CURRICULUM

GENERAL DESCRIPTION

The curriculum of Williams College provides, in the first place, for the continuation of the principal subjects offered at admission by prescribing in the Freshman year the study of Latin, English, Mathematics, and the other language of the admission group in which the student enters, together with Elementary French or German. In the second place, by organizing the courses of the last three years in eleven Major Groups arranged in three Divisions, the curriculum secures the concentration of part of the student's work in one well-defined field and the distribution of another part among different subjects. A Major Group consists in general of a Sophomore introductory course, three prescribed courses in Junior year, and two advanced year-courses (or their equivalent in semester-courses) in the Senior year. The rest of the student's work is elective, subject to the requirement that in Sophomore year he shall take at least one course in each Division, and, after Sophomore year, at least one year-course from each of the two Divisions in which his Major Group is not placed.

Any student of very high scholarship may, with the written approval of the professors concerned, petition the Faculty for greater freedom of election of courses in the Junior and Senior years than is afforded by the arrangement of the curriculum. Such petitions will be referred to the Advisory Committee for consideration and report to the Faculty and will be decided with a view to the establishment in due time of a system of honors courses.

The Exhibit of Divisions and Major Groups is given on pages 58–59. All elections are subject to the prerequisites published on pages 60–94.

FRESHMAN YEAR

In the Freshman year each student must take Latin, English, Mathematics, and two of the three languages, Greek, French, and German. If a student has anticipated any required course of the Freshman year (see p. 57), he may substitute therefor any Sophomore course for which he has the proper prerequisite.

SOPHOMORE YEAR

The student must take four courses, at least one in each Division, from those open to Sophomores. One of these shall serve as the introductory course of the Major Group which is to be selected at the end of the Sophomore year.

JUNIOR YEAR

Each student must take the three courses of the Major Group that he has selected. He must also elect two other courses. Either in this year or the next, at least one year-course (or its equivalent in semester-courses) must be taken in each of the two Divisions other than that in which the Major Group is placed.

SENIOR YEAR

Each student must complete his Major Group by taking two year-courses or their equivalent in semester-courses from those comprised in the Group. He must also elect at least two other year-courses or their equivalent, completing, if he has not already done so, the requirement of one year-course, or its equivalent, after Sophomore year in each of the two Divisions other than that in which the Major Group is placed.

EXHIBIT OF DIVISIONS AND GROUPS

Odd numbers refer to the first semester, even numbers to the second semester. Year-courses have their two semester numerals joined by a hyphen.

Divisions	Major Groups	Freshman Courses	Sophomore Courses	Junior Groups	Senior Electives	
I	GREEK	Greek 1-2	Greek 3-4	a. Greek 5-6 b. Latin 3-4 c. Greek 11-History 12	Greek 7 Greek 8 Greek 9 Greek 10	Latin 5-6 Latin 7 Latin 8
	LATIN	Latin 1-2	Latin 3-4	a. Latin 5-6 b. Greek 3-4 (German* for non-Greek men) c. Greek 11-History 12	Greek 5-6 Greek 7 Greek 8 Greek 9	Greek 10 Latin 7 Latin 8
	FRENCH	French*	French*	a. French* b. Italian 1-2 c. History 1-2 (History 5-6)	French* Italian 3-4 Spanish 1-2	
	GERMAN	German*	German*	a. German* b. Literature 9-10 c. History 1-2 (History 5-6)	German* German*	
II	ENGLISH	Rhetoric 1-2	Literature 1-Rhetoric 4	a. Literature 3-4 b. Literature 5-6 c. Rhetoric 5-6	Literature 2 Literature 8 Literature 9-10 Literature 11	Literature 12 Literature 13 Rhetoric 7
	HISTORY		History 1-2	a. History 3-4 b. Economics 1-2 c. Government 1-2	History 5-6 History 7 History 8 History 10 Greek 11-History 12 Economics 3 Economics 4 Economics 5	Economics 6 Government 3 Government 4 Government 5 Government 6 Government 7 Government 8 Government 9
	PHILOSOPHY			a. Philosophy 1-2 b. Religion 1-2 c. Chemistry 1-Biology 2 (Biology 3-4)	Philosophy 3 Philosophy 4 Philosophy 5 Philosophy 6 Philosophy 7	Philosophy 8 Religion 3-4 Religion 5 Religion 6
	Special Subjects not parts of Major Groups	Art	History 1-2	Art 1-2	Art 3	Art 4
		Oratory	Literature 1-Rhetoric 4	Oratory 1-2		
III	MATHEMATICS	Mathematics 1-2	Mathematics 3-4	a. Mathematics 5-6 b. Mathematics 7-8 c. Physics 1-2	Mathematics 9 Mathematics 10 Physics 3-4	Physics 5-6 Physics 7 Physics 8
	PHYSICS		Physics 1-2	a. Physics 3-4 b. Mathematics 3-4 c. Chemistry 1-2	Physics 5-6 Physics 7 Physics 8 Mathematics 5-6 Mathematics 7-8 Mathematics 9 Mathematics 10	Chemistry 3-4 Chemistry 5 Chemistry 6 Chemistry 7 Chemistry 8 Chemistry 10
	CHEMISTRY		Chemistry 1-Chemistry 2	a. Chemistry 3-4 b. Physics 1-2 c. Geology 1-2	Chemistry 5 Chemistry 6 Chemistry 7 Chemistry 8 Chemistry 10 Physics 3-4	Physics 5-6 Physics 7 Physics 8 Geology 3 Geology 4
	BIOLOGY		Chemistry 1-Biology 2	a. Biology 3-4 b. Biology 5-6 c. Geology 1-2	Biology 7-8 Physiology 1 Physiology 2	Geology 3 Geology 4
	Special Subject not part of Major Groups	Astronomy	Physics 1-2	Astronomy 1-2	Astronomy 3	Astronomy 4

