

No. 635.

PROSPECTUS OF EVENING CONTINUATION CLASSES.

Supervisory Committee :

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Organizing Secretary :

W. H. WILLIAMS, Esq.

*Date of Commencement of First Session.***WEDNESDAY, 3rd October, 1906.**

1. **Object of Classes.**—Evening classes in Technical subjects will be established at Queen's College for the purpose of affording facilities for a commercial and scientific training to students generally, and of enabling those who have left school to continue their studies.

2. **Subjects of Instruction.**—The classes will be conducted under three sections. The subjects taught will be as follows:—

(a.) **COMMERCE SECTION:**—Pitman's Shorthand, Book-keeping, Commercial Geography, Commercial Arithmetic, Modern Languages, Letter Writing and Advanced English.

(b.) **ENGINEERING SECTION:**—Practical Mathematics, Applied Mechanics and Mechanical Drawing.

(c.) **SCIENCE SECTION:**—Chemistry, Electricity, Heat and Steam, and Hygiene.

Full particulars relating to the different courses of study are given in Appendix A, but the Syllabus is liable to alteration from time to time as found desirable.

No class will be formed unless at least five students join.

During the first week of the Autumn Session all the teachers will be in attendance from 6 p.m. to 8 p.m., and students are advised to consult them before entering their names for any class.

3. **Sessions and Time Table.**—There will be two Sessions in the year—the first commencing in the first week of October, and closing two weeks before Chinese New Year, the second commencing two weeks after Chinese New Year and closing in the last week of May.

Classes will be held on Monday, Tuesday, Wednesday, Thursday and Friday evenings from 6 p.m. to 8 p.m., or at such other times as may be approved. A Time Table shewing when and where different classes will be held, is given in Appendix B.

4. **Conditions of Admission.**—The classes are open to all who are over 14 years of age, irrespective of nationality, but applicants under 17 years of age must produce satisfactory references.

Students are admitted at any time during the Session.

Applications for admission must be made on printed forms and signed by the applicant. These forms can be obtained by personal application at the College on Class nights.

Pupils in attendance at a Day School will not be admitted except with the approval of the headmaster of the school.

5. Fees.—

- (a.) **REGISTRATION FEE** :—Students attending the classes will be required to pay a Registration Fee of five dollars (\$5) on admission. At the close of the year the whole of the fee will be returned to any student whose conduct and progress are reported as satisfactory by the class-master, if the number of his attendances equals 90 per cent. of the possible number of attendances in the classes that he has joined; half the fee will be returned if the number equals 75 per cent. No registration fee will be charged students who continue their course of study for a second year.
- (b.) **CLASS FEES** :—A fee of one dollar a month will be charged for the first class, and one of 50 cents a month for each additional class.
- (c.) **APPARATUS FEE** :—In the Engineering and Science classes a deposit not exceeding three dollars must be made by students who have the use of any instruments or apparatus of value. This fee will be returned to the student at the close of the year if the instruments and apparatus have received no damage at his hands.
- (d.) All fees are payable in advance.

6. Books and Stationery.—Books and stationery must be provided by the students. Students taking advanced courses will be allowed to borrow the more expensive text-books and works of reference from the Library.

7. Home-work.—Home lessons will be given out at the end of each lesson. A record of each student's home-work will be kept and the award of certain prizes will depend largely upon the home-work having been done in a satisfactory manner.

8. Examinations.—The work of each class will be examined at the end of each year and at intervals during the year, by examiners appointed by the Government or by some recognised external examining body.

The Government Examinations and those conducted by the English Board of Education will be open without fee to students attending these classes. Every assistance will be given to students who may wish to enter for the external examinations referred to in Appendix C.

9. Certificates.—Certificates will be awarded by the Government to all students who have attended the classes regularly and whose conduct and diligence have been satisfactory. The subjects which the student has been taught will be stated on the certificate.

Pitman's "Elementary", "Theory", and "Speed" Certificates will be granted to students who pass successful examinations in the subjects of Classes I, II and III respectively, of the Shorthand Course.

