# BULLETIN

## 1965-1966

UNDERGRADUATE PROGRAMS

# THE CITY COLLEGE

# COLLEGE OF LIBERAL ARTS AND SCIENCE



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## THE CITY COLLEGE of NY

#### UNDERGRADUATE COLLEGIATE CALENDAR

#### 1965-66

#### **Uptown** Center

1965			
Sept. 8-14	Registration (Day Session).		
Sept. 7-14	Registration (Evening Division).		
Sept. 16	Thursday. Beginning of classes, Fall term (Day and Evening Sessions).		
Sept. 27, 28	No classes.		
Oct. 1	Last day for filing applications for admission to the Spring term.		
Oct. 5	No classes (6pm-11pm only).		
Oct. 6	No classes (Day and Evening).		
Oct. 12	Tuesday. Columbus Day. Classes will be held.		
Oct. 15	Last day for re-examinations, make-up examinations and removal a approved incomplete grades of previous term.		
Nov. 2	Tuesday, Election Day, Classes will be held,		
Nov. 11	Thursday, Veterans' Day, (no classes),		
Nov. 25-27	Thanksgiving recess.		
Dec. 24-Jan. 1	Winter vacation. Dates are inclusive.		

#### 1966

1 (semesters

Jan. 8	Last day of Day Session classes.		
Jan. 11	Last day of Evening classes. (No evening classes will be held o Monday, January 10.)		
Jan. 10-15	Day Session final examinations (given in class).		
Jan. 17-24	Day Session final examinations (group examinations).		
Jan. 13-20	Final examinations (Evening Session).		
Jan. 15	Last day for filing applications for admission to the Fall term.		
Jan. 25-31	Registration (Day Session).		
Jan. 19-31	Registration (Evening Session).		
Feb. 3	Thursday. Beginning of classes, Spring Term (Day and Evenir Sessions).		
Feb. 12	Saturday. Lincoln's Birthday (no classes).		
Feb. 22	Tuesday. Washington's Birthday (no classes).		
Feb. 24	Thursday. All classes (both day and evening) will meet in accordant with Tuesday schedule.		
March 15	Last day for re-examinations, make-up examinations and removal approved incomplete grades of previous term.		

April 4-11 Spring vacation. Dates are inclusive.

April 15	Friday. All Day Session classes will meet in accordance with Monday schedule.		
May 21	Last day of Day Session classes.		
May 23	Last day of Evening classes. (No evening classes will be held Friday, May 20.)		
May 23-28	Day Session final examinations (given in class).		
May 30	Monday. Memorial Day. (no classes).		
May 31-June 7	Day Session final examinations (group examinations).		
May 25-June 3	Final examinations (Evening Session).		
June 15	Wednesday. Commencement.		
June 13-15	Registration (Summer Session).		
June 20	Monday. Beginning of classes, Summer Session.		
July 4	Monday. Independence Day (no classes).		
August 12	Friday. Last day of Summer Session.		

#### NOTES:

- 1. On Thursday, February 24 all classes, both Day and Evening, will follow Tuesday schedules.
- 2. On Friday, April 15 all Day Session classes will follow Monday schedules. Evening classes will follow their regular Friday schedules.
- 3. Please note that this is the undergraduate calendar for the Uptown Center. There are variations in calendars of the Graduate Divisions and also for the Baruch School.

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#### COURSES OF STUDY

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#### BACCALAUREATE CURRICULUM

#### General Description

The College of Liberal Arts and Science offers courses of study leading to the B.A. and B.S. degrees. The B.A. curriculum has four divisions, stressing language and literature, art, music, and social studies, respectively. The courses leading to the Bachelor's degree are divided into the following four groups:

1. A group of common studies prescribed for candidates for all degrees, designed to provide the skills of scholarship and the background of general knowledge essential to a liberal education (approximately 64 credits).

2. Studies forming a background for the particular degree or subdivision, such as mathematics for the natural sciences and history for the social sciences, etc. (12 to 24 credits).

3. Courses in a particular field of specialization (24 credits; for the B.A. in Social Studies, 30 credits).

4. Free electives to stimulate interest in other areas, sufficient in number to complete the 128 credits required for graduation.

