## BULLETIN 1965-1906

UNDERGRADUATE PROGRAMS

## THE

## COLLEGE OF LIBERAL ARTS AND SCIENCE



THE CITY UNIVERSITY OF NEW YORK

## THE CITY COLLEGE of $N y$

## UNDERGRADUATE COLLEGIATE CALENDAR 1965-66

## Uptown Center

## 1965

Sept. 8-14
Sept. 7-14
Sept. 16
Sept. 27, 28
Oct. 1
Oct. 5
Oct. 6
Oct. 12
Oct. 15
Nov. 2
Nov. 11
Nov. 25-27
Dec. 24-Jan. 1
Registration (Day Session).
Registration (Evening Division).
Thursday, Beginning of classes, Fall term (Day and Evenim Sessions).

## No classes.

Last day for fling applications for admission to the Spring term No classes ( $6 \mathrm{pm}-11 \mathrm{pm}$ only).
No classes (Day and Evening).
Tuesday. Columbus Day. Classes will be held.
Last day for re-examinations, make-up examinations and removal a approved incomplete grades of previous term.
Tuesday. Election Day. Classes will be held.
Thursday. Veterans' Day, (no classes).

1966
Jan. 8 Last day of Day Session classes.
Jan. 11 Last day of Evening classes. (No evening classes will be held a Monday, January 10.)
Jan. 10-15
Jan. 17-24
Ian, 13-20
Jan. 15
Jan. 25-31
Jan. 19-31
Feb. 3
Feb. 12
Feb. 22
Feb. 24

April 4-11

March 15 Last day for re-examinations, make-up examinations and removal d approved incomplete grades of previous term.
Day Session final examinations (given in class).
Day Session final examinations (group examinations).
Final examinations (Evening Session).
Last day for filing applications for admission to the Fall term. Registration (Day Session).
Registration (Evening Session).
Thursday, Beginning of classes, Spring Term (Day and Evenin!
Sessions). Sessions).
Saturday, Lincoln's Birthday (no classes).
Tuesday. Washington's Birthday (no classes).
Thursday. All classes (both day and evening) will meet in accordanz with Tuesday schedule.
approved incomplete grades of
Spring vacation. Dates are inclusive.

## April 15

May 21
May 23
May 23-28
May 30
May 31-June 7
May 25-June 3
June 15
June 13-15
June 20
July 4
August 12

Friday. All Day Session classes will meet in accordance with Monday schedule.
Last day of Day Session classes.
Last day of Evening classes. (No evening classes will be held Friday, May 20.)
Day Session final examinations (given in class).
Monday. Memorial Day. (no classes).
Day Session final examinations (group examinations).
Final examinations (Evening Session).
Wednesday. Commencement.
Registration (Summer Session).
Monday. Beginning of classes, Summer Session.
Monday. Independence Day (no classes).
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.

# City coll N.Y. 

## 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

Economics 1
English 1, 3, 4
Foreign language

## Latin

A second language
Health Education 71
History 1, 2
Mathematics 61
Music 1
Philosophy 1 or 2 or 3
Physical Education
1,2,3,4, (men) or $51,52,53,54$ (women)
Political Science 1
Science
Speech 1, 2

1 3 10

6-16
8-16
2
6
4
1
3

2
3
6-16
4
(6)
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:

Art $11.1,12.1,14.1,15.1$ or $18,16.1$ or 19 , $21,22,24,25.1,25.2,31.1,32.1$ 24 credits.
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 $\qquad$ 26 credits. (see note 8)
D. The subdivision with specialization in social studies: The same as (A), except that Economics 101 ( 3 cr .) is prescribed instead of Economics 1, 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 |

GROUPS I AND II: BACHELOR OF SCIENCE

Course title
Art 1
Biology 3, 4
Chemistry 1,2 or 3, 4
Economics 1
English 1, 3, 4
Foreign language
Geology 1
Health Education 71
History 1, 2
Mathematics 5, 6 or
7, 8 or
1, 2, 3
Music 1
Philosophy 1 or 2 or 3
Physical Education
$1,2,3,4$ (men) or
$51,52,53,54$ (women) 2
Physics 3, 4 8
Political Science 1 3
Speech 1, 2

Credits
1
8
8
3
10
8-16
4
2
6
6
8
10
10
1
3
3
2
8
3
4

See note below

NOTES:

1. The departments of English and Speech may excuse especially qualified student 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 yean 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.

