Ital 478-479 Readings and Research I, II
Especially recommended to Seniors. Independent study and frequent consultations with a departmental adviser on a fairly broad aspect of Italian literature of special interest to the student.
Prerequisite: Departmental permission.
Hrs by Arrangement 3 Credits
Staff

Ital 480 Letteratura Dialettale Italiana
The impact of dialect poetry in Italian literature particularly in the Romantic Period, in relation to the questione della lingua.
Prerequisite: Italian 311 or equivalent and departmental permission.
3 Lect Hrs 3 Credits
Mr. Giustiniani

Ital 498-499 Honors Thesis in Italian I, II
Independent and original investigation of a specific aspect of Italian literature of special interest to the student, under the supervision of a departmental adviser.
Prerequisite: Departmental permission.
Hrs by Arrangement 3 Credits
Staff

Ital 586 Methods and Practice Teaching of Italian in Secondary Schools
The issues, principles and methods of secondary school Italian language teaching. Supervision and critique of practice teaching.
Prerequisite: 6 hours education courses and admission to Teacher Certification Program.
3 Lect Hrs, 20 Hrs practice teaching 9 Credits
Mr. Carrara

LATIN

Latin 111-112 Elementary Latin
For students who have no creditable training in latin. Intensive practice in language skills with introductory readings.
3 Lect Hrs 4 Credits
Staff

Latin 211-212 Intermediate Latin
Review of reading skills, selective readings in Latin literature.
Prerequisite: Latin 112 or equivalent.
3 Lect Hrs 4 Credits
Staff

Latin 311-312 Latin Composition
Composition, review of Latin syntax and structure, translations from English and original compositions.
Prerequisite: Latin 212 or equivalent.
3 Credits
Staff

Latin 331 Latin Literature and Virgil
Intensive study of the epic poetry of Virgil.
Prerequisite: Latin 212 or equivalent.
3 Lect Hrs 3 Credits
Staff

Latin 332 Latin literature Elegiac Poetry
Intensive study of Catullus and the Elegiacs.
Prerequisite: Latin 212 or equivalent.
3 Lect Hrs 3 Credits
Staff

Latin 333 Latin Literature — Ovid
Intensive study of Ovid's *Metamorphoses.*
3 Lect Hrs 3 Credits
Staff

Latin 334 Latin Literature — Tacitus
Intensive study of the *Annals* by Tacitus.
Prerequisite: Latin 212 or equivalent.
3 Lect Hrs 3 Credits
Staff

Latin 335 Latin Literature — Lucretius
Intensive study of Lucretius' *De Rerum Natura.*
Prerequisite: Latin 212 or equivalent.
3 Lect Hrs 3 Credits
Staff

Latin 336 Latin Literature — Cicero
Intensive study of Cicero's *The Philosophical Work.*
Prerequisite: Latin 212 or equivalent.
3 Lect Hrs 3 Credits
Staff

Latin 337 Latin Literature — Roman Theatre
Readings in the Roman Theatre, including works by Plautus, Terence and Seneca.
Prerequisite: Latin 212 or equivalent.
3 Lect Hrs 3 Credits
Staff

Latin 338 Latin Literature — Horace
Horace's odes and satires.
Prerequisite: Latin 212 or equivalent.
3 Lect Hrs 3 Credits
Staff

Latin 339 Latin Literature — Roman Satire
Reading of selected satires of Juvenal, epigrams of Martial together with an analysis of Cena Trimalchionis, Ludus de Morte Claudii and selected inscriptions.
Prerequisite: Latin 212 or equivalent.
3 Lect Hrs 3 Credits
Ms. Tobin

MATHEMATICS

COLLEGE I

Alfonso Azpeitia, Ph.D., Professor of Mathematics and Chairman; Herbert Kamowitz, Ph.D., Professor of Mathematics; Robert Seeley, Ph.D., Professor of Mathematics; James S. Byrnes, Ph.D., Associate Professor of Mathematics; Guy Hogan, Ph.D., Associate Professor of Mathematics; John A. Lutts, Ph.D., Associate Professor of Mathematics; Some Nath Mukherjee, Ph.D., Associate Professor of Mathematics; Elizabeth O'Neill, Ph.D., Associate Professor of Mathematics; Dean Bandes, Ph.D. Assistant Professor; Carl Cohen, M.A., Assistant Professor of Mathematics; Daniel Comenetz, Ph.D. Assistant Professor of Mathematics; So-Fei Fang, Ph.D. Assistant Professor of Mathematics; Joan Lukas, Ph.D. Assistant Professor of Mathematics; Sherwood Washburn, Ph.D. Assistant Professor of Mathematics; Joseph F. Russell, M.A., Part-time Lecturer in Mathematics.

