. **Introduction to the Mathematics of Finance.** Repeated in second term. Credit three hours. T Th S 9.

*3. **Plane Trigonometry.** Repeated in second term. Credit three hours. First term, M W F 10; second term, T Th S 10.

4a, 4b. **Analytic Geometry and Calculus.** Primarily for students in the College of Arts and Sciences. Prerequisite, Mathematics 1, 2, 3, or the equivalent.

4a. Daily except S, 8. Credit five hours. Repeated second term.

4b. Daily except S, 8. Credit five hours. Continuation of 4a. Repeated second term.

5a, 5b. **Analytic Geometry and Calculus.** Primarily for students in the College of Engineering. Prerequisite, Mathematics 1, 2, 3, or the equivalent.

5a. Daily except S. Credit five hours. Repeated second term.

5b. Daily. Credit six hours. Continuation of course 5a. Repeated second term.

5a, 7. **Analytic Geometry and Calculus.** Primarily for candidates for the degree of B.Chem. Prerequisite, Mathematics 1, 2, 3, or the equivalent. Daily except S.

5a. Credit five hours. Repeated in second term.

7. Credit five hours. Continuation of 5a. Second term only.

*8. **Analytic Geometry and Calculus.** Throughout the year. Credit three hours a term. Prerequisite, Mathematics 1, 2, 3, or the equivalent.

Primarily for students in the College of Architecture.

*15. **Elementary Course in Higher Mathematics.** Throughout the year. Credit three hours a term. Prerequisite, Mathematics 1, 2, 3, or the equivalent. Professor RANUM. T Th S 9. *White 9.*

Students who have had the equivalent of any part of Mathematics 4a, 4b may receive only partial credit for the second term.

Intended for students who do not plan to take many courses in mathematics, but who wish to become acquainted with the principal ideas of the subject. The object will be to make clear the fundamental aims, methods, and results of a number of subjects, rather than to develop the technique of any one. The course will deal with the theory of numbers, vector analysis, groups; synthetic geometry, including some topics in projective, non-euclidean, and higher dimensional geometry; analytic geometry, calculus, famous problems of mathematics. Lectures, assigned reading, and exercises.

20. **Teachers' Course.** Throughout the year. Credit three hours a term. Prerequisite or parallel course, Mathematics 4b. Assistant Professor CRAIG. T Th S 10. *White 5.*

A review of the methods of proof of important topics in algebra and geometry; an attempt to give perspective to elementary mathematics by showing the coordination between the parts.

23. **Modern Higher Algebra.** Throughout the year. Credit three hours a term. Prerequisite, Mathematics 4a, 4b, or the equivalent. Professor SHARPE. M W F 10. *White 27.*

First term, algebraic equations, transformation of equations, determinants, elimination, cubic and biquadratic equations; invariants and covariants. Second term, determinants, linear equations, matrices, linear transformations, invariants, bilinear forms, quadratic forms, elementary divisors. The work of the first and that of the second term are independent.

41. **Elementary Differential Equations.** Repeated in second term. Credit three hours a term. Prerequisite, Mathematics 4b or the equivalent. Assistant Professor CRAIG. T Th S 12. *White 5.*

42. **Advanced Calculus.** Throughout the year. Credit three hours a term. Prerequisite, Mathematics 4b or the equivalent. Assistant Professor OWENS and Mr. FRALEIGH. M W F 11. *White 2 and White 21.*

A study of the processes of the calculus, their meanings and applications. It is designed to furnish a necessary preparation for advanced work in analysis and applied mathematics.

43. **Theory of Functions of Real Variables.** Throughout the year. Credit three hours a term. Prerequisite, Mathematics 42. Professor HURWITZ. *White 6.*

The number system; point sets; Cantor's transfinite numbers; generalizations of the properties of continuity, differentiation, integration and summation.

47. **Theory of Differential Equations.** Throughout the year. Credit three hours a term. Prerequisite, Mathematics 41, 42, or the equivalent. Mr. WOLFENDER.

Linear differential equations of order n . The existence theorems. Systems of linear differential equations. Partial differential equations. Applications to geometry and physics.

49. **Linear Equations in an Infinite Number of Variables.** Throughout the year. Credit three hours a term. Prerequisite, Mathematics 42 or the equivalent. Professor GILLESPIE. *White 1.* Assigned reading and reports on the origin of the problems, methods of solution and application of results.

61. **Projective Geometry.** Throughout the year. Credit three hours a term. Prerequisite Mathematics 4b or the equivalent. Professor CARVER. M W F 9. *White 10.* The elements of projective geometry treated synthetically.

62. **Advanced Analytic Geometry.** Throughout the year. Credit three hours a term. Prerequisite, Mathematics 4b or the equivalent. Professor RANUM. *White 9.*

An introduction to modern methods, including the use of homogeneous coordinates and of tetracyclic and pentaspherical coordinates.

65. **Algebraic Surfaces.** Throughout the year. Credit three hours a term. Prerequisite, Mathematics 23, 61, 62, or their equivalents. Professor SNYDER. *White 24.*

Rational surfaces; plane representation. Geometry on an algebraic surface by the methods of the modern Italian school.

83. **Theory of Probabilities.** Throughout the year. Credit three hours a term. Prerequisite, Mathematics 4b or its equivalent. Professor HURWITZ. T Th S 10. *White 6.*

Theory of probabilities with applications to problems in statistics, curve fitting, theory of errors, life-tables, insurance, correlation.

86a. **Potential Theory.** First term. Credit three hours. Prerequisite, Mathematics 4b or its equivalent. Mr. PORITSKY.

Newtonian and logarithmic potentials with application to gravitation and electromagnetism. Dirichlet's problem. Conformal mapping.

86b. **Fourier Series and Integrals.** Second term. Credit three hours. Prerequisite, Mathematics 4b or its equivalent. Mr. PORITSKY.

Expansion of functions in Fourier and allied series and integrals. Applications to the quantum theory. Harmonic analysers.

100. **Problems and Research.**

The following additional courses are offered at intervals of two to three years: Theory of Numbers; Theory of Groups; Infinite Series; Divergent Series; Functions of a Complex Variable; Integral Equations; Calculus of Variations; Differential Geometry; Algebraic Curves; Line Geometry; Geometry of Hyper-space; Non-Euclidean Geometry; Vector Analysis; Differential Equations of Mathematical Physics; Hydrodynamics and Elasticity.

MUSIC

The courses offered by the Department of Music are designed to afford to all students having sufficient native ability the opportunity to study music as a part of the college course. The aim is to make musical training contribute to liberal culture.

Credit for Courses 1, 6 and 7 may be counted as part of the thirty hours which a student may elect outside of the College of Arts and Sciences, but may not be counted as part of the ninety hours required in the College. (See paragraph 1, p. 11.)

Application for admission to the Morning Choir (Course 6), the Advanced Choir (Course 7), and to Courses 1, 10, and 16, of new students and others not previously classified should be made at Morse Hall 102, daily, Wednesday to Friday, September 22-24, from 9 to 12 A. M.

1. **Elementary.** Throughout the year. Credit four hours on completion of the course, no credit for first term alone. Primarily for freshmen, but open to all students showing sufficient aptitude to pursue the subject with profit. Assistant Professor SMITH. T 7:15, *Sage Chapel*. W 4:45, *Morse Hall*.

Ear training; elementary sight reading; elementary theory, including the construction of scales; musical dictation and intervals; the elements of musical design and phraseology. The chief purpose of this course is to train the musical faculties of the student in order to furnish a basis for discriminating musical listening. The course, or its equivalent, is fundamental to all other courses in music.

6. **Sage Chapel Morning Choir.** Throughout the year. Two hours credit on the completion of the course; no credit for first term alone. Prerequisite, ability to sing simple music. Professor KINKELDEY and Assistant Professor SMITH. Sunday 10 to 12:30. *Sage Chapel*.

The practice period of this choir is designed to supplement the theoretical training of Music 1 (not obligatory) with a course in voice training.

For admission to this course see general departmental note above.

7. **Advanced Choir.** Throughout the year. Credit four hours on completion of the year. Prerequisite, a singing voice and the ability to read at sight music of moderate difficulty. Professor KINKELDEY. M 7:15-9, W 4:45, Sunday 2:30. *Sage Chapel*.

Preparation and presentation of choral classics, old and new. This course may not be repeated for credit; for admission see general departmental note above.

10. **Harmony.** Throughout the year. Credit three hours a term. Prerequisite, Music 1 or the equivalent. Assistant Professor SMITH. M W F 9. *Morse 105*.

