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GENERAL ANNOUNCEMENT OF COURSES 1944-46 (CATALOG)

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MADISON, WISCONSIN
JUNE, 1945

U. Wisc. 1944-46

MATHEMATICS

117. TECHNICAL AND TRADE JOURNALISM. II; 2 cr. Analysis of editorial and business management of trade journals, house organs, and business papers. Mr. Thayer.

120. INTERPRETING FOREIGN NEWS. Sem; 2 cr. The press of other countries, and the American machinery for gathering foreign news; censorship and propoganda. Prerequisite: Junior standing. Mr. Doan, Mr. Baskette.

121. INTERPRETING HISPANIC AFFAIRS. Yr; 1 cr. I. Spain, Mr. Neale-Silva; II. Spanish America, Mr. Cool.

123. WOMEN'S FIELDS IN JOURNALISM. II; 3 cr. Preparing material for women's departments in newspapers and magazines. Analysis of the fields in journalism open to women. Prerequisite: Junior standing. Miss Patterson.

124. PUBLICITY AND PUBLIC RELATIONS. I, II; 2 cr. Pro-seminary in which each student works in the field of his interest—military, educational, social service, or commercial. Prerequisite: Junior standing. Mr. Thayer, Miss Patterson.

180. INDEPENDENT READING. Yr; 1-4 cr. Mr. Hyde.

200. INDEPENDENT RESEARCH. 2-4 cr. Mr. Hyde and staff.

201-220. GRADUATE SEMINARIES. Yr; 2 cr. Several seminars are offered each semester, selected from a list of twenty subjects, in three-year cycle. The seminars offered in 1943-44 were:

202. SEMINARY. 2 cr. Public opinion and the press. Mr. Hyde.

207. SEMINARY. 2 cr. The press and crime news. Mr. Thayer.

208. SEMINARY. 2 cr. Reader interest surveys. Mr. Sumner.

210. SEMINARY. 2 cr. The newspaper and politics. Mr. Hyde.

213. SEMINARY. 2 cr. The libel laws. Mr. Thayer.

215. SEMINARY. 2 cr. Evolution of the feature article. Miss Patterson.

LATIN

(See Classics, page 97)

MATHEMATICS

PROFESSORS EVANS, INGRAHAM, LANGER, *chairman*, MACDUFFEE, MARCH, SOKOLNIKOFF; ASSOCIATE PROFESSOR TRUMP; ASSISTANT PROFESSORS BRUCK, EISENHART, EVERETT, SPECHT, ULAM; INSTRUCTORS ALLEN, WAGNER.

Courses 1a, 1b, 3a, 3b, and 7 are planned to give a working knowledge of elementary mathematics. Mathematics 7 is required of students in the School of Commerce.

In general students are required to present one full year of mathematics to satisfy the mathematics option for the B.A. degree. However, students who have successfully passed either Mathematics 1b or 3b will be regarded as having fulfilled the mathematics option for the B.A. degree, but students who graduate in Commerce will fulfill the mathematics option for the B.A. degree if they carry Mathematics 7 successfully. Mathematics 7 will not count towards the optional requirement for the B.A., B.S., or Ph.B. degree except for students graduating in the School of Commerce.

MAJOR IN MATHEMATICS. This field of concentration includes all courses taught by the Mathematics Department. The major comprises a minimum of 21 credits which shall consist of a year's course in calculus, Math. 106, and other courses in Mathematics numbered 100 or above excluding Math. 135, and excluding Math. 108 if the student is not enrolled in the School of Education. Students majoring in this department must earn at least as many grade-points as credits in all work included in the major. Students entering the junior class with advanced standing who expect to complete a major in mathematics in four semesters should previously have completed a year's course in calculus.

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NCE

vey of journalism; II Sem.,

; students cover assignments ps. Required of students in

te grade-points in Journ. 2. laboratory. Mr. Doan, Mr.

in typography of advertise- ss.

photography for newspapers to 15 juniors and seniors.