#### GROUPS I AND II: BACHELOR OF ARTS

A. The subdivision with specialization in language and literature:

Course title	Credits	See note below
Art 1	1	
Economics 1	3	
English 1, 3, 4	10	(1)
Foreign language		
Latin	6-16	(2)
A second language	8-16	(3)
Health Education 71	2	
History 1, 2	6	
Mathematics 61	4	. (4) .
Music 1	1	
Philosophy 1 or 2 or 3	3	
Physical Education		- SP - Parlet and the Parlet
1, 2, 3, 4, (men) or		
51, 52, 53, 54 (women)	2	
Political Science 1	3	
Science	6-16	(6)
Speech 1, 2	4	(1)

B. The subdivision with specialization in art:

The requirements are the same as in (A) except that Art 10 and Music 20 are prescribed instead of Art 1 and Music 1, and in place of one of the two foreign languages the following courses in art are prescribed:

C. The subdivision with specialization in music: The requirements are as in (A) except that Art 10 and Music 20 are prescribed instead of Art 1 and Music 1, and in place of one of the two foreign languages the following courses are prescribed: Music 3, 4, 9, 13, 14, 16, 30, 26, 27, 28 26 credits

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COURSES OF STUDY

D. The subdivision with specialization in social studies: The same as (A), except that Economics 101 (3 cr.) is prescribed instead of Economics I, and in place of one of the two foreign languages, the following courses are required:

Economics 102	3 credits
History 4 or 5	3 "
Psychology 1	3 "
Sociology 5	3 "

Course title	Credits	See note below
Art 1	the second second	
Biology 3, 4	8	
Chemistry 1, 2 or 3, 4	different son 8 mil 1 militari	(7)
Economics 1	3	
English 1, 3, 4	10	(1)
Foreign language	8-16	(3)
Geology 1	4	The second section of the
Health Education 71	2	
History 1, 2	6	
Mathematics 5, 6 or	8	(5)
7, 8 or	10	(5)
1, 2, 3	10	(5)
Music 1	1	
Philosophy 1 or 2 or 3	3	
Physical Education		
1, 2, 3, 4 (men) or		
51, 52, 53, 54 (women)	2	
Physics 3, 4	8	(7)
Political Science 1	3	
Speech 1, 2	4	(1)

### GROUPS I AND II: BACHELOR OF SCIENCE

#### NOTES:

1. The departments of English and Speech may excuse especially qualified students from the required courses, but such exemptions will not carry credit toward the degree. The departments may also withhold credit and require additional work of students who are below standard.

2. The Latin requirement varies according to the high school preparation. Students who begin Latin in college take 18 credits: Latin 51, 52, 53, and 54 or Comparative Literature 31. If they present two or three years of high school Latin they take 8 credits: Latin 53 and either 54 or Comp. Lit. 31; however, if they are inadequately prepared this requirement may be raised to include Latin 52, for a total of 13 credits. Those who offer four years take six credits: Latin 54 and either an advanced reading course or Comp. Lit 31. In the Evening Division the requirements are similar but not identical; for details see the Bulletin of the School of General Studies.

3. The second foreign language may be French, German, Hebrew, Italian, Russian or Spanish. Students specializing in science may choose any of these, but if they intend to do graduate work they should select French, German or possibly Russian, since many graduate schools require a reading knowledge of at least two of these languages. Students specializing in Art, Music or Social Studies may select any language offered by the college, including Latin or Greek.

The usual requirement is 12 credits, assuming that the student presents two years of language study for admission and decides to continue the language in college. Such students take courses 1 and 2 in the freshman year (in German, 71 and 72), for 6 to 8 credits, depending on the language, followed by more advanced courses in the sophomore year for a total of 12 credits.

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#### MATHEMATICS

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JESSE DOUGLAS B.S., The City College, 1916; Ph.D., Columbia, 1920.

HENRY MALIN

B.S., The City College, 1930; M.S., Massachusetts Institute of Technology, 1932; Ph.D., 1934.

B.A., Kansas, 1931; M.A., 1932; Ph.D., New York University, 1935.

BERNARD VINOGRADE B.S., The City College, 1937; M.A., Michigan, 1940; Ph.D., 1942.

Associate Professors

HOWARD G. BERGMANN B.S., New York University, 1931; M.S., 1933; Ph.D., 1949.

ROBERT CORTELL A.B., Columbia, 1924; A.M., 1931; Ph.D., New York University, 1937.