The construction and interconnection of triads and their inversions; chords of the seventh and their inversions; chords of the ninth, chromatic harmony, suspensions and ornamental tones; harmonizing both bass and soprano melodies.

16. **Counterpoint.** Throughout the year. Credit two hours a term. Prerequisite, Music 10 or the equivalent. Assistant Professor SMITH. T Th 9. *Morse 105*.

A course dealing with the principles of melodic combination.

17. **The Art of Music.** Throughout the year. Credit three hours a term. Open to upperclassmen. Professor KINKELDEY. M W F 11. *Morse 105*.

The fundamental acoustic, psychological, theoretical, aesthetic, and historical factors which enter into a rational understanding and enjoyment of the art.

21. **History of Music.** Throughout the year. Credit two hours a term. Open to upperclassmen and graduates. Professor KINKELDEY. T Th 10. *Morse 105*.

A complete survey of the evolution of the art of music, with particular reference to questions of style and to the place of music in the artistic and social life of nations. First term, the music of primitive and exotic nations, of antiquity, and of the Middle Ages. Second term, from the sixteenth century to the present day.

22. **Seminary in Musicology.** Throughout the year. Credit two hours a term. Primarily for graduates (and by permission, to seniors) who have the requisite reading knowledge of one or more of the important foreign languages, a fair knowledge of musical theory, and some skill in practical music. Hours to be arranged. Professor KINKELDEY.

The work is intended to make the student acquainted with the accomplishments of the past and with modern methods and aims in all fields, scientific, aesthetic, and historical, of musical research and investigation. Special topics or fields of study will be selected for each term after consultation with the class.

26. **The Life and Works of John Sebastian Bach.** First term. Credit two hours. Professor KINKELDEY. T Th 3. *Morse* 105.

With particular reference to the style of the greatest musician before Beethoven.

27. **The Pianoforte and its Music.** Second term. Credit two hours. Professor KINKELDEY. T Th 3. *Morse* 105.

A study in the changes in style and in the evolution of technique as shown in the works of the great composers and the influence of the masters of the keyboard.

PHILOSOPHY

*1. **Problems of Philosophy.** First term. Credit three hours. Professor THILLY, Dr. PAINE, and Mr. FISCH. M W F 11. *Goldwin Smith* 225.

The fundamental problems of philosophy, together with a critical study of the most important types of philosophical theory.

*2. **Logic.** First term. Credit three hours. Dr. PAINE. M W F 12. *Goldwin Smith* 227.

This course will cover practically the same ground as course 3, which is given in the second term.

*3. **Logic.** Second term. Credit three hours. Assistant Professor SMART. M W F 11. *Goldwin Smith* 256. Dr. PAINE. T Th S 9. *Goldwin Smith* 227.

The general character of the thinking process, its laws of development, and the methods by which thought actually proceeds to solve problems presented to it, in both the deductive and inductive processes of reasoning.

4. **The Fine Arts, Their Philosophy and History in Outline.** First term. Credit three hours. Professor HAMMOND. T Th S 10. *Goldwin Smith* A.

An elementary course on aesthetics. Lectures, assigned readings, and examinations.

4a. **The Renaissance.** Second term. Credit three hours. Professor HAMMOND. T Th S 10. *Goldwin Smith* A.

Lectures and assigned readings. A philosophical study of the civilization of the Renaissance, with special reference to the fine arts, the rise of humanism, and the beginnings of modern philosophical and political theories.

5. **History of Philosophy.** Throughout the year. Credit three hours a term. Professors HAMMOND and THILLY. T Th S 9. *Goldwin Smith* 225.

The history of philosophical speculation from its origin among the Greeks to the present time; the various philosophical systems in their relation to the science and general civilization of the ages to which they belong, and their application to social, political, and educational problems. Lectures, assigned readings, and reports. Open to juniors, seniors, and graduates.

*6. **Moral Ideas and Practice.** Second term. Credit three hours. Professor THILLY. M W F 11. *Goldwin Smith* 225.

The development of moral ideas, ideals, and philosophies from early times to the present, with special emphasis on the great civilizations of the Occident.

7. **Ethics.** First term. Credit three hours. Open only to juniors, seniors, and graduates. Professor THILLY. M W F 10. *Goldwin Smith* 225.

A study of the moral consciousness and of theories of right and wrong with a view to reaching a philosophy of life.

7a. **Social and Political Ethics.** Second term. Credit three hours. Open

only to juniors, seniors, and graduates. Professor THILLY. M W F 10. *Goldwin Smith 225.*

A study of the philosophical principles underlying our social, legal, and political conceptions.

8. **Idealism: Platonic and Modern.** Throughout the year. Credit two hours a term. Open only to juniors, seniors and graduates. Assistant Professor SMART. W F 9. *Goldwin Smith 225.*

An introduction to the philosophy of Plato and to some related tendencies and developments in modern thought—Berkeley, Kant, Fichte, Hegel, etc. Lectures and discussions.

9. **Philosophical Ideas in Nineteenth Century Literature.** First term. Credit three hours. Professor ALBEE. M W F 12. *Goldwin Smith 225.*

After considering the tendencies of eighteenth century thought, the course will deal with the interpretations of life offered by well known authors of the nineteenth century, English, continental, and American, and the relation of such interpretations to the recognized tendencies of contemporary philosophy. Primarily for juniors and seniors.

9a. **The Philosophy of William James.** Second term. Credit two hours. Professor ALBEE. M W 12. *Goldwin Smith 225.*

A study of pragmatism as developed in the writings of William James. Lectures and discussions. Primarily for juniors and seniors.

12. **The Theory of Evolution.** Throughout the year. Credit one hour a term. Not open to underclassmen. Dr. PAINE. S 11. *Goldwin Smith 227.*

History of the evolutionary theory followed by discussion of its philosophical bearings.

13. **Origin and Development of Religious Ideas.** First term. Credit two hours. Not open to underclassmen. Dr. PAINE. T Th 12. *Goldwin Smith 225.*

The origin of religious belief and the conditions of its development. The history and significance of some of the more highly developed religions, such as Buddhism, Mohammedanism, and Christianity.

14. **Psychology and Philosophy of Religion.** Second term. Credit two hours. Not open to underclassmen. Dr. PAINE. T Th 12. *Goldwin Smith 225.*

Psychological analysis of some of the more important types of contemporary individual and social religious experience; relation of religion to science; the question of the place of religion in a philosophical account of the world.

15. **The Logic of Science.** First term. Credit three hours. Open to juniors, seniors, and graduates. Assistant Professor SMART. M W F 11. *Goldwin Smith 221.*

A study of the nature of scientific inference, in the light of the historical development of leading scientific conceptions, and in relation to philosophy.

16. **Reading of Philosophical German.** Throughout the year. Credit two hours. Professor HAMMOND. F 2-4. *Goldwin Smith 220.*

For the orientation of graduates and advanced students in German philosophical terminology.

17. **Problems in Metaphysics.** First term. Credit two hours. Primarily for graduates. Assistant Professor SMART. T Th 10. *Goldwin Smith 227.*

The subject for the year 1926-27 will be: The rise of the historical method in philosophy.

20. **History of Ethics, Ancient, Mediaeval, and Renaissance.** First term. Credit two hours. Professor HAMMOND. M W 11. *Goldwin Smith 220.*

Lectures and assigned readings. Primarily for seniors and graduates.

21. **History of Modern Ethics.** Second term. Credit two hours. Professor ALBEE. T Th 12. *Goldwin Smith 220.*

The history of modern ethics, with special reference to the commonly recognized methods of ethics. The history of British Ethics will receive particular attention, as illustrating the gradual differentiation of ethics as an independent philosophical discipline.

26. **The Ethics of Modern Utilitarianism.** Throughout the year. Credit three hours a term. Open to qualified seniors and graduates. Professor THILLY. Th 3-5:30. *Goldwin Smith 220.*

27. **The Republic of Plato.** Throughout the year. Credit three hours a term. Professor HAMMOND. T 3-5 or hours to be arranged. *Goldwin Smith 220.*

Reading and interpretation of the Greek text.

[29. **Modern Idealistic Theory of Ethics.** Throughout the year. Credit three hours a term. Primarily for graduates. Professor THILLY. Not given in 1926-27.]

30. **Empiricism and Rationalism.** First term. Credit three hours. Professor ALBEE. T Th S 11. *Goldwin Smith 220.*

Lectures and discussions. The empirical movement as represented by Locke, Berkeley, and Hume, and the rationalistic movement as represented especially by Leibniz. Primarily for graduates.