Required of all journalism

style peculiar to journalistic iss Patterson.

problems of radio stations; Prerequisites: Journ. 2 and 3

riting; analysis of editorial

preparing and selling special

preparing periodical articles Each student specializes in

vs of motion pictures, plays,

as of small daily and weekly mpus Publishing Co. plant.

s problems of smaller news- job estimating. Mr. Thayer. ss, copyright, and other laws Mr. Thayer.

wspaper in England and the journalism. Required in the

n of the newspaper to public gy of journalism. Required

i reporting local, state, and rerequisites: Journ. 2 and 3.

e 116.)

College of Letters and Science ount in the School of Commerce.

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MAJOR IN PHYSICS-MATHEMATICS. The courses listed below from (a) to (d) comprise the field of concentration in physics-mathematics. The major consists of the following courses, with a maximum of 40 credits in groups (a) through (d) and a grand total of not more than 50 credits, including group (e).

(a) Mathematics—algebra and trigonometry (which may be completed in high school); analytic geometry and calculus.

(b) Physics 1, 31, or 51-52—10 credits.

(c) A minimum of 6 credits selected from Mathematics 120a, 120b or 112, 104, 116, 117, 118 (120a and 120b refer to the first and second semesters respectively of Mathematics 120).

(d) A minimum of 6 credits selected from Physics 106, 112, 115, 116, 117, 118, 119, 124, 126, 134.

(e) A minimum of 6 credits selected from the following group of courses, which are within the division although not included within this field of concentration. Physics 102, 103, 104; Mathematics 114, 122; Metallurgy 135; Mechanics 101, 107; Electrical Engineering 116, 120, 155; Chemistry 130; Hydraulics 104, 115; Astronomy 6, 101, 102, 116.

COURSE IN APPLIED MATHEMATICS AND MECHANICS. (See pp. 73-75.)

Pi Mu Epsilon, a mathematics club, open to undergraduate students interested in the subject, meets twice a month.

ELEMENTARY COURSES

MATHEMATICS 0. Sem; 0 cr. Elementary algebra and geometry. Open only to war veterans. Mr. Evans and staff.

1a. **ALGEBRA AND TRIGONOMETRY.** Sem; 4 cr. For students presenting one unit of algebra for entrance. This course or Mathematics 3a is a prerequisite to all other courses.

1b. **ALGEBRA AND ANALYTIC GEOMETRY.** Sem; 4 cr. Prerequisite: Math. 1a or two units of high-school algebra. The continuation of Math. 1a for students presenting one unit of algebra for entrance. Mr. Evans and staff.

1. **TRIGONOMETRY.** Sem; 2 cr. Prerequisite: Two years of high school algebra or the equivalent. Mr. Evans and staff.

3a. **ALGEBRA AND TRIGONOMETRY.** Sem; 4 cr. For students presenting one and a half units of algebra for entrance. This course or Mathematics 1a is a prerequisite to all other courses. Mr. Evans and staff.

3b. **ALGEBRA AND ANALYTIC GEOMETRY.** Sem; 4 cr. Prerequisite: Math. 3a, or two units of high-school algebra and one half unit of trigonometry. The continuation of Math. 3a for students presenting one and a half units of algebra for entrance. Mr. Evans and staff.

7. **THEORY OF INVESTMENT.** Sem; 4 cr. Prerequisite: Math. 1a or 3a, or two units of high-school algebra. Primarily for students in the pre-commerce sequence.

24. **THEORY OF LIFE INSURANCE.** Sem; 3 cr. Prerequisite: Math. 7 and either consent of instructor or sophomore standing.

50. **SUB-FRESHMAN ALGEBRA.** Sem; no cr. For students who fail to pass the examination for admission to Math. 51. Mr. MacDuffee and staff.

51. **ELEMENTARY MATHEMATICAL ANALYSIS.** Sem; 5 cr. Required of freshmen in engineering. Mr. MacDuffee and staff.