* The modern language courses of Freshman year in the French and German groups will be determined by the admission record of the student. The modern language courses after Freshman year will follow in sequence. See announcements of the departments of German and Romance Languages.

WILLIAMS COLLEGE

DIVISION III

MATHEMATICS

Professor FERRY, Professor HARDY, Assistant Professor SHEPARD, Mr. BOTSFORD, and Dr. AGARD.

MATHEMATICS 1-2. *Algebra, Solid Geometry, Plane Trigonometry, and Surveying.*

Advanced Algebra. Binomial theorem, logarithms, permutations, combinations, method of undetermined coefficients, determinants, theory of equations, etc. Hawkes's *Higher Algebra* is used as a text-book.

Solid Geometry. Books VI, VII, and VIII of Wentworth's *New Plane and Solid Geometry*, together with original propositions and numerical problems.

Plane Trigonometry. The trigonometric functions, trigonometric analysis, solutions of right and oblique triangles, etc. Robbins's *Trigonometry* is used as a text-book.

Field Work in Surveying. The practical use of instruments, including determination of heights, simple triangulation, measurement of areas, and leveling. This portion of the course is optional.

Freshman required course.

Four hours a week through the year.

Professor HARDY, Assistant Professor SHEPARD, Mr. BOTSFORD, and Dr. AGARD.

MATHEMATICS 3-4. *Analytic Geometry and Differential Calculus.*

Mathematics 3. Analytic Geometry. Plane analytic geometry,—the straight line, circle, parabola, ellipse, and hyperbola,—with an introduction to analytic geometry of three dimensions. Wentworth's *Analytic Geometry* is the text-book used.

The first semester.

Professor FERRY and Assistant Professor SHEPARD.

Mathematics 4. Differential Calculus. Methods of differentiation, expansion of functions into series, indeterminate forms, the simpler applications to mechanics and to the theory of plane curves, etc. Granville's *Calculus* is the text-book used.

The second semester.

Assistant Professor SHEPARD and Dr. AGARD.

Sophomore elective course, required of Freshmen in Admission Groups IV and V; prerequisite, *Mathematics 1-2.*

Four hours a week through the year.

MATHEMATICS 5-6. *Differential and Integral Calculus.*

Mathematics 5. Integral Calculus. Derivation and application of the fundamental formulas of integration; applications of the integral calculus to the determination of lengths of curves, areas, volumes, mean values, moments of inertia, etc. The work is based on Granville's *Calculus* and *A Course in Mathematics* by Woods and Bailey.

The first semester.

Professor HARDY.

Mathematics 6. Differential and Integral Calculus. A continuation of the work of the first semester. Numerous applications of the differential and integral calculus are considered. The work is based on Granville's *Calculus* and *A Course in Mathematics* by Woods and Bailey.

The second semester.

Dr. AGARD.

Junior elective course, open also to Sophomores in Admission Groups IV and V; prerequisite, *Mathematics 3-4.*

Three hours a week through the year.

MATHEMATICS 7-8. *Descriptive Geometry.* Problems of the straight line and plane, curved surfaces, intersections and development of surfaces, simple warped surfaces. Elements of shades and shadows. Anthony and Ashley's *Descriptive Geometry* and Fishleigh's *Problems* are used as text-books.

Junior elective course; prerequisite, *Mathematics 3-4.*

Three hours a week through the year.