31. **The Critical Philosophy of Kant.** Second term. Credit three hours. Professor ALBEE. T Th S 11. *Goldwin Smith 220.*

Lectures and discussions. A study of the *Critique of Pure Reason* and of the *Critique of Judgment*, with frequent references to standard commentaries and to more recent interpretations. Primarily for graduates.

32. **Early Rationalism: Spinoza and Leibniz.** First term. Credit two hours. Professor ALBEE. T Th 12. *Goldwin Smith 220.*

A critical study of early Rationalism, with special reference to the divergent tendencies represented by Spinoza and Leibniz. Primarily for graduates.

[34. **Modern British Idealism.** Second term. Credit two hours. Professor ALBEE. Not given in 1925-26.]

37. **Seminary in Ethics.** Throughout the year. Credit two hours. Open only to graduates. Professor THILLY. Hours to be arranged. *Goldwin Smith 220.*

38. **Seminary in Ancient and Mediaeval Philosophy.** Throughout the year. Credit two hours a term. Professor HAMMOND. M 3-5, or hours to be arranged. *Goldwin Smith 220.*

40. **Seminary in Logic and Metaphysics.** Throughout the year. Credit two hours a term. For graduate students only. Assistant Professor SMART. W 3, or hours to be arranged. *Goldwin Smith 220.*

The subject for the year 1926-27 will be Hegel's Logic.

41. **Seminary in Aesthetics.** Throughout the year. Credit two hours a term. Professor HAMMOND. Hours to be arranged. *Goldwin Smith 220.*

Historical study of aesthetic theories. Primarily for graduates, and open to seniors only by permission.

PHYSICAL EDUCATION

The following courses are designed, not only to train teachers and directors of physical education in public schools and colleges, but also to train directors of physical and social welfare departments in large banking and industrial plants as well as specialized assistants in various public and private institutions. A four-year undergraduate course has been outlined to meet the requirements for the New York State Teacher's Certificate in Physical Education, copies of which may be obtained upon application.

20a. **History and Literature of Physical Education.** First term. Credit two hours. Professor YOUNG. T Th 8. *Goldwin Smith 236.*

For juniors and seniors. The distinguishing characteristics of various peoples, as to habits of living and forms of physical activity; the part these have played in their national development.

20aa. **Modern Developments in Physical Education.** Second term. Credit two hours. Professor YOUNG. T Th 8. *Goldwin Smith 236.*

A continuation of course 20a, dealing with the history and various aspects of the physical education movement in Europe and America.

20b. **Theory of Physical Education and Methods of Teaching.** Second term. Credit two hours. Professor JORDAN. M W 11. *Goldwin Smith 227.*

For juniors and seniors. The objects and scope of physical education; the principles and technique involved in its teaching, arrangement, classification, and progression of exercises.

21. **Organization and Administration of Play, Athletics, and Gymnastics.**

Second term. Credit three hours. Professor YOUNG and instructors. M W F 8, *Goldwin Smith* 236.

For juniors and seniors. The social and educational value of play, with special emphasis upon the management and supervision of athletic sports, recreation centers, scouting activities, etc.

22a. **School and Industrial Hygiene.** First term. Credit two hours. Professor YOUNG and Dr. GOULD. T Th 12. *Goldwin Smith* 242.

For juniors and seniors. Sanitary aspects of school and factory environment; methods and scope of health instruction and supervision.

22aa. **First Aid.** Repeated in second term. Credit one hour. Dr. SHOWACRE and Professor YOUNG. First term, F 8; second term, F 12. *Goldwin Smith* 236.

First aid measures to be used in cases of emergency and their practical application.

22b. **Physical Inspection.** Second term. Credit two hours. Dr. GOULD and Professor YOUNG. T Th 12. *Goldwin Smith* 242.

For juniors and seniors. The defects and deformities met with in the school room; the nature, causes, signs, and symptoms of the more common diseases.

23. **Kinesiology, Physiology and Prescription of Exercise.** First term. Credit three hours. Dr. GOULD and Professor YOUNG. M W F 12. *Goldwin Smith* 236.

For juniors and seniors. The anatomical mechanics of movement; the technique and effects of therapeutic gymnastics, corrective appliances, and massage.

24. **Anthropometry.** Second term. Credit one hour. Prerequisite or parallel course Education 15. Professor YOUNG. F 11. *Goldwin Smith* 248.

Physical measurements and their practical application to problems of growth and development.

PHYSICS

Students who wish to continue the study of Physics after completing one of the introductory courses are advised to consult with some member of the Physics Faculty, who will be glad to advise them regarding the courses best suited to their needs or interests. Those who desire to follow Physics as a profession, either in education or in research or testing laboratories, should also consult with the department concerning the opportunities in the field.

In general those who intend to specialize in Physics should take Courses 61, 62, and 65, which are prerequisite to more advanced work. For those who do not wish to specialize, but who have a general interest in the subject, elections from Courses 45, 55, 61, 62, 551, 611, 612, and 621 are suggested.

Students expecting to elect Physics for their upperclass group are advised to complete Mathematics 4 or its equivalent before the beginning of the junior year.

Examinations for those who were unavoidably absent from either term examination in courses 3 to 6, and for those who have conditions to make up, will be held on Wednesday, September 22, 1926, at 9 a. m. in Rockefeller A. Similar examinations in connection with courses 28 to 65 will be held in Rockefeller A at 2 p. m. on the same day. Students expecting to take any of these examinations should notify the department no later than September 15, 1926.

Entrance Physics is not accepted as an equivalent of any of the courses offered by the department.

LECTURES BY PROFESSOR H. A. LORENTZ

During the first term Professor H. A. Lorentz of the University of Leiden will be in residence at Cornell and will deliver a course of lectures on the Jacob H. Schiff Foundation. (See Course 400.)

GENERAL COURSES

*3. **Introductory Experimental Physics.** First term. Credit three hours. Lectures, Assistant Professor HOWE. W F 9 or W F 11. *Rockefeller A.* Laboratory, Messrs. BARNES, CHILDS, FISHER, GARTLEIN, KINKAID, LARSEN, WAR-

BURTON and WHITE. One two-hour period a week to be arranged. *Rockefeller* 220.

Demonstration lectures and laboratory work covering properties of matter, sound, and light.

Courses 3 and 4 form a continuous first course. Course 4 may be taken before course 3 if this sequence is preferred.

*4. **Introductory Experimental Physics.** Second term. Credit three hours. Lectures, Professor MERRITT. W F 9 or W F 11. *Rockefeller* A. Laboratory, Messrs. BARNES, CHILDS, FISHER, GARTLEIN, KINCAID, LARSEN, WARBURTON, and WHITE. One two-hour period a week to be arranged. *Rockefeller* 220.

Demonstration lectures and laboratory work covering heat, magnetism, and electricity.

*5. **Introductory Physics.** Second term. Credit five hours. Assistant Professor COLLINS and Mr. BLESS. Lectures, T Th S 12. *Rockefeller* A. Two recitations to be arranged.

Open only to candidates for B. Chem.

*6. **Introductory Physics.** Repeated in second term. Credit six hours. Prerequisite, equivalent of Mathematics 1-3; Entrance Physics desirable. Professor BIDWELL, Assistant Professor COLLINS, and Messrs. BEHR, COLE, KRUGER, PARMLEY, and WELCH. Lectures T Th S 12. *Rockefeller* A. Three recitations to be arranged.

Required of students in Engineering.

28. **General Physics.** First term. Credit two hours. Prerequisite, Physics 6 and Mathematics 5a, 5b. Professor BIDWELL and Messrs. STANTON, HANSON, MAY, MOREHOUSE, RUSSELL, SEEMANN, and SCOTT. Day and hour to be arranged. *Rockefeller*.

Theory and problems covering selected topics in mechanics, properties of matter, sound, and heat. Required of candidates for the degree of M. E. or E. E.

29. **General Physics.** Second term. Credit two hours. Prerequisite, Physics 28. Staff as in Course 28. Day and hour to be arranged. *Rockefeller*.

Continuation of Physics 28. Selected topics in light and electricity. Required of candidates for the degree of M. E. or E. E.

31. **Heat and Light.** First term. Credit two hours. Prerequisite, Physics 5 and Mathematics 5a. Professor BIDWELL and Dr. SCOTT. M W 10, T Th 8. *Rockefeller*.

Theory and problems. Required of candidates for B. Chem.

32. **Magnetism and Electricity.** Second term. Credit two hours. Prerequisite, Physics 31 or equivalent. Professor BIDWELL and Dr. SCOTT. M W 10. T Th 9. *Rockefeller*.