COLLEGE II

Taffee T. Tanimoto, Ph.D., Professor of Mathematics and Chairman; Ethan Bolker, Ph.D., Professor of Mathematics; Matthew Gaffney, Ph.D., Professor of Mathematics; Geza Schay, Jr., Ph.D., Professor of Mathematics; Bernice Auslander, Ph.D., Associate Professor of Mathematics; Ernest S. Elyash, Ph.D., Associate Professor of Mathematics; Stephen K. Parrott, Ph.D., Associate Professor of Mathematics; Colin Godfrey, Ph.D., Assistant Professor of Mathematics; Helen Skala-Kowalski, Ph.D., Assistant Professor of Mathematics; Michael B. Tomlinson, Ph.D., Assistant Professor of Mathematics; James N. Whitney, Ph.D., Assistant Professor of Mathematics; Dennis H. Wortman, Ph.D., Assistant Professor of Mathematics; Marc Levine, M.A., Instructor in Mathematics; Victor Miller, M.A., Instructor in Mathematics; Anthony Marcinkiewicz, M.A., Part-time Lecturer in Mathematics; Robert Reitano, M.A., Part-time Lecturer in Mathematics.

COURSES PRIMARILY FOR NON-MAJORS

Math 100 through Math 137 are courses primarily for non-majors. The goals of these courses vary substantially and the student should therefore consult with his advisor or the Mathematics Department(s) before deciding which of them to take. The calculus sequence,

Math 140, 141, (150) and 240 will also interest many non-majors. Note that Math 100 and 105 are designed for — and limited to — those students who found high school mathematics a severe stumbling block.

DIAGNOSTIC TEST*

Note that any student who wishes to register for any course from Math 100 through to Math 140 inclusive is required to take the departmental diagnostic test and be advised on the basis of his or her score prior to registering for that course.

GRADUATION REQUIREMENTS FOR MATHEMATICS MAJORS*

All mathematics majors are required to take Math 140, 141, 150 and 240 or their equivalents; Math 255 or Math 258; Math 350, Math 360 and six other courses above Math 258; Physics 113 (lab optional).

**Note:* Those policies above marked with an * are current ones. They will probably be changed somewhat before the Fall, 1974, Semester begins. Consult with the Mathematics Department(s) for any possible changes.

COURSE OFFERINGS

The prerequisite for all introductory level courses, unless otherwise stated is: two years of algebra and one year of plane geometry at the high school level. NOTE: Some courses are under consideration for revision; thus what is contained below represents current departmental offerings (as of January 23, 1974); please consult the Mathematics Department (s) for any possible changes.

GRADUATE PROGRAM

A complete description of the graduate program in Mathematics appears in a section on graduate programs at the end of this catalog.

Math 100 Liberal Arts Mathematics I
An historical-cultural survey of the main areas of mathematics. Emphasizes the interplay of these areas with man's philosophic, artistic, commercial, social and scientific pursuits.
Prerequisite: Permission of instructor prior to registration.
3 Lect Hrs 4 Credits
Staff

Math 110 Basic Math and College Algebra
For students with weak mathematics background who want to develop skills for further math or science courses. By meeting five days a week the course will cover a review of basic high school mathematics and much of the material in Math 130. Open to students with less than 3 years high school preparation.
5 Lect Hrs 4 Credits
Staff

Math 120 Liberal Arts Mathematics II
Designed for students who do not expect to take many mathematics and/or science courses. Aims at providing an appreciation of the nature of math. Topics serving that end are selected from number theory, elementary topology, combinatorics etc. This course is *not* a prerequisite for other courses and it is *not* the second semester of math 100.
3 Lect Hrs 4 Credits
Staff