## LAW

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:
11. The American Legal System. This course attempts to acquaint the laynan with the machinery by which justice is administered. Typical proceedings civif an criminal, from institution to enforcement of judgement, are examined in detail, incles ing the jurisdiction, organization and constitution of the several tribunals, administratio as well as judicial. 2 hrs. wk.; 2 cr.
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.
103. The Law of Negotiable Instruments, 2 hrs. wk; 2 cr. Prereq.: Law 101.
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. Prereq: 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 offerd at the Downtown center only. For description of these courses, consult the bulkein of the Baruch School of Business and Public Administration.

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

## DEPARTMENT OF MATHEMATICS

## Chairman

## Professor Abraham Schwartz

(to June 30, 1967

## Professors Emierit

## Willlam H. Fagerstrom <br> B., M.A., Ph.D.

Gzorge N. Garrisol
B.S., M.A, Ph.D.
Benninoton P. Gili
B.A., M.A. Ph.D.

Warren G. Hubert
B.S., M.S., Sc.D.

Paul. H. Linehan
B.A., Ph.D.

Herbert P. Wirth
B.S., Sc.M., Phid.

## Professors

Sherburne F. Barber
herburne F. Barber
A.B., Rochester, 1929; A.M., 1930; Ph.D., Ilinois, 1933.
Gilbert F. Boekiza
B.A., Columbia, 1925; B.S., 1925; M.E., 1927; Ph.D., 1933.

## *On leave during year ending August 1965

IESE DoUcLas The City College, 1916; Ph.D., Columbta, 1920.
Henay Malin
Hexsy MatiN
B.S., The City College, 1930; M.S., Massachusets Institute of Techoology, 1932; Ph.D., 1934.
Robfrt K. Stranituan
BA. Kansas, 1931; M.A., 1932; Ph.D., New York University, 1935.
berkikd Vinogride
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.

## Rorert Cortell.

AB. Columbia, 1924; A.M., 1931; Ph.D., New York University, 1937.
Ofritd Freilich
BS., The City Colleye, 1946; Sc.M. Brown, 1947; Ph.D., 1949.
Eown A. Hinx
RiB, Columbia, 1930; M.A., 1933.
Sotamion Huswitz
Soromon Hurwrtz
BS. The City College, 1927; M.A., Columbia, 1929; Ph.D., 1944.
Sziny L, Roninson
B.S. Northeast Missourt State Teachers, 1925; M.S., Iowa, 1929; Ph.D. 1931.

Fruyk Stidel
Frikr, Unton, 1939; M.A., Michigan State, 1941; Ph.D., Columbla, 1952.
Amruим Schwartz
R.S.S., The Chy Coliege, 1936; M.S, Massachusetts Institute of Technology, 1937; Ph.D. 1939. Farrz Stewnampt
AB. Columbla, 1942; M.A., 1946; Ph.D., 1951.
Frip Supnick
BS. Brooklyn, 1937; M.S., 1939.

Assistant Professors
Herviny. Comen
B.A. The City Collese, 1943; M.A., Wisconsin, 1946; Ph.D., 1949. Lennird Comen
BRSS, The City College, 1950; Ph.D., Columbia, 1957.
Hibman Humisctit
B.S., The City College, 1951; M.D., New York University, 1956.

Azvin Hausner
B.S. Brookhr, 1951; M.A., Yake, 1952; Ph.D. 1956.

Hizeert H. Hinman
नizeert Columbta, 1929; AM., 1931.
Sompra O. Jaffi
(1957; M.S. New York University, 1960; PhD., 1962.
Jimes M. Kennedy
BS, Vilanora, 1922.
Ifixiztie F. Keston
BS. New York Unlversity. 1931; Ph.D., Yale, 1935.
Ruseen! D. Loucks
ES., Albrisht, 1928; M.A., Cohmbia, 1929.
Jovir MinN
B.A. Yesthiva, 1954; M.S., 1956; Ph.D., 1964.
Mrimin B. Mizur
AB., Hunter, 1930; M.A., 1932; Ph D., Yale, 1934.