GERALD FREILICH B.S., The City College, 1946; Sc.M., Brown, 1947; Ph.D., 1949.

EDWIN A. HILL A.B., Columbia, 1930; M.A., 1933.

SOLOMON HURWITZ B.S., The City College, 1927; M.A., Columbia, 1929; Ph.D., 1944.

SELBY L. ROBINSON B.S. Northeast Missourl State Teachers, 1925; M.S., Iowa, 1929; Ph.D., 1931.

FRANK SAIDEL A.B., Unton, 1939; M.A., Michigan State, 1941; Ph.D., Columbia, 1952.

ABRAHAM SCHWARTZ B.S.S., The City College, 1936; M.S., Massachusetts Institute of Technology, 1937; Ph.D., 1939.

FRITZ STEINHARDT A.B., Columbia, 1942; M.A., 1946; Ph.D., 1951.

FRED SUPNICK B.S., Brooklyn, 1937; M.S., 1939.

Assistant Professors

HERMAN J. COHEN B.A., The City College, 1943; M.A., Wisconsin, 1946; Ph.D., 1949.

LEONARD COHEN B.S.S., The City College, 1950; Ph.D., Columbia, 1957.

HERMAN HANISCH B.S., The City College, 1951; Ph.D., New York University, 1956.

ALVIN HAUSNER B.S., Brooklyn, 1951; M.A., Yale, 1952; Ph.D., 1956.

HERBERT H. HINMAN A.B., Columbia, 1929; A.M., 1931.

SONDRA O. JAFFE B.S., Brooklyn, 1957; M.S., New York University, 1960; Ph.D., 1962.

JAMES M. KENNEDY B.S., Villanova, 1922.

JEANETTE F. KESTON B.S., New York University, 1931; Ph.D., Yale, 1935.

RUSSELL D. LOUCKS B.S., Albright, 1928; M.A., Columbia, 1929.

JONAH MANN B.A., Yeshiva, 1954; M.S., 1956; Ph.D., 1964.

MIRIAM B. MAZUR A.B., Hunter, 1930; M.A., 1932; Ph.D., Yale, 1934.

"On leave during the year ending August 1965.

criminal, from institution to enforcement of judgement, are examined in detail, including the jurisdiction, organization and constitution of the several tribunals, administrative as well as judicial. 2 hrs. wk.; 2 cr.

at the Downtown center only. For description of these courses, consult the bulletin of the Baruch School of Business and Public Administration.

For Roman Law, see Latin 61 and 62 (identical with Political Science 61 and 62). For the Philosophy of Law see Philosophy 54.

PROFESSOR ABRAHAM SCHWARTZ

WILLIAM H. FAGERSTROM A.B., M.A., Ph.D.

B.S., M.A., Ph.D.

B.A., M.A., Ph.D.

B.S., M.S., Sc.D.

B.S., Sc.M., Ph.D.

A.B., Rochester, 1929; A.M., 1930; Ph.D., Illinois, 1933. \*GILBERT F. BOEKER

B.A., Columbia, 1925; B.S., 1926; M.E., 1927; Ph.D., 1933.

•On leave during year ending August 1965.

GEORGE N. GARRISON

BENNINGTON P. GILL

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B.A., Ph.D.

SHERBURNE F. BARBER

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The Law Department is a department of the Baruch School of Business and Public Administration. The following courses, may be chosen by students of the College of Liberal Arts and Science and are creditable towards Liberal Arts degrees:

LAW

LAW

11. The American Legal System. This course attempts to acquaint the layman with the machinery by which justice is administered. Typical proceedings, civil and

101. Introduction to Business Law: Contracts. 3 hrs. wk.; 3 cr.

102. The Law of Business Organization. 3 hrs. wk.; 3 cr. Prereq.: Law 101.

The Law of Negotiable Instruments, 2 hrs. wk.; 2 cr. Prereq.: Law 101. 103.