Appendix A.

SYLLABUS OF INSTRUCTION.

(A.)—COMMERCE SECTION.

There are eleven classes in this section, viz :—Three in Shorthand, two in Book-keeping, one in Geography, one in Commercial Arithmetic, one in Advanced English, and three in Modern Languages. The Course of Instruction for each of the eleven classes will be completed in one year.

Shorthand (Pitman's).

CLASS I.

Beginners Class,Book I—"The Teacher."

CLASS II.

Improvers Class,Book II—"The Manual."

CLASS III.

Speed Class,Book III—"The Reporter" and
"Phrase Book."

Book-keeping.

CLASS IV.

Elementary Class,For those who have no previous knowledge of the subject.

Thornton's Primer of Book-keeping;
Commercial Terms in ordinary
use; Letter Writing.

CLASS V.

Advanced Class,.....Thornton's Book-keeping by Double
Entry, Commercial Terms and
Exchange; Précis Writing; Com-
mercial Correspondence.

Commercial Geography.

CLASS VI.

This course is designed to impart a practical knowledge of the principles of Geography, and will be illustrated by lantern views.

Land relief and causal relations, Uses of Mountains and Rivers, Birth of Cities, Modes of Travelling, Transport, Winds, Currents, Rainfall, Climate, Distribution of population, animals and vegetables, The World's Markets, The World's Trade Routes, Interchange of Commodities, Map Symbols.

Commercial Arithmetic.

CLASS VII.

This class is recommended as an alternative to Classes IV and V for those who already have practical experience in Book-keeping.

Decimal Coinage, Local Currency, Exchange Problems, Chinese Money and Weights, Indian and Japanese Money and Weights, English Money and Weights, The Metric System, Partnerships, Commission, Insurance, The Compound Interest Law, Averages, Rapid Methods of Calculation, Checking of Results.

Modern Languages.

CLASS VIII.

German, for Beginners.

CLASS IX.

French, for Beginners.

CLASS X.

Japanese,..... for Beginners.

CLASS XI.

Advanced English.

Translation from and into Chinese.

No student may join this class who has not already a good knowledge of English.

(B.)—ENGINEERING SECTION.

The classes in this section are arranged to provide a two years' course in (a) the first principles of Engineering; (b) applied science; (c) practical mathematics. The classes in Practical Geometry are designed to enable students to become acquainted with the use of drawing instruments and the principles of projection as applied to mechanical drawing. The course is preparatory to the course in Machine Drawing intended for third and fourth year students.

The courses in Applied Mechanics, and Heat and Steam, are designed to give students a knowledge of the main principles applied in Engineering.

The classes in Practical Mathematics will enable students to acquire a good working knowledge of Mathematics, essential to follow the work of the allied courses in Engineering Subjects. The third and fourth years' courses in the Engineering section are included here for the purpose of indicating the course of study which a student may pursue after completing the course for the first two years, but these further courses which will necessarily involve considerable expense to the Government, will not be given unless the number of students who have completed the first two years' course, is considered sufficient to justify this expenditure.

FIRST YEAR'S COURSE.**CLASS I.****Practical Mathematics.**

1. Arithmetic.—The use of decimals; the fallacy of retaining more figures than are necessary, especially in calculations involving numbers which represent observed or measured quantities; contracted and approximate methods of multiplying and dividing numbers; using rough checks in arithmetical work.

Simplification of fractions; calculation of percentages expressing shillings and pence as decimals of a pound, quarters and pounds as decimals of a hundredweight, etc.

2. Algebra.—The use of formulæ when numeral values are given for the various quantities; Rules of Indices; problems leading to easy equations in one or two unknowns; easy transformations and simplifications of formulæ, and in easy cases, finding any one of several quantities in a formula when the others are given; practice in algebraic manipulation generally; the determination of the numeral values of constants in equations of known form, when particular values of the variables are given; the meaning of the expression "A varies as B"; factors.