Theory and problems. Required of candidates for B. Chem.

34. **Physical Measurements.** Throughout the year, starting either term. Credit two hours a term. Prerequisite, Physics 6 and Mathematics 5a and 5b. Professor RICHTMYER and instructors. Eight sections, to be assigned. *Rockefeller* 250.

Physical measurements in properties of matter, mechanics, heat, light, sound, magnetism and electricity; the adjustment and use of instruments of precision. Required of candidates for B. Chem., M.E., and E.E.

45. **Brief Survey of Modern Physical Theories.** Second term. Credit three hours. Prerequisite, Physics 14 or 65, and Mathematics 4a and b. Professor RICHTMYER. Lectures, M W F 11. *Rockefeller* C.

A brief historical summary of the development of Physics up to 1900, followed by a discussion of the electromagnetic theory, photoelectricity, electron theory, radiation, quantum theory, X-rays, and the bearing of these on the structure of the atom and on other problems of modern Physics.

55. **Introductory Physical Experiments.** Either term. Credit three hours. Prerequisite, Physics 1 and 2, or 3 and 4, or 6, or the equivalent. Assistant Professor TUCKER and Mr. MAY. T Th 8-10:30, T Th 2-4:30, W F 2-4:30. *Rockefeller* 300-B.

Two laboratory periods a week, with reports. Fundamental experiments covering properties of matter, heat, light, sound, magnetism, and electricity. Pri-

marily intended for students in the College of Arts and Sciences who wish a general knowledge of experimental Physics.

61. General Physics. First term. Credit three hours. Prerequisite, Physics 4, or the equivalent. Assistant Professor COLLINS. M W F 8. *Rockefeller* 107.

Primarily for students in Arts and Sciences. Classroom work covering heat, magnetism, and electricity.

62. General Physics. Second term. Credit three hours. Prerequisite, 4, or the equivalent. Assistant Professor COLLINS. M W F 8. *Rockefeller* 107. Physics 3, or the equivalent. Assistant Professor HOWE, M W F 8. *Rockefeller* 107.

Primarily for students in Arts and Sciences. Classroom work covering properties of matter, sound, and light.

Physics 61 and 62 are designed to meet the needs of students who desire a somewhat detailed survey of the fundamentals of Physics. Physics 61 may be taken either before or after 62.

65. Physical Measurements. Either term or throughout the year. Credit two or four hours a term. Prerequisite, Mathematics 4a, 4b, and Physics 62. must precede or accompany the first half and Physics 61, the second half of Physics 65. Professor RICHTMYER and Mr. MERTZ. One three-hour laboratory period a week on T or Th 8-1. *Rockefeller* 250.

Quantitative laboratory work in mechanics, heat, light, sound, electricity, and magnetism, with special reference to methods of measurement, sources of error, the adjustment and use of instruments of precision, and graphical methods of interpreting results. Primarily for students in Arts and Sciences.

91. The Teaching of Physics in Secondary Schools. Second term. Credit two hours. Prerequisite, courses 55, and 61 or 62. Mr. FISHER. M W 10, or hour to be arranged.

This course fulfils a part of the requirement for the New York State Teacher's Certificate.

95. History of Physics. First term. Credit three hours. Prerequisite, Physics 3 and 4 or equivalent. Professor ———. T Th S 10. *Rockefeller*.

General history of science from the earliest times, with special reference to the physical sciences.

105. Advanced Laboratory Practice. First term. Credit three hours. Prerequisite Physics 55 or 65 (four hours). Assistant Professor TUCKER and Mr. WILBER. Lectures, T 2. *Rockefeller* 301.

One lecture and two laboratory periods a week. Considerable time will be spent on each of a small number of experiments selected to meet the requirements of the individual student. The lectures will include an introductory discussion of the theory of measurements and applications to laboratory problems.

106. Advanced Laboratory Practice. First and second term. Credit one to three hours, depending on the amount of work done. Prerequisite, ordinarily the same as Physics 105. Admission after consultation with the instructor. Assistant Professor TUCKER; in certain fields of experimentation other members of the department will cooperate in directing the work. *Rockefeller* 301.

111. Mechanics. First term. Credit three hours. Prerequisite, Physics 62, 65 (two hours), and Mathematics 4. Professor GIBBS. M W F 8. *Rockefeller*. This course is given in alternate years.

An introductory study of analytical mechanics, based upon Jean's "Theoretical Mechanics."

112. Properties of Matter. Second term. Credit three hours. Prerequisite, Physics 111. Professor BIDWELL. M W F 8. *Rockefeller*. This course is given in alternate years.

A study of the subjects of Gravitation, Elasticity, Surface Tension, and Viscosity.

[120. **Electricity and Magnetism.** Throughout the year. Credit three hours a term. Prerequisite, Physics 61, 62, 65 (four hours), and Mathematics 4. Assistant Professor MURDOCK. This course is given in alternate years. Not given in 1926-27.]

130. **Light.** Second term. Credit three hours. Prerequisite, Physics 62, 65 (two hours), and Mathematics 4 or the equivalent. Assistant Professor HOWE. T Th S 10. *Rockefeller.* This course is given in alternate years.

[140. **Heat.** Second term. Credit three hours. Prerequisite, Physics 61, 62, 65 (two hours), and Mathematics 4. Professor BIDWELL. T Th S 10. This course is given in alternate years. Not given in 1926-27.]

[160. **Wave Motion and Sound.** First term. Credit three hours. Prerequisite, Physics 62, 65 (two hours), and Mathematics 4 or the equivalent. Assistant Professor COLLINS. This course is given in alternate years. Not given in 1926-27.]

170. **Introduction to Modern Physical Theories.** Throughout the year. Credit three hours a term. Prerequisites, Physics 120 or 130 or the equivalent. Professor RICHTMYER. First term, T Th S 10. Second term, hours to be arranged. *Rockefeller.* This course is given in alternate years.

Early theories; a brief survey of the electromagnetic theory, photo-electricity, electron theory, radiation and the quantum theory, X-rays, atomic structure. Intended for seniors specializing in Physics, and for first-year graduate students.

[211. **Mechanics.** Throughout the year. Credit three hours a term. Prerequisite, Physics 111. Primarily for graduates. Assistant Professor KENNARD. Not given in 1926-27.]

220. **Electricity and Magnetism.** Throughout the year. Credit three hours a term. Prerequisite, Physics 120 or the equivalent. Primarily for graduates. First term, Professor MERRITT; second term, Assistant Professor COLLINS. T Th S 8. *Rockefeller.*

The classical theory and its interpretation in terms of electrons, omitting some parts that involve specialized mathematics; the modern theory of radiation and of the electromagnetic field.

[230. **Physical Optics.** First term or throughout the year. Credit three hours. Prerequisite, Physics 130 or the equivalent. Primarily for graduates. Assistant Professor HOWE. Not given in 1926-27.]

[240. **Applications of Thermodynamics in Physics.** First term. Credit two hours. Prerequisite, Physics 140 or the equivalent. Professor MERRITT. Not given in 1926-27.]

300. **Physics Seminary.** Throughout the year. Credit one hour a term. For seniors and graduates. Professor MERRITT. M 3:15. *Rockefeller C.*

SPECIAL TOPIC COURSES

400. **Modern Physical Theories.** First term. Three lectures a week until the Christmas recess. Professor H. A. LORENTZ. T Th S 11. *Rockefeller.* See special announcements.

[401. **Theory of Measurements.** Second term. Credit two hours. Prerequisite, Physics 105. Assistant Professor MURDOCK. Not given in 1926-27.]

415. **Special Topics in Physics.**

For graduates. Reading in any branch of physics, experimental or theoretical, under the guidance of some member of the staff, supplemented by reports and regular conferences. In theory, possible topics among many are,—elasticity, fluid motion, theory of sound, the electromagnetic field, or a narrower field including its recent developments may be chosen.

[425. **Aerodynamics and the Mechanics of Flight.** Second term. Credit two hours. Prerequisite, Physics 14. Professor BEDELL. M F 10. *Rockefeller 155.* Not given in 1926-27.]

[473. **Kinetic Theory and Quantum Theory.** First term. Credit three hours. Professor KENNARD. Primarily for graduates. Not given in 1926-27.]

[480. **Quantum Mechanics.** Second term. Credit three hours. Assistant Professor KENNARD. Primarily for graduates. Not given in 1926-27.]

505. **High Temperature Measurements.** Second term. Credit three hours. Prerequisite, Physics 14 or 65. Professor BIDWELL.

