

above that of "passed," that is, the grade of seventy per cent or over, on half of these one hundred and twenty hours; she must also possess at the time of graduation a reading knowledge of French and German and some acquaintance with Latin. In the last year before graduation, oral examinations are held to test her ability to read French and German at sight.

The following course of study must be pursued by every candidate for the degree of Bachelor of Arts:

*Required Studies.* *Greek or French or German,\** five hours a week for one year, when this subject has not been included in the examination for matriculation. Those students, however, who wish to omit Greek may substitute for the required course in Greek the minor course in Latin.†

20 hr *English,* five hours a week for two years.

10 *Philosophy,* five hours a week for one year.

10 *Science,* five hours a week for one year.

10 *Science, or History, or Economics and Politics, or Law, or Mathematics,* five hours a week for one year.

*Group.* *Two Major Courses,* of five hours a week for two years each, constituting one of the following Groups: any Language with any Language‡; History with Economics and Politics, or Law; Economics and Politics with Philosophy, or Law; Philosophy with Greek, or English, or Mathematics, or Physics; Mathematics with Greek, or Latin, or Physics, or Chemistry, or Geology; any Science with any Science.

*Free Elective Courses* *Free Elective Courses,* amounting to ten hours a week for one year, to be chosen by the student. It should be noted that a single study may be taken as a free elective, without electing the group that includes it, and

once obtained in an examination may not be cancelled, the first one hundred and twenty hours of examinations offered qualifying, or disqualifying, for a degree. Grades received on examinations offered for work not taken in the college classes must be counted in these one hundred and twenty hours.

\* The College provides matriculation classes, five hours a week throughout one year, for those students who in the examination for matriculation may have omitted Greek, French, or German. Attendance on these classes is not obligatory before the beginning of the junior year, the student being free until then to make good her deficiencies by private study.

† A student choosing Latin as one of the languages of her Group, and not wishing to study Greek, may substitute for the year of minor Latin a year of post-major Latin, or a year of French, or German, or Italian, or Spanish.

‡ For the purpose of forming a Group, Italian and Spanish count as one language; they may be combined so as to form a course of five hours a week for two years, as explained on page 104.

any courses open as free electives, may be chosen without taking the remainder of the minor course of which they may form a part.

These studies may for convenience be tabulated as follows: *Tabular Statement.*

*Required Courses (Five hours a week for One Year Each).*

1 and 2	3.	4.	5.	6.*
English. [Two Courses.]	Philosophy.	Science: Physics, or Chemistry, or Geology, or Biology.	Science, or History, or Economics and Politics, or Law, or Mathematics.‡	Matriculation French, or Matriculation German, or Matriculation Greek (or Minor Latin).†

*Two Major Courses (Five hours a week for Two Years Each).*

Constituting any one of the following thirty-four groups:

I—XV. Any Language with any Language§ (Fifteen Groups).	XVI. History with Economics and Politics.	XVII. History with Law.	XVIII. Economics and Politics with Law.
XIX. Economics and Politics with Philosophy.	XX. Philosophy with Greek.	XXI. Philosophy with English.	XXII. Philosophy with Mathematics.

\* The College provides matriculation classes, five hours a week throughout one year, for those students who in the examination for matriculation may have omitted Greek, French, or German; students not wishing to study Greek may substitute the course in minor Latin for the examination in matriculation Greek. Attendance on these classes is not obligatory before the beginning of the junior year, the student being free until then to make good her deficiencies by private study.

† A student choosing Latin as one of the languages of her Group, and not wishing to study Greek, may substitute for the year of minor Latin a year of post-major Latin, or a year of French, or German, or Italian, or Spanish.

‡ Students electing minor Mathematics must also elect Trigonometry, two hours for one semester, or offer it for examination before entering the course in Minor Mathematics.

§ For the purpose of forming a Group, Italian and Spanish count as one language; they may be combined so as to form a course of five hours a week for two years, as explained on page 104.

XXIII. Philosophy with Physics.	XXIV. Mathematics with Greek.	XXV. Mathematics with Latin.	XXVI. Mathematics with Physics.
XXVII. Mathematics with Chemistry.	XXVIII. Mathematics with Geology.	XXIX—XXXIV. Any Science with any Science (Six Groups).	