Math 125 Elementary Probability Theory
For non-science and non-mathematics majors. Topics include elementary set theory, combinations, permutations and other counting formulas, finite probability theory, random variables and their distributions. Serves as preparation for Math 126 or statistics courses in other departments.
3 Lect Hrs 4 Credits
Staff

Math 126 Elementary Statistics
Statistics without calculus. Begins with brief review of elementary probability. Finite distributions and probability density functions. Computation of elementary analysis of variance and regression. Expectation, confidence intervals and a few distribution-free non-parametric methods of data analysis. Math 125 is suggested as preparation but is not a strict prerequisite.
3 Lect Hrs 4 Credits
Staff

Math 130 College Algebra and Trigonometry
Provides a review of college algebra, trigonometry and enough analytic geometry to begin the calculus sequence. For students with adequate basic math skills who need to review and extend their knowledge of algebra, etc., before taking more advanced courses in math or science. Ordinarily science and math majors should begin with Math 140 and or Math 150. (See also Math 110, which may not be taken for credit in addition to Math 130.)
3 Lect Hrs 4 Credits
Staff

Math 135 Survey of Calculus
Calculus developed intuitively and applied to problems in geometry, physics, and probability. A terminal course for non-science and non-mathematics majors. A student who has already received credit for Math 140 may not receive credit for Math 135.
3 Lect Hrs 4 Credits
Staff

Math 137 Introduction to Mathematical Computer Programming
A detailed introduction to algorithms and problem-solving techniques. Description of one or more algebraic languages. Gives experience in programming and debugging via several problems.
Prerequisite: Math 130 or equivalent.
3 Lect Hrs 4 Credits
Staff

Math 140 Calculus I
The first in the calculus sequence of courses for science and mathematics majors. Starts with the basic concepts of functions and limits. Topics covered include: derivatives and their applications, definite and indefinite integrals with applications to geometrical and physical problems, discussion of algebraic and transcendental functions.
Prerequisite: Math 110 or 130 or equivalent.
4 Lect Hrs 4 Credits
Staff

Math 141 Calculus II
Continuation of Math 140. Topics include — integration, applications of the integral, sequences and series.
Prerequisite: Math 140 or equivalent.
4 Lect Hrs 4 Credits
Staff

Math 150 Analytic Geometry and Determinants
Plane and solid analytic geometry with associated study of vectors, elementary matrices and determinants. Also, a brief review of trigonometry. Provides useful background for Math 140, 141, beginning in Fall 1974 it will be a prerequisite for Math 240.
Prerequisite: Math 130 or equivalent.
3 Lect Hrs 3 Credits
Staff

Math 240 Calculus III
Continuation of Math 141. Primarily calculus of functions of two or more variables. Includes partial differentiation, volume integrals and applications, infinite series.
Prerequisite: Math 141 and 150.
4 Lect Hrs 4 Credits
Staff

Math 255 Differential Equations and Allied Topics
Linear differential equations and ordinary differential equations of the first and second orders. General theory of linear differential equations and physical applications.
Prerequisite: Math 240 or equivalent.
3 Lect Hrs 4 Credits
Staff

Math 260 Linear Algebra I
Elementary theory of vector spaces over the real numbers. Topics include linear independence, bases, dimension, linear maps and matrices, determinants, similarity, eigenvalues and eigenvectors.
Prerequisite: Math 140 or 150
3 Lect Hrs 3 Credits
Staff

Math 261 Linear Algebra II
Topics include the problem of similarity, Jordan Canonical Form, Euclidean and Hermitian Spaces, orthogonality, normal operators, spectral theorem multilinear algebra, quadratic forms, etc.
Prerequisite: Math 260
3 Lect Hrs 3 Credits
Staff

Math 270 Applied Mathematics: Analysis I
Comprehensive review of ordinary differential equations. Series solutions to differential equations, Bessel functions. Characteristic functions. Fourier series.
Prerequisite: Math 255.
3 Lect Hrs 3 Credits
Staff

Math 271 Applied Mathematics: Analysis II
Partial differential equations by separation of variables. Applications of Green, Stokes and Gauss theorems. Variation problems. Introduction to complex functions with applications.
Prerequisite: Math 270.
3 Lect Hrs 3 Credits
Staff