3. Trigonometry.—Measurement of angles; meaning of sine, cosine, tangent; verifying simple formulæ; easy solutions of triangles.

CLASS II.**Practical Geometry.**

Plane Geometry.—The use of scales; the construction and measurement of angles in degrees and radians by the use of a protractor or scale of chords; proportional division of lines, and other illustrations of the propositions of the sixth book of Euclid; the construction of triangles, polygons, and other plane figures; reduction and enlargement of figures.

CLASS III.**Mechanics.**

The course of instruction will consist of a practical demonstration of the first principles of Mechanics. Students will be given the opportunity of carrying out the experiments for themselves.

The lever; parallelogram and triangle of forces; centre of gravity of various solids; units of force, work, energy, power; specific gravities of solids and fluids; Archimedes' principle; the hydrometer.

SECOND YEAR'S COURSE.

CLASS IV.

1. Arithmetic.—Revision of Decimals; Approximations; Metric System.

2. Algebra.—The meaning of a common logarithm; the use of logarithms in calculations involving multiplication, division, involution and evolution; calculation of numeral values from formulae, however complex.

The principle underlying the construction and method of using a common slide rule; the use of a slide rule in making calculations; conversion of common logarithms into Napierian logarithms; the calculation of square-roots by the ordinary arithmetical method; using algebraic formulae in working.

3. Mensuration.—The rule for the length of the circumference of a circle; the rules for the areas of a triangle, parallelogram, circle; areas of the surfaces of a right circular cylinder, right circular cone, sphere, circular anchor ring; the determination of the area of an irregular plane figure (1) by using Simpson's or other well-known rules for the case where a number of equidistant ordinates or widths are given; (2) by the use of squared paper whether the given ordinates or widths are equidistant or not, the "mid-ordinate rule" being used; determination of volumes of a prism or cylinder, cone, sphere, circular anchor ring; determination of the volume of an irregular solid by each of the two methods for an irregular area, the process being first to obtain an irregular plane figure in which the varying ordinates or widths represent the varying cross sections of the solid; some practical methods of finding areas and volumes; determination of weights from volumes when densities are given; stating a mensuration rule as an algebraic formula.

4. Use of Squared Paper.—The use of squared paper; plotting of statistics of any kind whatsoever, of general or special interest; what such curves teach; rates of increase; interpolation, or the finding of probable intermediate values; probable errors of observation; the calculation of a table of logarithms; finding an average value; areas and volumes; the method of fixing the position of a point in a plane; the x and y , and also the r and θ co-ordinates of a point; plotting of functions such as $y=ax^n$ $y=ae^{bx}$ where a , b , n may have all sorts of values; the straight line; meaning of its slope, slope of a curve at any point on it.

CLASS V.

Practical Geometry.

Plane Geometry.—The construction and measurement of angles; the construction and use of tables of sines, cosines, and tangents of angles; areas of plane surfaces determined graphically; the location of points by rectangular co-ordinates; construction relating to lines and circles; geometrical loci applied to motion of machine parts; scalar and vector quantities; graphic representation of velocities and forces; the triangle, parallelogram and polygon of velocities and forces.

Solid Geometry.—Projection of points, lines and planes, horizontal projection, figured planes, and scale of slope; the inclined and oblique plane, with rabatment of contained figures; plan and elevation of plane figures and simple solids; sections of solids by vertical and horizontal planes.

CLASS VI.

Applied Mechanics.

Force, work, energy, and power; use of squared paper; elementary principles of graphical statics; laws of work and friction; efficiency of machines; law of a machine; communication of power by shafting and wheels; belt, rope, and chain driving; dynamometers; reversing motions, quick returns, cams, etc.; elementary principles of force and motion as applied to rotating bodies; steadiness of machines; force of a blow; extension and compression of materials; strength of boilers; riveted joints; twisting of a shaft and bending of a beam; stiffness and strength of loaded beams; loaded arch; properties of materials used in construction; stiffness and strength of springs; elementary principles of hydraulics.