*Free Elective Courses.*

Ten hours a week for one year in any subject, or subjects, the student may elect.

*The Group System.*

All candidates for the degree of Bachelor of Arts must elect their courses in accordance with the Group System, and a comprehension of it is essential to an understanding of the courses of instruction.

*Major Course.*

In all departments as yet fully organised there is a course of five hours a week for two years, called a Major Course. Whenever one year of this course is of such a nature that it may be taken separately, it is marked as a Minor Course. It is required of every candidate for a degree to take two such major courses as shall be homogeneous, or shall complete each other, and major courses which fulfil this condition are designated as Groups. The object of this system is to enable the student to acquire the foundations of a specialist's knowledge; and the Required Courses, namely, English, philosophy, science, and history, or economics and politics, or law, or mathematics, are intended in part to supplement the Group, and in part to insure a more liberal training than could be obtained if every student combined elective studies at pleasure.

1 Major course = 20 hrs

*Required Courses.*

The required two years' course in English serves as a general introduction to the study of language and comparative literature. The required two years in science (or the substitute permitted of one year's course in science and one year's course in history, economics and politics, law, or mathematics), permit the student of chemistry and biology to pursue advanced courses in one or both of these branches, or to take a major course in physics; and they give for one year at least to the student of history and literature the same kind of instruction and discipline as is

received by the scientific student. The one year's course in philosophy is a general introduction into the study of the laws, conditions, and history of thought.

In almost all departments post-major courses are organised and may be elected by students that have completed the major, or group, work in the subject.

*Post-major Courses.*

All minor courses that do not presuppose required courses may be elected by any student, and special free elective courses of one, two, or three hours a week, are offered in many departments.

*Free Elective Courses.*

The following may serve as examples of some of the many combinations of studies that may be made by those candidates for a degree who wish to specialise as far as possible in particular departments: Matriculation French, Matriculation German, Matriculation Greek, and Minor Latin are bracketed as being properly included in the examination for matriculation. These bracketed courses may be offered for examination without attendance on the college classes.

**CLASSICS.** *As Required Studies*, [Matriculation French, or Matriculation German, or Matriculation Greek], English, Philosophy, Science (Physics, Chemistry, Geology, or Biology), another Science, (or Mediæval, or Oriental History, or Minor Economics and Politics, or Minor Law, or Minor Mathematics). *As a Group*, Greek and Latin. *As Free Electives*, Post-major Greek and Latin, or Classical Art and Archæology, ten hours a week for one year.

**MODERN LANGUAGES** (other than English). *As Required Studies*, [Matriculation French, or Matriculation German, or Matriculation Greek, or Minor Latin], English, Philosophy, Science (Physics, Chemistry, Geology, or Biology), another Science, (or Mediæval, or Oriental History, or Minor Economics and Politics, or Minor Law, or Minor Mathematics). *As a Group*, German and French, or German and Italian and Spanish, or French and Italian and Spanish. *As Free Electives*, Italian and Spanish, or Post-major French or German, ten hours a week for one year.

**ENGLISH.** *As Required Studies*, [Matriculation French, or Matriculation German, or Matriculation Greek, or Minor Latin], English, Philosophy, Science (Physics, Chemistry, Geology, or Biology), another Science, (or Mediæval, or Oriental History, or Minor Economics and Politics, or Minor Law). *As a Group*, Greek and English, or Latin and English, or English and German, or English and French, or English and Italian and Spanish, or English and Philosophy. *As Free Electives*, Latin and German, ten hours a week for one year.

MATHEMATICS (with Greek). *As Required Studies*, [Matriculation French, or Matriculation German, or Matriculation Greek], English, Philosophy, Physics, another Science, (or Post-major Mathematics, or Mediaeval, or Oriental History, or Minor Economics and Politics, or Minor Law). *As a Group*, Mathematics and Greek. *As Free Electives*, Trigonometry, Post-major Mathematics, and Post-major Greek, ten hours a week for one year.

MATHEMATICS (with Physics). *As Required Studies*, [Matriculation French, or Matriculation German, or Matriculation Greek, or Minor Latin], English, Philosophy, Chemistry, another Science, (Geology, or Biology), or Post-major Mathematics. *As a Group*, Mathematics and Physics. *As Free Electives*, Trigonometry, Post-major Mathematics, and Post-major Physics, ten hours a week for one year.