Math 350 Advanced Calculus I
Elementary topology, sequences, continuous and differentiable functions and Riemann integrals in Euclidean spaces. Note: Some topics listed under Math 350 may be covered in Math 351 and vice versa.
Prerequisite: Math 240.
3 Lect Hrs 3 Credits
Staff

Math 351 Advanced Calculus II
Partial differential and approximation by linear transformations, implicit function theorem, some elementary differential geometry and Stokes Theorem.
Prerequisite: Math 350.
3 Lect Hrs 3 Credits
Staff

Math 360 Abstract Algebra I
Review of set theory, an overview of algebraic structures; elementary theory of groups, rings and modules.
Prerequisite: Math 240 or equivalent.
3 Lect Hrs 3 Credits
Staff

Math 361 Abstract Algebra II
Polynomial rings. Field theory, Galois theory. Further topics in group and ring theory.
Prerequisite: Math 360.
3 Lect Hrs 3 Credits
Staff

Math 370 History of Math I
Traces development of mathematics from ancient times to and including the development of calculus. Emphasis will be on the development of mathematical ideas and methods of problem solving.
3 Lect Hrs 3 Credits
Staff

Math 371 History of Math II
Continues the history of math from the development of calculus to the 20th century with some emphasis as in Math 370.
3 Lect Hrs 3 Credits
Staff

Math 425 Numerical Analysis
Approximations of roots, finite differences, interpolation, numerical solutions of differential equations and algebraic equations. (Students will have access to computer terminals.)
Prerequisite: Math 255.
3 Lect Hrs 3 Credits
Staff

Math 440 Theory of Computations
Abstract models of computational processes, mathematical formulations of the notion of effective procedure. Unsolvable problems.
Prerequisite: Math 255 or equivalent.
3 Lect Hrs 3 Credits
Staff

Math 445 Probability and Statistics I
Discrete probability theory, some limit theorems, random variables and generating functions.
Prerequisite: Math 255 or equivalent.
3 Lect Hrs 3 Credits
Staff

Math 446 Probability and Statistics II
Renewal theory, application of renewal theory, stochastic processes. Elementary theory of continuous random variables and some statistical theory.
Prerequisite: Math 445.
3 Lect Hrs 3 Credits
Staff

Math 450 An Introduction to Real Analysis
Real numbers, topology of reals, infinite series, continuity, Weierstrass approximation, differentiation, integration, power series and orthonormal systems.
Prerequisite: Math 351.
3 Lect Hrs 3 Credits
Staff

Math 455 An Introduction to Complex Analysis
Complex numbers, complex functions, power series, trigonometric functions, Moebius transformations. Differentiation and integration of analytical functions. Cauchy's Theorem. Residues, singularities. Meromorphic functions.
Prerequisite: Math 351.
3 Lect Hrs 3 Credits
Staff

Math 458 Theory of Numbers
Prime numbers. Congruences and residues. Approximation of real numbers by rationals. Diophantine equations.
Prerequisite: Junior standing.
3 Lect Hrs 3 Credits
Staff

Math 460 Topics in Geometry
Topics in classical Euclidean and non-Euclidean geometries. Projective geometry, lattices, finite geometries.
Prerequisite: Math 240.
3 Lect Hrs 3 Credits
Staff

Math 465 Differential Geometry
An introduction to classical differential geometry with corresponding modern algebraic approaches, leading to an introduction to Riemannian geometry. Techniques involve tensor analysis and multilinear algebra.
Prerequisite: Math 350.
3 Lect Hrs 3 Credits
Staff

Math 470 Mathematical Logic I
Statement calculus, predicate calculus, axiomatic theories. Truth and validity models.
Prerequisite: Math 260.
3 Lect Hrs 3 Credits
Staff

Math 471 Mathematical Logic II
Properties of formal theories — consistency, completeness, decidability. Godels Incompleteness Theorem for first order arithmetic.
Prerequisite: Math 470.
3 Lect Hrs 3 Credits
Staff

Math 475 Topology
Topological spaces, convergence and continuity, compactness and connectedness properties, introduction to Homotopy theory and combinational topology.
Prerequisite: Math 350 or equivalent.
3 Lect Hrs 3 Credits
Staff