104. The Law of Mercantile Transactions. 3 hrs. wk.; 3 cr. Prereq.: Law 101.

106. The Law of Creditors' Right. 2 hrs. wk.; 2 cr. Prereq.: Law 101.

202. The Law of Real Estate Transactions. 2 hrs. wk.; 2 cr. Prereg.: Law 101.

203. Legal Aspects of Advertising, 2 hrs. wk.: 2 cr.

211. The Law of Labor Relations, 2 hrs. wk.: 2 cr.

Law 11 and Law 101 are offered at both centers; the other courses are offered

#### DEPARTMENT OF MATHEMATICS

Chairman

(to June 30, 1967)

**Professors** Emeriti

WARREN G. HUBERT

PAUL H. LINEHAN

HERBERT P. WIRTH

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ROBERT K. STRANATHAN

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BERNARD SOHMER B.A., New York University, 1949; M.S., 1951; Ph.D., 1958. RICHARD G. STONEHAM B.Sc., Illinois Institute of Technology, 1942; Sc.M., Brown, 1944; Ph.D., Berkeley, 1952. GUY Z. UPDINE A.B., Randolph-Macon, 1920; A.M., Columbia, 1925.

PIERRE R. VANGOETHAM Ing. dipl., University of Brussels, 1952; M.S., Chicago, 1961; Ph.D., New York University, 1964.

Instructors

HIRONORI ONISHI B.S., Allegheny, 1957; M.S., Massachusetts Institute of Technology, 1959; Ph.D., 1961. JEANETTE ROSENSTARK B.S., The City College, 1958; M.S., New York University, 1960; Ph.D., 1963.

Lecturers

DAVID BERKOWITZ A.B., Columbia, 1956. ELLIS BLADE A.B., Stanford, 1932; A.M., Columbia, 1936; Ph.D., 1949. LOUIS J. BRAUN B.A., New York University, 1963. WILLIAM F. BRETT B.S., Columbia, 1959; M.S., 1961. SPERO CRIEZIS B.S., Rensselaer Polytechnic Institute, 1961, M.S., 1964. PETER FALLEY B.S., Columbia, 1960; M.A., 1962. MORRIS GOLDBERG B.A., Yeshiva, 1946; M.S., 1960. ELLEN R. GOTTLIEB B.S., The City College, 1961; M.S., New York University, 1964. ROBERT W. JOHNSON A.B., Columbia, 1962, DEVORA KASACHKOEP B.A., Yeshiva, 1961; M.A., 1963. PAUL S. KIRSHENBAUM B.A., Brooklyn, 1959; M.S., New York University, 1961. EDWARD LEIBSTONE B.S., Chicago, 1959; M.S., 1960. SIDNEY M. LIEBERMAN B.A., Yeshiva, 1957; M.S., New York University, 1958; Ph.D., 1965. ERIC W. LYNN B.S., Vienna Institute of Technology, 1923; Dipl-Ing., 1925. LOUIS LEON MARKIS B.A., Southern Methodist, 1948; M.A., 1949; M.A., Columbia, 1954. GIDEON NETTLER B.S., Rensselaer Polytechnic Institute, 1961. SIDNEY NEUMAN B.S., The City College, 1926; A.M., Columbia, 1927. FREDERIC M. POLLACK B.S., The City College, 1964. JEROME ELLIOT SACKS B.A., Brandels, 1961; M.A., Columbia, 1962. MARVIN SCHWARTZ B.S., Chicago, 1958; B.A., 1958; M.S., New York University, 1963.

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MICHAEL I. SENTLOWITZ B.A., Duke, 1957. EDNA SHEINHART A.B., Hunter, 1944; M.A., Columbia, 1950.

STEVEN SHRIER B.S., Columbia, 1964.

ISAAC STEGMAN B.A., The City College, 1957; M.S., New York University, 1964. RICHARD VAGGE B.B.A., The City College, 1943; M.B.A., 1963.

#### REQUIREMENTS

The statement of specific courses in Mathematics required for the several degrees is the college of Liberal Arts and Science is given on page 17 and is repeated here. For the B.A. degree Mathematics 61 is required. Students who wish to take more advanced work in place of Mathematics 61 may take Mathematics 5 and 6 or Mathematics 1 or Mathematics 7. For the B.S. degree with emphasis on biology or psychology Mathematics 5 and 6 are required. Students who wish to take more advanced work in alace of these courses may take Mathematics 1 and 2 or Mathematics 7 and 8. For the B.S. degree with emphasis on chemistry, geology, mathematics, or physics Mathematics 1. 2, and 3 or Mathematics 7 and 8 are required.