On taive during the year cending August 1965.

## city roll $1965-66$ <br> MATHEMATICS

90
Bernard Sohmer
B.A., New York University, 1949; M.S., 1951; PhD., 1958

Richard G. Stoneham
B.Sc., illinois Institute of Technology, 1942; Sc.M., Brown, 1944; Ph.D., Berkeley, 1992 Guy Z. Urine
Pierre R viph-Macon, 1920; A.M., Columbia, 1925
IIERE R, vanGoethinm
e. All., University of Brussels, 1952; M.S., Chicago, 1961; Ph.D., New York Ualventy, whf

## Instructors

Gironori Onisht
B.S., Allegheny, 1957

Musts Institute of Technology, 1959; Ph.D. 1951 B.S, The City College,
avid Berkowitz
A.B., Columbia, 1956

Ellis Blade
A.B., Stanford, 1932; A.M., Columbia, 1936; PhD., 1949.
burs J. Braun
B.A., New York University, 1963

WHLLAM F. Brett
MSS., 1961
B.S., Rensselact

Polytechnic Institute, 1961, M.S., 1964.
Peter Foley
M.A., 1962.

ORRIS Goldberg
Elite $R$ Gotpuibe
B.S., The City College

Robert W. Jounce, 1961; M.S. New York University, 1964
Robert W. Johnson
Devora Kasachiroer
B.A., Yeshiva, 1951; M.A., 1963

Paul S. Kikitenbadim
B.A., Brooklyn, 1959; M.S., New York University, 1961.

EDWard Leibstone
B.S., Chicago, 1959; M.S., 1960.
$\underset{\text { Bidet M. Yeshiva, }}{\substack{\text { Lisp man } \\ \text { B. }}}$
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 Maris
B.A., Southern Methodist, 1948; M.A., 1949; M.A, Columbia, 1994

Gideon Nettles
B.S., Rensselaer Polytechnic Institute, 1961

Sidney Neumin
B.S., The City College, 1926; A.M, Columbia, 1927

Frederic M. Pollack
Frederic M. PoLlack
B.S. The City College, 1964
Jerome Eliot Sucks
D.A., Brandels, 1961: M.A, Columbia, 1962

Marvin Schivartz
B.S., Chicago, 1958; B.A., 1958; M.S., New York University, 1963.

## Mesabi I. Sentlowitz <br> 2A. Duke, 1957. <br> Rsi, Sfenniart <br> Siva Shier <br> Bis., Columbia, 1964 <br> buy Smoking <br> B.A. The City College, 1957; M.S.. New York University, 1964. <br> Racruso Vice <br> RBA, the City College, 1943; M.R.A., 1963.

## REQUIREMENTS

The statement of specific courses in Mathematics required for the several degrees ia the college of Liberal Arts and Science is given on page 17 and is repeated here advanced work in place of Mathematics 61 may the Mathematics 5 to take more metics 1 or Mathematics 7. For the B.S. degree with emphasis on biology or psychology Yathernaties 5 and 6 are required. Students who wish to take more advanced work in place of these courses may take Mathematics 1 and 2 or Mathematics 7 and 8. For the 8S. 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, 1, 11, III. This sequence of three course 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 o Mathematics 7 and 8 of students who have taken both trigonometry and advance after examination, they are considered to need some review

Three terms
Three terms. Math, 1, 4 hrs. wk.: 3 cr. prereq.: same as for Math 7; Math, 2, 4 us. wk; 3 cr. prereq.: Math. 3, 4 hrs. wk.; 4 cr. prereq.: Math. 2
3. Elementary Mathematical Analysis 1. The rectangular coordinate system, plane reononetry, the straight line, the conic sections, limits and continuity, 4 hrs. wk; 4 cr Prereq: $21 /$ units of high school mathematics including plane geometry and intermedisio algebra.
6. FRementary 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 .
2. 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

## City Coll. N.Y. 1965-66

61. Fundamentats of Mathematics 1. An introduction to some of the methods a calculus. For students not intending to specialize in science or mathematics. 4 hn wk; 4 cr . Prereq.: 3 units of high school mathematics including plane geometry in termediate algebra.