525. **Thermodynamics.** Throughout the year. Credit three hours. Prerequisite, Mathematics 41. Mathematics 42 is recommended. Professor TREVOR. Day and hour to be arranged.

551. Photography. Second term. Credit three hours. Prerequisite, Elementary course in Physics and Chemistry. Mr. RIDDLE. Lectures, T Th 11. *Rockefeller B. Laboratory, T or W 2-5. Rockefeller 332.*

Photographic optics; the technique, physics, and chemistry of photographic processes, with special reference to latent image theory, theory of development, and sensitometry, scientific and technical applications.

555. Special Topics in Photography. Second term. Credit variable. Prerequisite, according to nature of work selected. Mr. RIDDLE. Day and hour to be arranged. *Rockefeller 332.*

To meet the needs of those who wish to utilize photography in some specialized field of investigation, to make further study of some phase of the photographic process, or to take up some problem in photographic research.

[571. Spectroscopy and Luminescence. Throughout the year. Credit two hours a term. Prerequisite, Physics 130 or its equivalent. Professor GIBBS. M W 9 or as arranged. *Rockefeller.*

A somewhat detailed study of the more important experimental and theoretical aspects of these fields. Lectures and assigned readings. Given in alternate years. Not given in 1926-27.]

573. Spectroscopy and Luminescence. First term. Credit variable. Prerequisite, Physics 105 and 130, or the equivalent. Professor GIBBS and ———. Day and hour to be arranged. *Rockefeller.*

Laboratory work for a limited number of students.

581. Atomic Structure. Second term. Credit three hours. For graduate students only. Professor GIBBS. Given in alternate years.

The development of modern atomic theory and its application in the explanation of spectral series, resonance, and ionizing potentials, and fine structure; the structure of the nucleus as revealed by radioactive and isotopic phenomena and the effects of high speed bombardment.

[591. X-Rays and the Structure of Matter. First term. Credit three hours. For graduate students only. Professor RICHTMYER. M W F 11. *Rockefeller.*

This course is given in alternate years. Not given in 1926-27.]

[605. Conductivity and Magnetism. First term. Credit two hours. Professor KENNARD. Not given in 1926-27.]

[611. Electric Waves and Oscillations. First term. Credit one hour. Prerequisite, Introductory Physics. Professor MERRITT. M 12. *Rockefeller B.* Experimental lectures. Given in alternate years. Not given in 1926-27.]

612. Special Topics in Recent Experimental Physics. Second term. Prerequisite, Introductory Physics. Professors MERRITT, RICHTMYER, and GIBBS. M 12. *Rockefeller B.*

The subject matter of this course will change from year to year. May be taken as a continuation of course 611.

613. Electric Waves and Oscillations. Second term. Laboratory. Credit one to four hours. Prerequisite, Physics 65 and 611, or the equivalent. Professor MERRITT and Mr. ZIMMERMAN. Day and hour to be arranged.

621. Electrical Conduction in Gases. Prerequisite, Introductory Physics. Professor MERRITT. Experimental lectures. Given in alternate years.

[623. Electrical Conduction in Gases. First term. Credit three hours. Assistant Professor TUCKER. Not given in 1926-27.]

625. Measurement of Photo-Electric, Thermionic and Ionization Currents. Second term. Credit three hours. Prerequisite, Physics 65, or the equivalent. Assistant Professor TUCKER. *Rockefeller 301.*

One lecture and two laboratory periods a week. The production and measurement of high vacua; thermionic emission and characteristics of vacuum tubes; determination of the charge and of the ratio of charge to mass of the electron; practical measurements in radioactivity.

633. Alternating Currents. First term. Credit two hours. Prerequisite, Physics 14, or 65. Professor BEDELL. M W 11. *Rockefeller 155.*

A study of the underlying principles of alternating currents; the development of graphical methods of analysis as a basis for testing and for the solution of practical problems.

634. **Electrical Laboratory.** Either term, or throughout the year. Credit variable. Prerequisite, Physics 14 or 65. Professor BEDELL and Mr. REICH. Daily 9-1. *Rockefeller.*

Direct and alternating current measurement, and the investigation of special problems. The character of the work will be varied to meet individual needs.

636. **Advanced Alternating Currents.** Second term. Credit two hours. Prerequisite, Physics 633. Professor BEDELL. T Th 11. *Rockefeller* 155.

Discussion of the theory and measurement of alternating currents. A seminary for graduates.

637. **Theses in Applied Electricity.** Second term or throughout the year. Credit two to eight hours a term. Prerequisite, Physics 14 and 65. Professor BEDELL. Day and hour to be arranged. *Rockefeller.*

PSYCHOLOGY

The student may choose as his first course either Psychology 1, 1a, or 1b. Psychology 1 is open only to sophomores in the College of Arts and Sciences; 1a and 1b are open to sophomores, juniors, and seniors in all colleges.

Students who wish to take courses 1, 1a, 1b, or 2 should go, on one of the registration days, to Morrill Hall, middle entrance, third floor, for assignment to seats and sections.

*1. **Elementary Psychology.** First term. Credit three hours. Professor TITCHENER. Assistant Professor HOISINGTON, Mr. BIXBY, Dr. FELDMAN, Mr. GUILFORD, and Mr. KREEZER. Lectures, T Th 11. Classroom work, S 10 or 11. *Goldwin Smith C.*

Not open to juniors or seniors. For sophomores in the College of Arts and Sciences.

*1a. **Elementary Psychology.** First term. Credit three hours. Assistant Professor DALLENBACH, Dr. FELDMAN, Mr. GUILFORD, and Mr. KREEZER. Lectures, M W 12. Classroom work, F 10, 11, or 12. *Goldwin Smith C.*

Open to sophomores, juniors, and seniors in all colleges.

*1b. **Elementary Psychology.** Second term. Credit three hours. Assistant Professor HOISINGTON, Mr. BIXBY, Dr. FELDMAN, Mr. GUILFORD, and Mr. KREEZER. Lectures, M W 12. Classroom work, F 10, 11, or 12. *Goldwin Smith C.*

Open to sophomores, juniors, and seniors in all colleges.

2. **General Psychology: Problems and Points of View.** Second term. Credit three hours. Prerequisite, Psychology 1 or 1a or 1b. Assistant Professor HOISINGTON, Dr. FELDMAN, Mr. GUILFORD, and Mr. KREEZER. Lectures, T Th 11. Classroom work, S 9, 10, or 11. *Goldwin Smith C.*

3. **Experimental Psychology: Qualitative.** Repeated in second term. Credit three hours. Prerequisite, Psychology 1, 1a, or 1b. Professor WELD, Assistant Professors DALLENBACH and HOISINGTON, Mr. BIXBY, Dr. FELDMAN, Mr. GUILFORD and Mr. KREEZER. M W F 2-4. *Morrill, Psychological Laboratory.*

4. **Experimental Psychology: Quantitative.** Repeated in second term. Credit three hours. Prerequisite, Psychology 1, 1a, or 1b, and 3. Professor WELD, Assistant Professors DALLENBACH and HOISINGTON, Mr. BIXBY, Dr. FELDMAN, Mr. GUILFORD, and Mr. KREEZER. M W F 2-4. *Morrill, Psychological Laboratory.*

[5. **Systematic Psychology: Sensation, Image.** First term. Credit three hours. Not given in 1926-27.]

5a. **Systematic Psychology: Perception, Idea.** First term. Credit three hours. Prerequisite, Psychology 3, or by special permission Psychology 2. Professor WELD and Mr. BIXBY. Lectures M W F 9. *Morrill* 42.

[6. **Systematic Psychology: Feeling, Attention, Action.** Second term, credit three hours. Not given in 1926-27.]

6a. **Systematic Psychology: Memory, Imagination and Thought; Emotion and Volition.** Second term. Credit three hours. Prerequisite, Psychology 3, or by special permission Psychology 2. Assistant Professors DALLENBACH and HOISINGTON and Dr. FELDMAN. Lectures, M W F 9. *Morrill* 42.