Mathematics 91 and Mathematics 92 are required courses in the School of Engineering and Architecture. They may be elected by students in Meteorology (Geology Dept.); and, if approved by the elective concentration adviser, by students in other science areas. Only with prior approval of the department of Mathematics may they be used for elective concentration in mathematics. Credit will not be given for both Math. 92 and Math. 114.

#### INTRODUCTORY COURSES

1, 2, 3. Analytic Geometry and Calculus, I, II, III. This sequence of three courses covers the same ground as Mathematics 7 and 8 and, in addition, provides time for some review, as needed, of algebra and trigonometry. It is required in place of Mathematics 7 and 8 of students who have taken both trigonometry and advanced algebra in high school if, after examination, they are considered to need some review of these subjects.

Three terms. Math. 1, 4 hrs. wk.; 3 cr. prereq.: same as for Math 7; Math. 2, 4 hrs. wk.; 3 cr. prereq.: Math. 3, 4 hrs. wk.; 4 cr. prereq.: Math. 2.

5. Elementary Mathematical Analysis I. The rectangular coordinate system, plane trigonometry, the straight line, the conic sections, limits and continuity. 4 hrs. wk.; 4 cr. Prereq.: 21/4 units of high school mathematics including plane geometry and intermediate algebra.

6. Elementary Mathematical Analysis II. Polynomials and the theory of equations; the derivative and applications to graph sketching, motion problems, extrema problems; definite integral, indefinite integral, fundamental theorem of the integral calculus and applications to areas, volumes, and motion problems; the transcendental functions and their calculus. 4 hrs. wk.; 4 cr. prereq .: Math. 5.

7. Analytic Geometry and Calculus. 5 hrs. wk.; 5 cr. Prereq.: Trig. and Adv. Alg., either in high school or in college.

8. Calculus. 5 hrs. wk.; 5 cr. Prereq.: Math. 7.

9. Elementary Mathematical Analysis III. 4 hrs. wk.; 4 cr. Prereq.: Math. 6.

42. Plane Trigonometry. 3 hrs. wk.; 3 cr.

43. College Algebra. 3 hrs. wk.; 3 cr.

53. Intermediate Algebra. Prescribed for students who do not present Intermediate Algebra for admission. 3 hrs. wk.; no cr.

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61. Fundamentals of Mathematics I. An introduction to some of the methods at calculus. For students not intending to specialize in science or mathematics. 4 ha wk.; 4 cr. Prereq.: 3 units of high school mathematics including plane geometry and intermediate algebra.

62. Fundamentals of Mathematics II. 3 hrs. wk.; 3 cr. Prereq.: Math. 61.

63. Elementary Mathematical Statistics. Probability, frequency, dispersion, means correlation, sampling, and relation topics. 3 hrs. wk.; 3 cr. Prereq.: Math. 61.

216. Arithmetic Analysis. Arithmetic theory and practice with approximately one third of the course devoted to applications to typical business problems. 3 hrs. with 3 cr. in the School of Education; no cr. in the College of Liberal Arts and Science.

#### ELECTIVE COURSES

Students desiring to take electives should consult the departmental Elective Concentration advisor. Continued privilege of electives is dependent upon attaining a minimum final grade of "C" in each prerequisite course taken.

A Mathematics major is advised to select one of French, German, or Russian as his required language and to acquire a reading knowledge of two of these languages if he inetnds to do graduate work in Mathematics.

11. Theory of Numbers. 3 hr. wk.; 3 cr. Prereq.: Math. 3 or 8.

12. History of Mathematics. 3 hrs. wk.; 3 cr. Prereq .: Completion of prescribed Math.

13, 14. Introduction to Higher Analysis I, II. Suggested for students who intend to do graduate work at the doctoral level in mathematics. Two terms, 4 hrs. wk; 4 credits each term. Math. 3 or Math. 8 is prereq. for Math. 13; Math. 13 is prereq. for Math. 14. Credit will not be allowed for both Math. 13, 14 and Math. 23, 24, 25.