52. **ELEMENTARY MATHEMATICAL ANALYSIS.** Sem; 5 cr. A continuation of Math. 51. Required of freshmen in engineering. Mr. MacDuffee and staff.

53. **ELEMENTARY MATHEMATICAL ANALYSIS.** Sem; 5 cr. A course designed to prepare for calculus in one semester those engineering students who offer a minimum of two years of high-school algebra and a course in trigonometry. Admission to this course is by an examination. Mr. MacDuffee and staff.

INTER

Under existing conditions of one year. The student is referred to 101, 102, 103, and 106 may not be in mathematics, engineering, or other

101a. **CALCULUS.** Sem; 4 cr

101b. **CALCULUS.** Sem; 4 cr

102a. **CALCULUS.** Sem; 4 cr
Math. 52. Mr. MacDuffee and staff

102b. **CALCULUS.** Sem; 4 cr
in engineering. Mr. MacDuffee and staff

103a. **CALCULUS.** Sem; 3 cr

103b. **CALCULUS.** Sem; 3 cr

104a. **STATICS.** Sem; 3 cr
couples. Conditions of equilibrium benefit by a knowledge of the a varied use of algebra, geometry planning to go further into the Mathematics 104 which is combined

104. **ELEMENTS OF MECHANICS** of a particle and of a rigid body

106. **ADVANCED ANALYTIC GEOMETRY** and a treatment of registration.

108. **COLLEGE GEOMETRY.** emphasis on the postulational toward the mathematics required

110. **HIGHER MATHEMATICS** cation of mathematics, selected Fourier series.

111. **HIGHER MATHEMATICS** 110, but Mathematics 110 is required vector analysis, topics from previous

112. **DIFFERENTIAL EQUATIONS** solution for equations of various

114. **ADVANCED COLLEGE ALGEBRA** partial fractions, determinant Math. 101b or 103b, or concurrent

115. **THEORY OF EQUATIONS** higher degree, theory of elliptic calculus.

116. **HIGHER ANALYSIS.** Year

117. **VECTOR ANALYSIS.** Semester an introduction to tensor analysis

118. **INTRODUCTION TO THE** cation of probabilities; permutation Bernoulli and Laplace. Probability statistics. Prerequisite: Differential

120. **ADVANCED CALCULUS.**

122. **PROJECTIVE GEOMETRY** are extended to projective geometry

INTERMEDIATE AND ADVANCED COURSES

Under existing conditions only a selected set of the following courses are given in any one year. The student is referred to the time table for more specific information. Courses 101, 102, 103, and 106 may not be taken for graduate credit by students majoring in mathematics, engineering, or other fields requiring these courses in the undergraduate sequence.

101a. CALCULUS. Sem; 4 cr. Prerequisite: Math. 1b. Staff.

101b. CALCULUS. Sem; 4 cr. Continuation of Math. 101a.

102a. CALCULUS. Sem; 4 cr. Required of all sophomores in engineering. Prerequisite: Math. 52. Mr. MacDuffee and staff.

102b. CALCULUS. Sem; 4 cr. Continuation of Math. 102a. Required of all sophomores in engineering. Mr. MacDuffee and staff.

103a. CALCULUS. Sem; 3 cr. Prerequisite: Math. 3b.

103b. CALCULUS. Sem; 3 cr. Continuation of Math. 103a.

104a. STATICS. Sem; 3 cr. The composition and resolution of forces, moments and couples. Conditions of equilibrium, with applications. All students of mathematics will benefit by a knowledge of the principles of statics. The course provides an opportunity for a varied use of algebra, geometry, trigonometry and the elements of the calculus. Students planning to go further into the field of applied mathematics should follow the course by Mathematics 104 which is concerned with kinematics and dynamics.

104. ELEMENTS OF MECHANICS AND VECTOR ANALYSIS. Yr; 3 cr. Statics and dynamics of a particle and of a rigid body. Prerequisite: A semester of calculus.