HISTORY. *As Required Studies*, [Matriculation French, or Matriculation German, or Matriculation Greek, or Minor Latin], English, Philosophy, any Science, another Science, (or Oriental History or Post-major History, or Economics and Politics, or Law, or Mathematics). *As a Group*, History and Economics and Politics, or History and Law. *As Free Electives*, Post-major History and Economics and Politics, ten hours a week for one year.

LAW. *As Required Studies*, [Matriculation French, or Matriculation German, or Matriculation Greek, or Minor Latin], English, Philosophy, any Science, another Science, (or History or Economics and Politics, or Mathematics). *As a Group*, History and Law, or Economics and Politics and Law. *As Free Electives*, Economics and Politics and Oriental History, ten hours a week for one year.

SCIENCE. *As Required Studies*, [Matriculation French, or Matriculation German, or Matriculation Greek, or Minor Latin], English, Philosophy, Physics, or Chemistry, or Geology, or Biology. *As a Group*, Physics and Chemistry, or Physics and Geology, or Physics and Biology, or Chemistry and Geology, or Chemistry and Biology, or Geology and Biology. *As Free Electives*, Mathematics and Physics, or Chemistry, or Geology, or Biology, ten hours a week for one year.

The following combinations may be adopted by those who wish to pursue a three years' course in history, economics and politics, or science, yet do not wish to elect an historical, economic, or scientific group.

I. *As Required Studies*, [Matriculation French, or Matriculation German, or Matriculation Greek, or Minor Latin], English, Philosophy, any Science, Mediaeval History. *As a Group*, any Language with any Language, or Chemistry and Biology. *As Free Electives*, Modern History, five hours a week for one year, and Post-major History five hours a week for one year.

II. *As above*, but for Mediaeval History substitute Minor Economics and Politics, and for Modern History, Major Economics and Politics, and for Post-major History, Post-major Economics and Politics.

III. *As Required Studies*, [Matriculation French, or Matriculation German, or Matriculation Greek, or Minor Latin], English, Philosophy, Physics, or Chemistry, or Geology, or Biology. *As a Group*, any Language with any Language. *As Free Electives*, Major and Post-major-Physics or Chemistry, or Geology, or Biology, five hours a week for two years.

Every student is expected to consult the President in regard to the details and best arrangement of her various studies, and to register her course of study in the president's office before entering upon college work.

The studies leading to the degree of Bachelor of Arts, may, as a rule, be taken in any order preferred by the student, but students are advised to plan their work carefully in advance with reference to the lecture schedule in order that a conflict of hours may not later in their course prevent them from electing all the studies which they desire. Students who elect English as a major study, for example, must take the general English literature lectures and essay work in their first and second years in the college because they are required to have completed this work before entering the major course in English; again, a student choosing philosophy as one of her major studies must take the general course in philosophy in her first year if she wishes to elect post-major work in philosophy. Students choosing a scientific group, such as chemistry and biology, must arrange their courses so as to avoid conflicts in the hours for laboratory work. Trigonometry is required for the work of the minor course in mathematics and for the work of the major year of the group course in physics.

Those students who have not decided on their group may in the first year pursue required studies only, or may elect one of the courses belonging to the group to which they most incline, with the understanding that if they should desire to change their group that course will be counted as a free elective; those students whose tastes are already fully formed, or who are uncertain how many years they shall remain in college, may enter at once on free elective studies and on the study of both subjects of their group. There are obvious advantages for the student in deferring as long as possible the choice of her free electives and her group, inasmuch as the required studies, by accustoming her to the methods of laboratory work, and to the

Math Specializ. | major course in math 20 hr  
 | " " " related area 20 hr  
 40 hr

M

study of languages, literature, and history, afford her every opportunity of ascertaining her true tastes and aptitudes.