THIRD YEAR'S COURSE.

Practical Mathematics.

1. Algebra—Summation of Series, Indices, Binomial Theorem, Solution of Equations by formulæ after establishing formula, Limits, Graphs of Functions.

2. Trigonometry.—Study of such limits as $\sin \theta \div \theta$; how to find the values of the sine, cosine, and tangent, for angles greater than 90° ; complementary and supplementary angles; how the value of π is determined.

The fundamental formulæ of trigonometry; the sine rule in triangles; the rule $c^2 = a^2 + b^2 - 2 ab \cos c$; the expression for the area of a triangle, having given two sides and the included angle.

Solution of triangles, Functions, Transformation of Products and Sums, Establishing formulæ, Solution of Triangles with Logarithms, Heights and Distances, Inverse Functions, Approximations, Graphs, Maxima and Minima, Applications of Trigonometry.

3. Introduction to the Differential and Integral Calculus.—Rate of increase of one quantity relatively to that of another; approximate methods of calculating a rate of increase, as for example, in the case where simultaneous values of two varying quantities have been observed experimentally, or by finding the slope of the curve obtained by plotting such values.

The term “differential co-efficient”, as applied to a rate of increase, and the symbol for it, namely $\frac{dy}{dx}$ where y and x represent the two varying quantities.

4. Mensuration.—Solids, Approximate Determinations, Metric Measures, Plane Figures.

5. Squared Paper.—Determination of maximum and minimum values; the solution of equations; the roots of equations may be obtained by the use of squared paper; rates of increase; speed of a body; determination of laws which exist between observed quantities, especially linear laws. Corrections for errors of observation, when the plotted quantities are the results of experiment.

Machine Drawing.

A lecture of half-an-hour's duration will be given each evening upon the forms and construction of various machine and engine parts. The students will make dimensioned sketches of the details illustrated on the blackboard, or from the actual objects shown during the lectures, and the remaining time will be devoted to making full size or scale drawings from the sketches.

The examples will include:—Bolts, nuts, and set screws; pins, keys, and cotters; shafting, couplings, and clutches; rivets and rivetted joints, pedestals and footsteps; toothed wheel gearing; pulleys and wheel cones; cranks and eccentrics; connecting rods, cross heads, pistons, stuffing boxes and glands; pipe joints, various valves and cocks, engine cylinder and slide valves.

Applied Mechanics.

The subjects mentioned in the elementary course will be treated more fully, together with the following:—

Friction.—Rolling friction, brakes, holding power of coiled ropes, slipping of a belt.

Strength of Materials.—Transverse strain on timber beam, girders, cantilevers, deflection of beams. Combined bending and twisting; combined bending and crushing; struts.

Graphical Statics.—Examples of framework, with diagrams of stress, lattice girders and roofs. Finding moments of inertia of areas. Lines of resistance. Bending moment and shearing force diagrams.

FOURTH YEAR'S COURSE.

Practical Mathematics.

Elements of the Calculus.—Rules for finding the differential co-efficient of y with respect to x , that is $\frac{dy}{dx}$ when y and x are related in the following ways:—

$$y = ax^n; y = ac; y = \sin x; y = \cos x;$$

$$y = \sin (bx + c); y = A \log (x + a).$$

First Principles of Co-ordinate Geometry.

The following graphs, $y = a + bx$; $y = a + bx + cx^2$; $yx^c = b$; $y = a^{bx}$; $y = ba \sin (bx + c)$.

The idea of limits.

Interpretation of symbols $\frac{dy}{dx}$ and $\int x^m dx$ and their graphic representation.

Study of x^n . Maxima and Minima.

Partial differentiations.

Areas of curves.

Moment of inertia.

Definite Integrals.

Applied Mechanics.

Motion and Energy, their applications. Graphic Statics and their application to roofs, cranes, beams, girders and bridges. Hydraulics.

(C.)—SCIENCE SECTION.