## 62. Fundamentals of Mathematies II, 3 hrs. wk: 3 cr. Prereq.: Math. 61.

63. Elementary Mathematical Statistics. Probability, frequency, dispersion, mea correlation, sampling, and relation topics. 3 hrs. wk.; 3 cr. Prereq.: Math. 61
64. Arithmetic Analysis. Arithmetic theory and practice with approximately one third of the course devoted to applications to typical business problems. 3 hrs wt 3 cr . in the School of Education; no cr. in the College of Liberal Arts and Sciese:

## ELECTIVE COURSES

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

A Mathematics major is advised to select one of French, German, or Russian 8 his required language and to acquire a reading knowledge of two of these languages in 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 credis 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. Prereq.: Math. 14 or 25.
17. Differential Ceometry. 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 Mathenatics I. 3 lirs. wk: 3 cr. Prereq. Two elective courses in Mathematics.
21. Mathematical Statistics 1. Students who have completed Mathecatics 218 in th 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 1. The real number system, continuous functions, functions of several variables, theorems of partial differentiation, 3 hrs. wk.; 3 cr. Prereq.: Math. or 8 . The Mathematics $23,24,25$ sequence is suggested for students who do mo ntend 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 wh; 3 cr. Prereq.: Math. 23.
25. Advanced Calculas 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 ifferential equations. 3 hrs. wk.; 3 cr. Prereq.: Math. 13 or 91.
31. Introduction to Modern Geomerty. 3 hrs. wk.; 3 cr. Prereq.: Math. 26.
32. Tweory of Functions of a Complex Variable. 3 brs. wk;; 3 cr. Prereq.: Math. 14 or 25 .
33. Introduction to Modera 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. Putial Difterential Equations. Integral Equations,
3

3 hrs wi.; 3 cr . Prereq:: Maik. 14 or 25 and 15 or 91. . 37. Topology. A course in general topology. Sets of points on the real and the space general abstrict spaces. Relations between sets or poikije compactness, connectedness, conaining it. Operations with sets, open sest, pological spaces. 3 hrs. wk.; 3 cr. Prereq:mappings, continu
Mati. 14 or 25 .
91. Wathematics for Engineers 1. Ordinary differential equations of the first order, 91. Mathematics for Enginecrs 1. Ordiary difcrenerial equations, uniform converglinear diferential equations, series soluhion of def.; 3 cr. Prereq.: Math. 3 or 8.
. theorerns of Green and Stokes. 3 hrs. wk.; 3 cr. Prereq.: Math. 91.
93. Mathematics for Engineers, III. Probability theory, 3 hrs. wk.; 3 cr. Prereq.: Math. 92.
113. Topies in Advanced Calculus for Stadents of Applied Science, Part 1. Vectors, 13. Iopies fitegral calculus of functions of several variables. 3 hrs wk; 3 cr. Prereq.: Math. 91 14. Tonies in Advanced Calculus for Students of Applied Science, Part 11. Vector 14. Topies in Advanite series; introduction to functions of a complex variable. 3 hrs wh; 3 er. Prereq.: Math. 113.

## ORGANIZATIONS

The Mathenatics Society is the undergraduate mathematics organization. It meets regularly to listen to lectures by students, faculty me fintitutions. Oceasionally a student journal is published

METEOROLOGY

## See Geology.

## DEPARTMENT OF MILITARY SCIENCE AND TACTICS

## Chairman

Leutenant Colonel Frerrefont F. Bakrow

Lieutenant Colonel

Pexampont F, Bintow
BS, The Citadel, 1947.
Major
Whbun C. Bucrumerr
B.S, Uniled States Mitary Academy, 1954; M 9., Ilinois, 1960.