The students are not divided into the traditional college classes, and there is no limit of time for graduation; in order to pursue a wider course of reading in connection with single subjects, or to attend a greater variety of lectures, the ablest students may choose to defer graduation; personal considerations only determine the time spent in completing the studies required for a degree. Nevertheless, these requirements constitute strictly a four years' course; that is to say, if the time given to lectures and class work be, as is usual, fifteen hours a week, a student passing the ordinary matriculation examination, and availing herself of the preliminary courses of the college in the subjects which that examination did not include, in all cases requires precisely four years. To reduce the length of the college course or to give more time for advanced studies students are permitted to take examinations in certain subjects included in the course without attending the college classes. Trigonometry, the fourth language (Matriculation French, or German, or Greek, or Minor Latin) and the reading and composition courses in French and German may be taken in this way. It is impossible for a student to reduce the length of the college course by one year unless she enters with knowledge considerably in advance of that required by the entrance examinations; otherwise the extra work is too much to be accomplished during the summer vacations.

*The Bryn Mawr European Fellowship.*

The Bryn Mawr European Fellowship is awarded annually to a member of the graduating class of Bryn Mawr College on the ground of excellence in scholarship. The holder receives the sum of five hundred dollars, applicable to the expenses of one year's study and residence at some foreign university, English or Continental. The choice of a university may be determined by the holder's own preference, subject to the approval of the Faculty.

*Studies Leading to a Second Degree.*

Graduates of Bryn Mawr College, and graduates of other colleges who shall have satisfied the Academic Council that the course of study for which they have received a degree is equivalent to that for which the degree of Bachelor of Arts is given by Bryn Mawr College, or who shall have attended such additional courses of lectures as may be prescribed, may apply to the Aca-

demical Council to be enrolled as candidates for the degree of Doctor of Philosophy and Master of Arts; admission to the graduate school does not in itself qualify a student to become a candidate for this degree. A separate degree of Master of Arts is open to graduates of Bryn Mawr College, but to them only.

The candidate for the degree of Master of Arts must be a Bachelor of Arts of Bryn Mawr College, must have studied at Bryn Mawr College for at least one year after receiving this degree, and must have pursued either undergraduate courses not previously taken, amounting to ten hours a week, or graduate courses equivalent in time value to ten hours a week of undergraduate work. She may have devoted herself exclusively to a single subject, and must have taken in some one subject the equivalent of a five-hour course. If the courses taken are undergraduate courses, the student must pass the usual examinations with credit; if they are graduate, she must pass either a written examination, or an oral examination in the presence of the members of the Faculty, as may be preferred by the heads of the departments in which she has studied.

The degree of Doctor of Philosophy and Master of Arts may be conferred upon graduates of Bryn Mawr College, and upon graduates of other colleges who shall have satisfied the Academic Council either that the course of study for which they received a degree is equivalent to that for which the degree of Bachelor of Arts is given by Bryn Mawr College, or that it has been adequately supplemented by subsequent study.

The candidate must have pursued, for at least three years after having received the first degree, a course of liberal (non-professional) study at some college or university approved by the Academic Council, and must have spent at least two of these years at Bryn Mawr College. She must have written, on some subject connected with her chief subject of study, a dissertation that bears satisfactory evidence of original research, and must pass an oral examination in the presence of the members of the Faculty on one major or chief subject, and a written and an oral examination on two minor subjects. In special cases where one minor subject is substituted for the two minor or secondary subjects, the time spent on the one secondary subject must be equal to the time usually spent on the two minor subjects, and every

*The Degree of Master of Arts.*

*The Degree of Doctor of Philosophy and Master of Arts.*

various important excavations of modern times are also described. Incidentally the history of Greek architecture is studied, chiefly with reference to the development of the temple. Ability to read easily both French and German is practically essential.

## GRADUATE COURSES.

**Graduate Courses.**

Archæology, Dr. Hoppin.

*Two hours a week throughout the year.**(Given in each year.)*

This course is designed as a general introduction to the study of classical archæology for graduate students who have had no previous training in the subject, but have already studied Greek and Latin and are fitted to make rapid progress. Ability to read easily Greek, Latin, French, and German is essential. The scope of the course is determined by the needs of the students electing it.

Archæological Seminary, Dr. Hoppin.

*Two hours a week throughout the year.**(Given in each year.)*

This course is open only to graduate students who have taken the course in the Elements of Archæology, or have done equivalent work. Ability to read easily both French and German is indispensable. Various archæological problems are thoroughly discussed and a certain amount of individual research work is required of each student. Instruction is given mainly by conferences and talks of an informal nature. Papers are read and criticised at each meeting of the class.