Assistant Professor SHEPARD.

MATHEMATICS 9. *Differential Equations.* Methods of solution of the simpler forms of differential equations, applications to many problems of mathematical physics, etc. The course is based on Cohen's *Differential Equations.*

Senior elective course; prerequisite, *Mathematics 5-6.*

Three hours a week during the first semester.

Dr. AGARD.

MATHEMATICS 10. *Modern Methods in Analytic Geometry.* Abridged notation, line coördinates, harmonic division, projection, etc., with many applications. Lectures, with references to Salmon's *Conic Sections* and other works.

Senior elective course; prerequisite, *Mathematics 5-6* or *Mathematics 7-8.*

Three hours a week during the second semester.

Professor FERRY.

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MATHEMATICS 20. *Theory of Equations, Spherical Trigonometry, etc.* Various text-books are used and the work is adapted to the particular qualifications of the students admitted to the course.

Limited Freshman course, open to those who have anticipated *Mathematics D* and *Mathematics F*.

Three hours a week during the second semester.

Dr. AGARD.

PHYSICS

Professor MCELFRESH and Mr. SHRADER.

PHYSICS 1-2. *General Physics.* This course deals with the elementary facts and principles of physics and with the applications of physical laws to the experiences and phenomena of daily life. It includes elementary mechanics, sound, heat, light, magnetism, and electricity.

Sophomore elective course.

Four exercises a week through the year; these are lectures and recitations (three hours a week) and laboratory work (one two-hour exercise a week). For laboratory work the class is divided into small divisions; two-hour periods are assigned for this work to fit individual schedules.

Fee, $5.00.

Professor MCELFRESH and Mr. SHRADER.

PHYSICS 3-4. *Experimental Physics.* Mechanics, sound, heat, light, magnetism, and electricity. This course consists of a series of physical measurements in the laboratory, accompanied by lectures. The lectures deal with the methods and principles involved in the laboratory work and also discuss certain physical problems that do not readily lend themselves to laboratory experimentation. In the laboratory work high-grade instruments of precision are employed and the course is expected to give some skill in accurate measurement. The primary object of the laboratory work is to enable the student to familiarize himself with physical phenomena by direct personal observation.

Junior elective course; prerequisite, *Physics 1-2.*

Three exercises a week through the year; lectures and recitations (one hour a week), and laboratory work (two two-hour periods a week).

Fee, $10.00.

Professor MCELFRESH and Mr. SHRADER.

PHYSICS 5-6. *Electrical Measurements and Practical Applications of Electricity.* This course consists of lectures and laboratory work and includes a study of the magnetic properties of iron and steel, of direct and alternating current phenomena, and of their practical illustration in dynamo-electric machinery.

Senior elective course; prerequisite, *Physics 3-4.*

Three exercises a week through the year; lectures and recitations (two hours a week), and laboratory work (one two-hour period a week).

Fee, $10.00.

Mr. SHRADER.

PHYSICS 7. *Mechanics.* The general principles of mechanics of solids; statics and kinetics of rigid bodies. Lectures and problems.

Senior elective course; prerequisite, *Mathematics 3-4* and *Physics 1-2.*

Three exercises a week during the first semester.

Professor MCELFRESH.

PHYSICS 8. *Mechanics.* A continuation of *Physics 7.* Elasticity of solids, liquids, and gases. Statics and kinetics of liquids and gases. Lectures, problems, and laboratory work.

Senior elective course; prerequisite, *Physics 7.*

Three exercises a week during the second semester.

Professor MCELFRESH.

CHEMISTRY

Professor LEVERETT MEARS, Assistant Professor BRAINERD MEARS, Mr. ADRIANCE, and Mr. STEIN.

CHEMISTRY 1-2. *General Chemistry and Qualitative Analysis.*

Chemistry 1. General Chemistry. The principles of chemistry are studied in connection with the non-metals and their compounds. This course is given by experimental lectures, supplemented by recitations and practical work in the laboratory.

Fee, $3.00.

Four hours a week during the first semester.

Chemistry 2. Metallic Chemistry and Qualitative Analysis. A course of lectures is given on the occurrence, properties, and uses of the metals and their compounds.

Most of the time is devoted to qualitative analysis in the laboratory. This work includes the reactions of the principal bases and acids, their detection and separation. About 100 solutions and 100 solid substances, including about 50 mineral, are analyzed during the course. This course is a continuation of *Chemistry 1.*

Fee, $10.00 and breakage.

Four periods a week, of two hours each, during the second semester.

Sophomore elective course.

Professor LEVERETT MEARS, Assistant Professor BRAINERD MEARS, and Mr. STEIN.