7. **Reading of German Psychology.** First term. Credit one hour. Prerequisite, a course in Systematic Psychology. Professor WELD. Day and hour to be arranged. *Morrill 46.*

8. **Reading of French Psychology.** Second term. Credit one hour. Prerequisite, a course in Systematic Psychology. Dr. FELDMAN. Day and hour to be arranged. *Morrill 46.*

9. **Psychological Problems.** Throughout the year. Credit one to five hours. Prerequisite, Psychology 4. Professor WELD, Assistant Professors DALLENBACH and HOISINGTON. Time to be arranged. *Morrill, Psychological Laboratory.*

PUBLIC SPEAKING

*1. **Public Speaking.** Throughout the year. Credit three hours a term. Not open to freshmen. Assistant Professors MUCHMORE and WICHELNS, and Messrs. HANNAH, PARRISH, WOHL, and GILMAN. First term: M W F 8, 9, 10, 11, 12; T Th S 8, 9, 10. Second term: M W F 9, 10, 11, 12; T Th S 10. Rooms to be announced.

Planned to give the fundamentals of speech preparation and to develop simple and direct speaking. Required readings on selected topics.

The '86 Memorial Prize for declamation is awarded in connection with the second term of this course. See the University pamphlet, Prize Competitions.

All students intending to take course 1 must apply at *Goldwin Smith 21* on Friday or Saturday of registration week of each term for assignment to sections.

*1a. **Public Speaking.** Second term. Credit three hours. Not open to freshmen. Assistant Professors MUCHMORE, HUNT, and WICHELNS and Messrs. HANNAH, PARRISH, WOHL and GILMAN. M W F 9, 11, 12, T Th S 8, 9, 10. Rooms to be announced.

This course repeats the work of the first term of course 1.

All students intending to take course 1a must apply at *Goldwin Smith 21* on Friday and Saturday of registration week for assignment to sections.

*8. **Voice Training.** Repeated in second term. Credit one hour. Mr. PARRISH. M W F 10. *Goldwin Smith 26.*

An elementary course for developing flexibility and strength of voice, purity of tone, and accuracy of enunciation and articulation.

10. **Oral Reading.** Repeated in second term. Credit three hours. Not open to freshmen. Assistant Professor MUCHMORE. M W F 9. *Goldwin Smith 26.* Mr. HANNAH. T Th S 11. *Goldwin Smith 21.*

Training in expressive reading based on the interpretative study of prose and poetry. All students intending to take course 10 must apply at *Goldwin Smith 25* on Friday or Saturday of registration week of each term for assignment to sections.

12. **Argument and Debate.** First term. Credit three hours. Prerequisite, Public Speaking 1 or 1a. M W F 11. T Th S 11. Assistant Professor HUNT. *Goldwin Smith 21.*

The application of rules of evidence, types of argument, analysis, detection of fallacies, dialectical method, and parliamentary law to public debate and discussion; practice in debating and drill in delivery.

All students intending to take course 12 must apply at *Goldwin Smith 23* on Friday or Saturday of registration week for assignment to sections.

13. **Argumentative Method.** Second term. Credit three hours. Open by consent of the instructor to upperclassmen. Assistant Professor WICHELNS. M W F 11. *Goldwin Smith 28.*

Public opinion and its formation studied with reference to modern views and applications of rhetorical theory.

14. **American Debate.** Second term. Credit three hours. Open by consent of the instructor to upperclassmen. Assistant Professor HUNT. T Th S 11. *Goldwin Smith 26.*

A study of argumentative method and rhetorical presentation as seen in the debates on the adoption of the Federal Constitution and of the Lincoln-Douglas campaign.

15. **Persuasion and the Forms of Address.** Throughout the year. Credit three hours a term. Prerequisite, Public Speaking 1 and consent of the instructor. Assistant Professor WICHELNS. M W F 12. *Goldwin Smith 26.*

Advanced public speaking; problems of interest, persuasion and rhetorical technique; critical reading of typical masterpieces; composition and delivery of various types of public address.

16. **Classical Rhetoric.** First term. Credit three hours. Open by consent of instructor to upperclassmen and graduates. Assistant Professor HUNT. T Th S 10. *Goldwin Smith 26.*

Rhetorical theory of Plato, Aristotle, Isocrates, Cicero, Quintilian, St. Augustine; its influence upon medieval and modern rhetoric.

17. **British Orators.** Second term. Credit three hours. Prerequisite, Public Speaking 1 and the consent of the instructor. Assistant Professor MUCHMORE. M W F 2. *Goldwin Smith 28.*

A study of selected British orations and addresses.

[18. **History of Rhetoric and Oratory.** First term. Credit three hours. Assistant Professor WICHELNS. Not given in 1926-27.]

20. **Problems and Methods.** First term. Credit two hours. For graduates; open to seniors by permission. Professor DRUMMOND. Day and hour to be arranged.

25. **Phonetics and Speech Training.** Second term. Credit three hours. Prerequisite, Public Speaking 1a (or one term of 1), 8, and the consent of the instructor. Assistant Professor MUCHMORE. Day and hour to be arranged.

For teachers of oral English and public speaking. A study of English phonetics, voice training, pronunciation, principles of oral expression, and of methods in the improvement of normal and of defective speech.

30. **Dramatic Interpretation.** First term. Credit three hours. Open by consent of the instructor to upperclassmen. Professor DRUMMOND. M W F 2. *Goldwin Smith 21.*

Dramatic interpretation, with attention to the principles of stage direction and production.

31. **Play Production.** Second term. Credit one hour. Prerequisite, Public Speaking 30, 10 (or the equivalent), and the consent of the instructor. Professor DRUMMOND. T 2. *Goldwin Smith.*

Theory and practice of dramatic presentation.

40. **Seminary.** Throughout the year. Credit two hours a term. Primarily for graduates. Consult Professor DRUMMOND. Th 4-6. *Goldwin Smith 28.*

For the study of special problems in rhetoric, public address, speech training, and dramatic interpretation.

ROMANCE LANGUAGES

FRENCH

*1. **Elementary Course.** Throughout the year. Credit six hours on completion of the course; upperclassmen, four hours. M W F 12, T Th S 8.

The course is continuous throughout the year and no credit is allowed for the first term alone. Students with first year entrance French should enter the course the second term.

*3. **Advanced Course.** Repeated in second term. Credit six hours; upperclassmen, four hours. Prerequisite, French 1, or second year entrance French. First term: daily 8, 9, 11. Second term: daily 8.

*4a. **Rapid Reading of French.** Repeated in second term. Credit three hours. Prerequisite, French 3, 3a, or third year entrance French. First term: M W F 9, M W F 12, T Th S 11. Second term: M W F 10, M W F 11, T Th S 9.

Translation and outside reading.

Designed primarily for students intending to major in French. May not be taken except in conjunction with 5a.

*4b. **Advanced Translation of French.** Repeated in second term. Credit three hours. Prerequisite, French 4a. First term: T Th S 11. Second term: M W F 8, M W F 9, M W F 10, T Th S 11, T Th S 12.

Translation and outside reading.

*5a. **Elementary Composition.** Repeated in second term. Credit three hours. Prerequisite, French 3, 3a, or third year entrance French. First term, M W F 11, T Th S 9, T Th S 12. Second term: M W F 9, T Th S 10, T Th S 11.

*5b. **Elementary Composition.** Second term. Credit three hours. Prerequisite, French 5a. M W F 11, T Th S 9, T Th S 10. *Goldwin Smith 283.*

*6. **Advanced Translation and Composition.** Throughout the year. Credit six hours on completion of course. Prerequisite, French 3 or third year entrance French. M W F 8, M W F 9, M W F 10, M W F 12, T Th S 10, T Th S 11.

7. **Intermediate Composition.** Throughout the year. Credit three hours a term. Prerequisite, French 5b. Professor PUMPELLY. M W F 10, M W F 12. *Goldwin Smith 277.*

Composition, conversation, and discussion of selected topics in French grammar. Course 7 is conducted in French.

9. **Advanced Composition.** Throughout the year. Credit three hours a term. Prerequisite, French 7. Professor GUERLAC. M W F 10. *Goldwin Smith 283.* Rapid translation from English; themes and talks by students on literary and historical topics. The course is conducted in French.

16. **History of French Literature.** Throughout the year. Credit three hours a term. Prerequisite, French 4b, or French 4a with a grade of A or B. Professor MASON. M W F 11.

Lectures on French Literature since the Middle Ages.

[17. **Literature of the Seventeenth Century.** Throughout the year. Credit three hours a term. Prerequisite, French 16. Professor GUERLAC. Not given in 1926-27.]

18. **Voltaire and His Time.** Throughout the year. Credit three hours. Prerequisite, French 16. Professor GUERLAC. M W F 11. *Goldwin Smith 281.* Lectures, outside reading and reports.

[19. **The Romantic Movement in French Literature.** Throughout the year. Credit three hours a term. Prerequisite, French 16. Professor MASON. Not given in 1926-27.]