**Mathematics.**

The instruction in this department is under the direction of Dr. Charlotte Angas Scott, Professor of Mathematics, Mr. Joseph Edmund Wright, Associate in Mathematics, and Dr. Isabel Maddison, Reader in Mathematics. The instruction offered in mathematics covers twenty-one hours of lectures and recitations a week, in addition to the time devoted to the seminary work in the graduate department; it includes two hours a week for one semester of a preparatory course in trigonometry, ten hours a week of undergraduate minor and major work, one hour a week of free elective work, five hours a week of post-major work open only to graduates and to undergraduates who have completed the major course in mathematics, and four hours a week of graduate work.

In the major course the students are able to gain a fair knowledge of the principal subjects belonging to the department of pure mathematics. The points of contact of mathematics with other branches of mental and physical science are indicated as far as possible throughout the course, special attention being paid to the nature of mathematical reasoning, and to the true relation and mutual dependence of mathematics and physics. The course of lectures on the history of mathematics in the second year is intended to give an outline of the development of the subject from its beginning to 1700 A. D.

Bryn Mawr 1904-05

A course in trigonometry of two hours a week throughout the first semester of each year is offered by Mr. Wright. This course may be taken either as a free elective or may be counted, by students who have completed the mathematical group, as part of the year of mathematics which may be taken as an alternative for the second year of required science. A knowledge of elementary trigonometry is necessary for students entering the minor course in mathematics, and those who do not elect the course must pass the examination for advanced standing before admission to the minor course in mathematics.

**Preparatory Course.**

## FIRST YEAR.

*(Minor Course.)***1st Semester.**Analytical Conics and Theory of Equations, Dr. Scott. *Five hours a week.***2nd Semester.***First Half.*—Algebra and advanced Trigonometry, Mr. Wright.*Five hours a week.**Second Half.*—Elementary Differential and Integral Calculus, Mr. Wright.*Five hours a week.*

## SECOND YEAR.

**1st Semester.**Differential and Integral Calculus, Differential Equations and Theory of Equations, Mr. Wright. *Five hours a week.***2nd Semester.**Analytical Geometry of two and three Dimensions, Curve Tracing, Dr. Scott. *Four hours a week.*

History of Mathematics (about sixteen lectures), Dr. Scott.

*One hour a week.*

*Group:* Mathematics with Greek, or with Latin, or with Philosophy, or with Physics, or with Chemistry, or with Geology.

## FREE ELECTIVE COURSES.

Fundamental Theorems of Algebra and Geometry, Dr. Scott.

*One hour a week throughout the year.**(Given in 1903-04.)*

This course is offered in alternate years. Certain standard problems of historical interest are considered in order to elucidate some of the fundamental principles of mathematics. Either semester may be taken separately. No knowledge of mathematics beyond the requirements for matriculation is presupposed. It is hoped that the work will prove useful not only to students electing mathematics as a major, but also to those intending to teach elementary mathematics. It may be taken as a free elective and may be combined by students who have completed the mathematical group with post-major mathematics to make up the year of mathematics which may be taken as an alternative for the second year of required science.

Geometrical Conics, Dr. Scott. *Two hours a week during the second semester.**(Given in 1904-05.)*

This course may be taken as a free elective or may be combined with the course in trigonometry given in the first semester to form a course of two hours a week throughout

**Major Course.**

the year, and may be combined by students who have completed the mathematical group with post-major mathematics to make up the year of mathematics which may be taken as an alternative for the second year of required science.

## POST-MAJOR COURSES.

## Post-Major Courses.

The post-major courses in mathematics are designed to bridge over the interval between the ordinary undergraduate studies and advanced work. They deal, therefore, with the subjects of the major course, carried to higher developments and treated by higher methods. As the order of mathematical studies differs in different colleges, graduate students frequently find it advisable to devote a part of their time to these courses. Regular written work is expected from all mathematical students, and a reading knowledge of French and German is presupposed.