106. ADVANCED ANALYTIC GEOMETRY. Sem; 3 cr. Advanced topics in plane analytic geometry and a treatment of solid analytic geometry. Prerequisite: Calculus or concurrent registration.

108. COLLEGE GEOMETRY. Sem; 3 cr. Advanced topics in Euclidean geometry with emphasis on the postulational method. Open to juniors and seniors. May be counted toward the mathematics requirement for the teaching major and minor. Mr. Trump.

110. HIGHER MATHEMATICS FOR ENGINEERS. Sem; 3 cr. A course concerned with application of mathematics, selected topics from algebra, and advanced calculus. Infinite series, Fourier series.

111. HIGHER MATHEMATICS FOR ENGINEERS. Sem; 3 cr. A continuation of Mathematics 110, but Mathematics 110 is not a prerequisite. Ordinary and partial differential equations, vector analysis, topics from probability and statistics.

112. DIFFERENTIAL EQUATIONS. 3 cr. A first course in differential equations. Methods of solution for equations of various types. Prerequisite: A year course in calculus.

114. ADVANCED COLLEGE ALGEBRA. Sem; 3 cr. Real and complex numbers, theory of partial fractions, determinants, matrices, and systems of linear equations. Prerequisite: Math. 101b or 103b, or concurrent registration.

115. THEORY OF EQUATIONS. Sem; 3 cr. Methods of solution of algebraic equations of higher degree, theory of elimination, symmetric functions. Prerequisite: A semester of calculus.

116. HIGHER ANALYSIS. Yr; 3 cr.

117. VECTOR ANALYSIS. Sem; 3 cr. A course in the algebra and calculus of vectors with an introduction to tensor analysis. Applications to geometry and physics are stressed.

118. INTRODUCTION TO THE THEORY OF PROBABILITY. Sem; 3 cr. Addition and multiplication of probabilities; permutations and combinations. Theorems of Bayes, Tshebysheff, Bernoulli and Laplace. Probabilities in continuum. Applications to geometry, physics and statistics. Prerequisite: Differential and integral calculus.

120. ADVANCED CALCULUS. Yr; 3 cr. Prerequisite: A year course in calculus.

122. PROJECTIVE GEOMETRY. Yr; 3 cr. The methods of elementary analytic geometry are extended to projective geometry; the synthetic viewpoint is also considered. Applica-

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tions to rectilinear figures and conic sections. Prerequisite: Math. 106 or consent of instructor.

135. INTRODUCTION TO STATISTICAL METHODS IN THE NATURAL SCIENCES. Sem; 3 cr. For the student seeking experience in the calculation and interpretation of statistical measures and techniques suited to the analysis of small samples. Prerequisite: Math. 1b or 3b, or 36. Two lectures; 3 hours laboratory.

137. MATHEMATICS OF STATISTICS. Sem; 3 cr. A course dealing with frequency distributions, dispersion, sampling theory, simple and multiple correlation, and curve fitting. Prerequisite: Differential and integral calculus.

173. A CRITIQUE OF ELEMENTARY AND COLLEGIATE MATHEMATICS. Sem; 3 cr. The historical development with an analysis of the content and interrelations of selected topics in elementary and intermediate mathematics. Open to majors in the Department of Mathematics in their senior year, to graduates, and to others upon consent of the instructor.

180. DIRECTED READING AND INDEPENDENT STUDY.

GRADUATE COURSES

200. READING AND RESEARCH. Staff.

217. TENSOR ANALYSIS. Sem; 3 cr. A course in the algebra and calculus of tensors and their applications to various branches of applied mathematics, including the theory of relativity.

219. DIFFERENTIAL GEOMETRY. Sem; 3 cr. A study of curves and surfaces in three dimensions by classical methods, followed by an introduction to corresponding problems in n -dimensions involving tensor methods.