[20. **Modern French Literature.** Throughout the year. Credit three hours a term. Prerequisite, French 16. Professor MASON. Not given in 1926-27.]

21. **Contemporary French Literature.** Throughout the year. Credit three hours a term. Prerequisite, French 16. Professor MASON. M W F 9. *Goldwin Smith 290.*

22. **French Phonetics.** Second term. Credit two hours. Professor MASON. M W 8. *Goldwin Smith 281.*

23. **French Philology.** Throughout the year. Credit three hours a term. Prerequisite, French 5a and entrance Latin. Professor PUMPELLY. T 10, Th 2:30-4:30. *Goldwin Smith 277.*

Lectures on the historical development of the French language, with a detailed phonological and morphological study of the *Chanson de Roland*.

[30. **The Teaching of French.** Second term. Credit two hours. Professor MASON. Given in alternate years. Not given in 1926-27.]

[31. **Prose of the Sixteenth Century.** Second term. Credit one hour. Prerequisite, French 16. Professor MASON. Given in alternate years. Not given in 1926-27.]

32. **Poetry of the Sixteenth Century.** Second term. Credit one hour. Prerequisite, French 16. Professor MASON. F 8. *Goldwin Smith 281.*

Open to juniors, seniors, and graduates.

35. **The French Drama in the Nineteenth Century.** First term. Credit two hours. Professor GUERLAC. T Th 11. *Goldwin Smith 283.*

Lectures in French with outside readings and reports.

36. **Lectures in French.** Second term. Credit two hours. Professor GUERLAC. T Th 11. *Goldwin Smith.*

La France d'aujourd'hui; le pays, la nation, les institutions, la vie intellectuelle, sociale, et politique.

47. **Modern French Seminary.** Throughout the year. Credit two hours a term. Professor MASON. T 2:30. *Library, French Seminary.*

Primarily for graduates.

ITALIAN

*1. **Elementary Course.** Throughout the year. Credit six hours on completion of course. Professor PUMPELLY. M W F 9. *Goldwin Smith 283.* The course is continuous throughout the year and no credit will be allowed for the first term alone.

4. **Nineteenth Century Literature.** Throughout the year. Credit three hours a term. Prerequisite, Italian 1, or its equivalent. Professor HAMILTON. T Th 9. *Goldwin Smith 281.*

Novels and criticism of the nineteenth century.

14. **Italian Poetry.** Throughout the year. Credit three hours a term. Prerequisite, Italian 4, or the equivalent. Professor HAMILTON. T Th 11. *Goldwin Smith 281.*

Dante, *Divina Commedia*; Leopardi, *Rime*; Carducci, *Poesie*, will be read in class. Readings and reports for extra-class work.

15. **The Literature of the Italian Renaissance.** Second term. Credit three hours. Prerequisite, Italian 14. Professor HAMILTON. Hours and room to be arranged.

Petrarch, *Rime*; Machiavelli, *Principe*; Ariosto, *Orlando Furioso*. Outside readings and reports.

SPANISH

*1. **Elementary Course.** Throughout the year. Credit six hours on completion of the course; upperclassmen, four hours. M W F 12, T Th S 8.

The course is continuous throughout the year and no credit is allowed for the first term alone. Students entering with one unit in Spanish should take the second term of course 1.

*3. **Advanced Course.** Repeated in second term. Credit six hours; upperclassmen, four hours. Prerequisite, Spanish 1, or second year entrance Spanish. First term: daily 8, 9. Second term: daily 9.

*4a. **Advanced Translation.** Repeated in second term. Credit three hours a term. Prerequisite, Spanish 3, or third year entrance Spanish. First term: M W F 8; T Th S 12. Second term: T Th S 9; T Th S 10.

Translation, outside reading of modern novels and plays. Course 4a may not be taken except in conjunction with 5a. Primarily for students desiring to specialize in Spanish.

*4b. **Advanced Translation.** Repeated in second term. Credit three hours. Prerequisite, Spanish 4a. First term: T Th S 10; Second term: M W F 8.

Translation, outside reading, and discussion of representative works of Spanish literature.

*5a. **Elementary Composition.** Repeated in second term. Credit three hours a term. Prerequisite, Spanish 3, or third year entrance Spanish. Mr. ZAPATA. First term: T Th S 9; T Th S 10. Second term: M W F 9; M W F 10.

*5b. **Elementary Composition.** Second term. Credit three hours a term. Prerequisite, Spanish 5a. Mr. ZAPATA. T Th S 10. *Goldwin Smith 290.*

*6. **Advanced Translation and Composition.** Throughout the year. Credit six hours on completion of the course. Prerequisite, Spanish 3 or third year entrance Spanish. Mr. ROGERS. M W F 11, M W F 12.

7a. **Intermediate Composition.** First term. Credit three hours a term. Prerequisite, Spanish 5b. Mr. ZAPATA. T Th S 12. *Goldwin Smith 277.*

7b. **Intermediate Composition.** Second term. Credit three hours a term. Prerequisite, Spanish 7a. Mr. ZAPATA. T Th S 12. *Goldwin Smith 281.*

Courses 7a and 7b are conducted in Spanish. Special emphasis is placed on the attainment of accuracy and fluency in both written and oral expression.

9. **Contemporary Spanish Life.** Throughout the year. Credit three hours a term. Prerequisite, Spanish 7b. Mr. ZAPATA. M W F 11. *Goldwin Smith 277.* Course 9 is conducted entirely in Spanish.

10. **History of Spanish Literature.** Throughout the year. Credit three hours a term. Prerequisite, Spanish 4a. Professor DALE. M W F 12. *Goldwin Smith 283.*

15. **Drama of the Golden Age.** First term. Credit three hours. Prerequisite, Spanish 4a. Professor DALE. T Th S 11. *Goldwin Smith 277.*

17. **Cervantes.** Second term. Credit three hours. Prerequisite, Spanish 4a. Professor DALE. T Th S 11. *Goldwin Smith 277.*
- [19. **Prose of the Nineteenth Century.** Throughout the year. Credit three hours a term. Prerequisite, Spanish 4a. Professor DALE. Not given in 1926-27.]
20. **Spanish Poetry.** Throughout the year. Credit three hours a term. Prerequisite, Spanish 4a. Professor DALE. T Th S 10. *Goldwin Smith 281.*
- [41. **Old Spanish.** Throughout the year. Credit two hours a term. Professor DALE. Not given in 1925-27.]
Primarily for graduates.
42. **Lope de Vega Seminary.** Throughout the year. Credit two hours a term. Professor DALE. M 2:30. *Library, Spanish Seminary.* Primarily for graduates.

SCANDINAVIAN LANGUAGES AND LITERATURES

1. **Old Icelandic.** Throughout the year. Credit three hours. Professor HERMANNSSON. T Th S, 11. *Library, Greek and Latin Seminary.*
Grammar; reading of sagas, eddic and skaldic poems. For advanced students and graduates.
- [2. **Danish (and Dano-Norwegian).** Throughout the year. Credit two hours a term. Professor HERMANNSSON. Not given in 1926-27.]
3. **Swedish.** Throughout the year. Credit three hours. Professor HERMANNSSON. M W F, 11. *Library, Greek and Latin Seminary.*
Grammar; reading of works by modern Swedish authors.
4. **Norse Mythology.** First term. Credit two hours. Professor HERMANNSSON. T Th, 9. *Library, Greek and Latin Seminary.*
Lectures and readings.
- [5. **Old Norse-Icelandic Literature.** First term. Credit two hours. Professor HERMANNSSON. Not given in 1926-27.]
- [6. **Modern Scandinavian Literatures.** Second term. Credit two hours. Professor HERMANNSSON. Not given in 1926-27.]
7. **Early Scandinavian Civilization and History.** Second term. Credit three hours. Professor HERMANNSSON. T Th 12. *Goldwin Smith 134.*
Lectures on social and political conditions in the Scandinavian countries from the earliest times down to the end of the Middle Ages.