15. Ordinary Differential Equations. 3 hrs. wk.; 3 cr. Prercq.: Math. 14 or 25.

17. Differential Geometry. 3 hrs. wk.; 3 cr. Prereq.: Math. 14 or 25.

18. Calculus of Variations. 3 hrs. wk.; 3 cr. Prereq.: Math. 14 or 25 and 91 or 15.

19. Actuarial Mathematics I. 3 hrs. wk.; 3 cr. Prereq.: Two elective courses in Mathematics.

21. Mathematical Statistics I. Students who have completed Mathematics 218 in the School of Business may not receive credit for Mathematics 21. 3 hr. wk.; 3 cr. Prereq: Math. 3 or 8.

22. Mathematical Statistics, II. 3 hrs. wk.; 3 cr. Prereq.: Math. 21.

23. Advanced Calculus I. The real number system, continuous functions, functions of several variables, theorems of partial differentiation. 3 hrs. wk.; 3 cr. Prereq.: Math. 3 or 8. The Mathematics 23, 24, 25 sequence is suggested for students who do not intend to do graduate work at the doctoral level in mathematics. Credit will not be allowed for both Math. 13, 14 and Math. 23, 24, 25.

24. Advanced Calculus II. Implicit-function theorems, transformations and mappings, vectors and vector fields, surface theory, surface integrals, point set theory. 3 hrs. wk; 3 cr. Prereq.: Math. 23.

25. Advanced Calculus III. Theory of integration, infinite series, uniform convergence, improper integrals, Fourier series. 3 hrs. wk.; 3 cr. Prereq.: Math. 24.

26. Vector Spaces and Matrices. 3 hrs. wk.; 3 cr. Prereq.: Math. 3 or 8.

28. Numerical Analysis. Solution of equations by iteration techniques, interpolation and approximation, numerical differentiation, numerical integration, the solution of differential equations. 3 hrs. wk.; 3 cr. Prereq.; Math. 13 or 91.

31. Introduction to Modern Geomerty, 3 hrs. wk.; 3 cr. Prereq.: Math. 26.

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32. Theory of Functions of a Complex Variable. 3 hrs. wk.; 3 cr. Prereq.: Math. 14 or 25.

33. Introduction to Modern Algebra. 3 hrs. wk.; 3 cr. Prereq.: Math. 11.

34. Theory of Functions of Real Variables. 3 hrs. wk.; 3 cr. Prereq.: Math. 14 or 25.

35. Partial Differential Equations, Integral Equations, Boundary Value Problems. 3 hrs. wk.; 3 cr. Prereq.: Math. 14 or 25 and 15 or 91.

37. Topology. A course in general topology. Sets of points on the real line and in general abstract spaces. Relations between sets of points, between a set and the space containing it. Operations with sets, open sets, countability, compactness, connectedness, mappings, continuity, metric spaces, general topological spaces. 3 hrs. wk.; 3 cr. Prereq.: Math. 14 or 25.

91. Mathematics for Engineers I. Ordinary differential equations of the first order, linear differential equations, series solution of differential equations, uniform convergince, functions defined by integrals. 3 hrs. wk.; 3 cr. Prereq.: Math. 3 or 8.

92. Mathematics for Engineers II. Linear algebra, vector spaces, vector field theory, theorems of Green and Stokes. 3 hrs. wk.; 3 cr. Prereq.: Math. 91.

33. Mathematics for Engineers, III. Probability theory. 3 hrs. wk.; 3 cr. Prereq.:

Math. 92. 113. Topics in Advanced Calculus for Students of Applied Science, Part I. Vectors, vector differential calculus; differential calculus of functions of several variables; integral calculus of functions of several variables. 3 hrs. wk.; 3 cr. Prereq.: Math. 91.

114. Topics in Advanced Calculus for Students of Applied Science, Part II. Vector integral calculus; infinite series; introduction to functions of a complex variable. 3 hrs. wk; 3 cr. Prereq.: Math. 113.

#### ORGANIZATIONS

The Mathematics Society is the undergraduate mathematics organization. It meets regularly to listen to lectures by students, faculty members, and guests from other institutions. Occasionally a student journal is published.

#### METEOROLOGY

See Geology.

## DEPARTMENT OF MILITARY SCIENCE AND TACTICS

Chairman

Lieutenant Colonel PIERREPONT F. BARTOW

Lieutenant Colonel

PIERREPONT F. BARTOW B.S., The Citadel, 1947.

Major

WILBUR C. BUCKHEIT B.S., United States Military Academy, 1954; M.S., Illinois, 1960.

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