220. THEORY OF ANALYTIC FUNCTIONS. Yr; 3 cr. This course is fundamental in analysis. Content restricted to functions of the complex variable. Some special interest in the application of mathematics to physics. Mr. Langer.

221. THEORY OF FUNCTIONS OF A REAL VARIABLE. Yr; 3 cr. Mr. Langer.

222. PROJECTIVE DIFFERENTIAL GEOMETRY. Sem; 3 cr. A course in the classical differential theories of curves and surfaces in real and complex projective spaces. Foundations and generalizations will be considered.

230. TOPICS IN THE FOUNDATIONS OF MATHEMATICS. Sem; 3 cr.

231. FOUNDATIONS AND MODERN METHODS OF PROBABILITY. Sem; 3 cr. Basic probability postulates, functions of a random variable, Stieltjes integrals, characteristic functions, and fundamental limit theorems. Mr. Evans.

243. MODERN THEORY OF DIFFERENTIAL EQUATIONS. Sem; 3 cr. A critical consideration of the ordinary differential equations in the domain of real variables. Existence theorems. Theorems of oscillation and comparison. Boundary conditions, the Green's function, and the development of functions in terms of solutions of differential equations. Mr. Langer.

244. HIGHER GEOMETRY. Sem; 3 cr. Projective geometry in three and higher dimensions. The postulational approach to the subject will also be considered.

250. THEORY OF ELASTICITY. Yr; 3 cr. Mr. Sokolnikoff.

261. ABSTRACT ALGEBRA. Yr; 3 cr. Theory of numbers, abstract groups, algebraic and Galois fields, and matrices, with an introduction to modern abstract algebra. Mr. MacDuffee.

263. HIGHER ALGEBRA. 3 cr. Matrices, linear dependence and independence, quadratic and Hermitian forms, elementary divisors, and an introduction to matrix equations.

265. HARMONIC ANALYSIS. Yr; 3 cr. Boundary value problems connected with the partial differential equations of ordinary occurrence in mathematical physics. Fourier's series, series of Bessel's function, and spherical harmonics.

267. CALCULUS OF VARIATIONS. Sem; 3 cr. An introductory course devoted to the classical theory and problems. Prerequisite: Differential and integral calculus. Mr. Langer.

268. PARTIAL DIFFERENTIAL EQUATIONS. The partial differential equations of second order. Mr. Langer.

269. THEORY OF INTEGRAL EQUATIONS. An approach to the equations of Volterra.

270. LINEAR TRANSFORMATIONS. Finite dimensional generalizations. Linear transformations and their connections with the theory of matrices.

271. LINEAR ALGEBRAS. Sem. of finite order and their associated problems. Mr. Langer.

272. SEMINARY IN ALGEBRA.

273. SEMINARY IN ANALYSIS.

274. THEORY OF NUMBERS. Properties of the rational integers and certain Diophantine problems.

278. ORDINARY DIFFERENTIAL EQUATIONS. The properties and functions of the variables are complex variable is a prerequisite.

284. SEMINARY IN THE FOUNDATIONS OF PHYSICS.

Physics 211. ADVANCED DYNAMICS. Hamilton's equations, elements of mechanics.

Physics 215. THEORY OF ELECTRICITY. treatment of Maxwell-Lorentz equations. those distributions of matter and energy.

Courses in Theory of Potentials, Analytic Theory of Equations, and Infinite Series of Functions.

THE TEACHING OF MATHEMATICS

1. INTRODUCTION TO METEOROLOGY. Physics 1, 31, or 51-52, or consent of instructor.

103. METEOROLOGY. Yr; 3 cr. Prerequisites: Mathematics 112; Physics 1, 31, or 51-52, or consent of instructor.

106. CLIMATOLOGY. Yr; 3 cr. of climatological observations.

110. SYNOPTIC AND AERONAUTIC METEOROLOGY. 1. Lectures and laboratory course 1.