SEMITIC LANGUAGES AND LITERATURES AND ORIENTAL HISTORY

- 1a. **Hebrew.** Throughout the year. Credit three hours. Professor SCHMIDT. M T Th 2. *Goldwin Smith 127.*
Open only to juniors, seniors, and graduates.
- 1b. **Advanced Hebrew.** Throughout the year. Credit two hours. Prerequisite, Semitics 1a. Professor SCHMIDT. T Th 8. *Goldwin Smith 127.*
Proverbs, Canticles, and Esther.
- 2a. **Arabic.** Throughout the year. Credit two hours. Professor SCHMIDT. T Th 9. *Goldwin Smith 127.*
Open to juniors, seniors, and graduates.
- 2b. **Advanced Arabic.** Throughout the year. Credit two hours. Prerequisite, Semitics 2a. Professor SCHMIDT. W F 2. *Goldwin Smith 127.*
Selected suras in the Koran and Prolegomena of Ibn Khaldun.
3. **Ethiopic.** Throughout the year. Credit two hours. Prerequisite, Semitics 1a and 2a. Professor SCHMIDT. T Th 3. *Goldwin Smith 127.*
- 4a. **Assyrian.** Throughout the year. Credit two hours. Prerequisites, Semitics 1a and 2a. Professor SCHMIDT. T Th 4. *Goldwin Smith 127.*
- 4b. **Aramaic.** Throughout the year. Credit two hours. Prerequisite, Semitics 1a. Professor SCHMIDT. T Th 3. *Goldwin Smith 127.*
- 5a. **Egyptian.** Throughout the year. Credit two hours. Prerequisite, Semitics 1a and 2a. Professor SCHMIDT. W 4-6. *Goldwin Smith 127.*
Hieroglyphic texts. Primarily for graduates.

- 5b. **Coptic.** Throughout the year. Credit two hours. Prerequisite, Semitics 5a. Professor SCHMIDT. F 4-6. *Goldwin Smith 127.*
 Selections from the gospels.
6. **Biblical Literature.** Throughout the year. Credit two hours. Professor SCHMIDT. M W 3. *Goldwin Smith 120.*
 General introduction to the Bible. Open to juniors, seniors, and graduates. No knowledge is required of Semitic languages or of Greek.
7. **Semitic Seminary.** Throughout the year. Credit two hours. Prerequisite, Semitics 1a and 4b. Professor SCHMIDT. M 4-6. *Goldwin Smith 120.*
 Carthaginian and Arabic inscriptions. Primarily for graduates.
8. **Comparative Semitic Philology.** Throughout the year. Credit two hours. Professor SCHMIDT. F 3. *Goldwin Smith 127.*
 For graduates only.
- [18. **Oriental History.** Throughout the year. Credit two hours a term. Professor SCHMIDT. A general survey of the history of Asia. Open only to juniors, seniors, and graduates. Not given in 1926-27.]
19. **Oriental History.** Throughout the year. Credit two hours a term. Professor SCHMIDT. A general survey of the history of Africa. Open only to juniors, seniors, and graduates. T Th 10. *Goldwin Smith 256.*

UNIVERSITY REQUIREMENTS FOR THE DEGREES A.B. AND B. CHEM.

HYGIENE AND PREVENTIVE MEDICINE

All undergraduate students are required to present themselves to the Medical Advisers and receive a thorough confidential physical examination once a year. Appointments for this examination must be made during the regular registration days of the first term by all entering students and sophomores. Appointments for this examination must be made during the regular registration days of the second term by all juniors and seniors.

All students in the first two years of undergraduate courses are required to attend lectures on Hygiene and Preventive Medicine given once a week throughout the college year. The first year (Hygiene 1 and 2) is devoted to Personal Hygiene, Mental Hygiene, and First Aid. The second year (Hygiene 3 and 4) is devoted to Sanitation, Disease Prevention, and Group Hygiene.

MILITARY SCIENCE AND TACTICS

1. Practical and Theoretical Training. Throughout the year. Every able-bodied male student (except aliens), a candidate for a baccalaureate degree, who is required to take five, six, seven, eight, or more terms in residence (or the equivalent in scholastic hours), must take in addition to the scholastic requirements for the degree, one, two, three, or four terms respectively in the Department of Military Science and Tactics. Three hours a week, either M T W or Th 2:15-5:15 p. m. *New York State Drill Hall.*

The requirements in Military Science and Tactics must be completed in the first terms of residence; otherwise the student will not be permitted to register again in the University without the consent of the University Faculty.

The course of training is that prescribed by the War Department as basic for Infantry and Field Artillery units (as elected) of Reserve Officers' Training Corps. The Infantry includes instruction in physical training, disciplinary drills, ceremonies, military courtesy, auxiliary weapons (machine guns, automatic rifles, 37 m/m guns, and trench mortars), indoor and outdoor rifle practice, pistol practice, topography and mapping, tent pitching and camp sanitation, signalling, field engineering, field maneuvers, interior guard duty, fundamental principles in minor tactics and leaderships. The Field Artillery includes instruction in organization of the battery, customs of the service, military courtesy and discipline, individual equipment, pistol practice, hippology, gunnery, signalling, physical training, equitation and horsemanship, topography and reconnaissance, and motors.

2. Elective Military Training. Throughout the year. Credit two hours a term. Hours by assignment. *New York State Drill Hall.*

This is the advanced course prescribed by the War Department for units of the Reserve Officers' Training Corps, and includes three hours each week in the performance of the duty of officer or non-commissioned officer with organizations undergoing the training given under course 1, and two hours each week of theoretical instruction in preparation for such duties. Prerequisite course 1.

Course 2 may be elected only by permission of the Dean of the College of Arts and Sciences, and the Professor of Military Science and Tactics, but credit for this course may not be counted toward the ninety hours required in this college (see page 11). To enjoy the benefits offered by the Federal Government the student must agree to continue the course for four terms, and to attend one summer camp having a duration of about six weeks.

PHYSICAL TRAINING FOR MEN

1. For Freshmen Excused from Drill. Throughout the year. Three periods a week. Class and squad work and prescribed exercises. Mr. O'CONNELL and assistants.

2. **For Sophomores Excused from Drill.** Throughout the year. Three periods a week. Class and squad work and prescribed exercises. Mr. O'CONNELL and assistants.
3. **For Juniors and Seniors.** Building up and corrective exercises as prescribed by the Medical Examiners as a result of the physical examination required of all students in the University. Mr. QUINN.
4. **Boxing, Wrestling and Fencing.** Instruction for a small fee at hours to be arranged. Mr. FALLON, Mr. O'CONNELL, and Mr. DARRIELAT.
5. **Swimming.** Instruction, 4-6 p. m. daily except Saturday. Mr. CRAIGIE.

PHYSICAL TRAINING FOR WOMEN

6. **For Freshmen.** Throughout the year. Three periods a week. Miss BATEMAN, Miss READ, Miss RYAN, Miss CANFIELD, and Miss WATERMAN.
7. **For Sophomores.** Throughout the year. Three periods a week. Miss BATEMAN, Miss READ, Miss RYAN, Miss CANFIELD, and Miss WATERMAN.

The work of the two years consists of outdoor games and exercises from the beginning of the year to Thanksgiving, and from Easter vacation to the end of the year. From Thanksgiving to Easter, the work is in large part indoors, and consists of floor exercises, folk, aesthetic, and interpretive dancing, and indoor games, in all of which certain prescribed tests must be met at the end of each period. For further information as to the required work in physical training, see the handbook issued by the Department.

8. **For Juniors and Seniors.** Building up and corrective exercises as prescribed by the Medical Examiners as a result of the physical examination required of all students in the University. Miss WATERMAN.

INDEX

- Accounting, 40.
Agricultural Chemistry, 35.
Analytical Chemistry, 28.
Animal Biology, 19.
Archaeology, 36.
Astronomy, 19.
Bibliography, 19.
Biology, 19.
Botany, 25.
Chemistry, 27.
Classics, The, 36.
Economics, 39.
Education, 43.
English, 44.
Entomology, 20.
Finance, 40.
French, 70.
Geography, 48.
Geology, 48.
German, 51.
Government, 53.
Greek, 36.
Greek Art, 36.
History, 54.
Hygiene, 75.
Industrial Chemistry, 34.
Italian, 72.
Labor and Industrial Relations, 41.
Latin, 37.
Mathematics, 57.
Military Science, 75.
Mineralogy, 49.
Music, 59.
Optical Chemistry, 32.
Organic Chemistry, 30.
Oriental History, 74.
Ornithology, 21.
Paleontology, 50.
Petrography, 49.
Philosophy, 60.
Physical Chemistry, 31.
Physical Education, 62, 79.
Physical Geography, 48.
Physics, 63.
Plant Physiology, 26.
Politics, 53.
Preventive Medicine, 75.
Psychology, 68.
Public Regulation of Industry and Trade, 41.
Public Speaking, 69.
Romance Languages, 70.
Sanitary Chemistry, 33.
Scandinavian Languages, 73.
Semitic Languages, 73.
Social Science, 41.
Spanish, 72.
Statistics, 42.
Zoology, 19.