The post-major courses in any one year amount to five hours a week. The courses given are the following, with occasional modifications:

I. (a.) Lectures Introductory to Modern Analytical Geometry, in connection with Salmon's *Conic Sections* and Scott's *Modern Analytical Geometry*, Dr. Scott.

or, I. (b.) Lectures on Modern Pure Geometry, Dr. Scott.

or, I. (c.) Lectures on Special Topics in Geometry, such as Homogeneous Coordinates, Circular Coordinates, Families of Curves, Certain Transcendental Curves, Geometrical Transformations, etc., Dr. Scott.

Special permission to take this course before completing the two years of the major course may be granted to students whose work in the major course has shown that they are able to profit by the lectures.

II. (a.) Lectures Introductory to Modern Algebra, in connection with Salmon's *Modern Higher Algebra*, and Elliott's *Algebra of Quantics*, Mr. Wright.

or, II. (b.) Lectures preparatory to the Theory of Functions, in connection with Harkness and Morley's *Introduction to the Theory of Analytic Functions* and Chrystal's *Algebra*, Vol. II, Mr. Wright.

or, II. (c.) Lectures on Differential Equations, ordinary and partial, Mr. Wright.

or, II. (d.) A general course in Analysis, dealing with the higher development of subjects only touched upon in the major course, such as Determinants, Fourier's Series, Infinite Series, Definite Integrals, etc., Mr. Wright.

III. (a.) Lectures on Analytical Geometry of Three Dimensions, Dr. Maddison.

or, III. (b.) A practical course in Differential Equations, Dr. Maddison.

or, III. (c.) Lectures on the Theory of Envelopes, Dr. Maddison.

In 1903-04 the following post-major courses are offered:

I. (a.) Dr. Scott. *Two hours a week throughout the year.*

II. (d.) Mr. Wright. *Two hours a week throughout the year.*

III. (a.) Dr. Maddison. *One hour a week throughout the year.*

In 1904-05 the following post-major courses will be offered:

I. (b.) Dr. Scott. *Two hours a week throughout the year.*

II. (c.) Mr. Wright. *Two hours a week throughout the year.*

III. (a.) Dr. Maddison. *One hour a week throughout the year.*

## GRADUATE COURSES.

## Graduate Courses.

The graduate courses consist of lectures and seminary work, supplemented by private reading under the direction of the instructors, the courses being arranged each year with reference to the wishes and degree of preparation of the students concerned.

No undergraduates are admitted to graduate courses.

Theory of Plane Algebraic Curves, general course, Dr. Scott.

*Two hours a week throughout the year.*

(Given in 1903-04.)

No knowledge of the subject is presupposed, but familiarity with the use of homogeneous point and line coordinates is necessary. The lectures deal with the general theory of plane algebraic curves and their point and line singularities and with some of the special properties of cubic and quartic curves.

Theory of Plane Algebraic Curves, Transformation, and Geometry on a Curve, Dr. Scott.

*Two hours a week throughout the year.*

(Given in 1904-05.)

This course is a detailed discussion of some parts of the theory of plane algebraic curves, in which a general knowledge of the subject is presupposed. During the first semester special attention is paid to the theory of algebraic transformations. The second semester is devoted to the treatment of groups of points and systems of curves.

Theory of Differential Equations, Mr. Wright.

*Two hours a week throughout the year.*

(Given in 1903-04.)

This course is designed to develop the theory of differential equations from the point of view of Lie's Group Theory. The first semester is taken up by the consideration of those properties of groups which are necessary to the subject, and their application to ordinary equations of the first order. The second semester is spent in a discussion of ordinary differential equations of higher order and of partial differential equations.

Theory of Continuous Groups, Mr. Wright.

*Two hours a week throughout the year.*

(Given in 1904-05.)

The theory of continuous groups will be discussed as developed by Lie. The following course may be substituted for this by request.

Algebraic Functions, Mr. Wright. *Two hours a week throughout the year.*

(Given in 1905-06.)

This course consists of a detailed study of algebraic functions, including Abel's Theorem and Abelian functions.

Journal Club, Dr. Scott and Mr. Wright.

*One hour a fortnight throughout the year.*

The Mathematical Journal Club holds fortnightly meetings during a part of the year at which reports on special topics or memoirs are presented by the instructors and the graduate students.

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