Math 478 Reading in Mathematics
Advanced level study of various topics according to individual interests. Open only to those students who have proven capabilities in mathematics.
Prerequisite: Permission of department prior to registration.
Hrs by Arrangement 3 Credits
Staff

MUSIC

COLLEGE I

Laurence D. Berman, Ph.D., Associate Professor of Music and Chairman; John Huggler, B.M., Associate Professor of Music; Robert Prins, M.M., Associate Professor of Music; Nicholas Tawa, M.A., Associate Professor of Music; J. Jefferson Cleveland, D.M.A., Assistant Professor of Music; Rosemary Leavenworth, M.M., Instructor in Music; David M. Patterson, A.M., Instructor in Music.

GRADUATION REQUIREMENTS

Music majors must take a minimum of 34 credits in music which must include Music 121-22, 221-22, and 202. All Music majors will also be expected to take at least two courses in music history and literature.

All Music majors must acquire at least an elementary proficiency at the piano. A minimum of three years' membership in a University performing group is also required. For more detailed information, the prospective major should apply to the secretary of the Music Department for the syllabus of basic Music major requirements.

Each student majoring in music will be assisted by a departmental advisor to plan a sequence of courses that will suit his own needs and satisfy the requirements of the Music Department.

Music 001 Chorus

3 Lect Hrs 1 Credit
Staff

Music 111-112 Introduction to Music
Basic music materials, principles of design, and the cultural significance of representative works in historical sequence. Designed primarily for non-music majors.
3 Lect Hrs 4 Credits
Staff

Music 121-122 First Year Theory
Harmony, melody and music theory.
Prerequisite: Permission of instructor.
3 Lect Hrs 4 Credits
Staff

Music 123 Ear Training and Sight Singing
A course combining melodic, harmonic dictation and sight singing of melodies. Encompassing simple material to medium difficulty, common and compound time, primary triads.
2 Lect Hrs 2 Credits
Staff

Music 124 Ear Training and Sight Singing
Encompassing medium difficult to difficult melodies, combined rhythms, secondary triads and seventh chords. This is a companion course to Theory 121-122 and Elements of Music 131-132.
2 Lect Hrs 2 Credits
Staff

Music 131-132 Elements of Music
The function of scales, intervals, triads, chords in root position and inversions. Use of nonharmonic tones and modulation, correlated sight-singing, ear training, dictation, analysis and keyboard drill. Designed primarily for Music majors.
2 Lect Hrs 2 Credits
Staff

Music 202 Introduction to Musical Research I
Basic research materials and scholarly procedures.
Prerequisite: Music 111-112 or permission of instructor.
3 Lect Hrs 3 Credits
Mr. Tawa

Music 221 Second Year Theory and Composition
Counterpoint in the 17th, 18th and 20th centuries.
Prerequisite: Music 122.
3 Lect Hrs 3 Credits
Mr. Huggler

Music 222 Second Year Theory and Composition
The study of harmony after 1850 — Emphasis on the 20th century.
Prerequisite: Music 122.
3 Lect Hrs 3 Credits
Mr. Huggler

Music 223-224 Ear Training and Sight Singing
A continuation of Music 123-124. Material consists of melodies illustrating chromaticism, modulation, modes and freer tonality, more complex rhythm, altered chords and contrapuntal music.
2 Lect Hrs 2 Credits
Staff

Music 231 Elements of Music
A continuation of Music 131-132 with some emphasis on contemporary materials.
Prerequisite: Music 131-132 or permission of instructor.
2 Lect Hrs 2 Credits
Staff

Music 232 Elements of Music
A continuation of Music 231 with some emphasis on contemporary materials.
Prerequisite: Music 131-132 or permission of instructor.
2 Lect Hrs, 1 Lab Hr 2 Credits
Staff

Music 234 Development of Chamber Music
Selected works from Haydn to Schonberg, centering chiefly on the medium of string quartet.
Prerequisite: Music 122 or equivalent.
3 Lect Hrs 3 Credits
Mr. Huggler

Music 235 Italian Opera
Development of opera after the Baroque. Emphasis on Mozart, Verdi, the Verissimo, and Stravinsky's — *The Rakes Progress.*
Prerequisite: Music 122.
3 Lect Hrs 3 Credits
Mr. Prins