There are four classes in this section—one in each of the following subjects:—Chemistry, Electricity, Heat and Steam, and Hygiene. On completion of the First Year's course, arrangements will be made for instruction in the advanced stages of each science, if the number of students and the standard already attained justify the formation of advanced classes.

CLASS I.

Chemistry.

This course is designed for those who have no previous knowledge of the subject, and will be completed in one year.

An elementary knowledge of the Science is required by all who wish to study metallurgy, electricity, botany, &c. The course covers nearly all that is required in Chemistry for the Elementary Science of the Matriculation of the University of London, the Minor Examination of the Pharmaceutical Society and the Board of Education Examinations in Chemistry.

The Metric system of weights and measures; specific gravity; the investigation of the composition of common chalk and other well known substances; conditions of chemical action; solutions and solubility; the property of the common acids and bases; oxides; neutralisation; formation and decomposition of salts; formulæ; equations; oxidation and reduction; general properties of gases; the atmosphere; combustion; flame. Non-metals and metals. The preparation and properties of the following elements and compounds:—Oxygen, hydrogen, water; chlorine, bromine, iodine, hydrochloric acid; nitrous and nitric oxide, ammonia; carbon, carbon monoxide, carbon dioxide, acetylene, carbon disulphide, alcohol, acetic acid; sulphur, hydrogen sulphide, sulphur dioxide, sulphur chloride, sulphuric acid; phosphorus.

There will be laboratory work in this class arranged so as to illustrate the subject matter of the lectures.

CLASS II.

Electricity.

The lectures will be illustrated by experiments and will deal with the following:—Magnets and magnetic substances; magnetisation and magnetic induction; the earth's magnetism; the electric current—its effects and methods of measurement; battery cells; induction of current electricity—its laws and its relation to current electricity.

Students are strongly advised to spend one evening in the Junior Electrical Laboratory, where they will have the opportunity of repeating the lecture demonstrations, and of performing simple experiments.

CLASS III.

Heat and Steam.

Consideration of the properties of heat; the temperature of a body and measurement of same by thermometers; the measurement of quantities of heat; latent heat; heat required for the formation of steam under varying conditions; heat produced by the combustion of coal; the application of steam; jet and surface condensers, quantity of water required for condensation, air pumps, boiler feed pumps; steam boilers and their appendages, the indicator and indicator diagrams; the injector.

CLASS IV.

Hygiene.

This course is intended more particularly for the benefit of Chinese teachers in Anglo-Chinese Schools.

The "Second Stage Hygiene" prescribed for the Examination of the Board of Education. Outlines of human Physiology. Sanitation, with special reference to local conditions. First Aid Principles. The lectures will be illustrated by experiments.

Appendix B.**TIME TABLE OF CLASSES.**

SECTION.	SUBJECT.	CLASS.	TIME.	No. OF ROOM.
Commerce.	Shorthand,	I, II, III,	Monday and Wednesday, at 6 p.m.,	4
	Book-keeping,	IV and V,	Tuesday, at 6 p.m.,	15
	Geography,	VI,	Wednesday, at 7 p.m.,	15
	Arithmetic,	VII,	Monday, at 7 p.m.,	4
	German,	VIII,	Tuesday and Thursday, at 7 p.m.,	8
	French,	IX,	Do., at 6 ,,	8
	Japanese,	X,	Do., at 6 ,,	9
Engineering.	English,	XI,	Monday, Wednesday and Friday, at 6 p.m.,	8
	Mathematics,	I,	Monday, Tuesday and Thursday, at 6 p.m.,	22
	Geometry,	II,	Monday and Thursday, at 7 p.m.,	22
	Applied Mechanics,	III,	Tuesday, at 7 p.m., and Friday, at 6 p.m.,	22
	Mathematics,	IV,	} By arrangement.	
	Geometry,	V,		
Science.	Applied Mechanics,	VI,		
	Chemistry,	I,	Thursday and Friday, at 6 p.m.,	7
	Electricity,	II,	Do., at 7 ,,	7
	Heat and Steam,	III,	Friday, at 7 p.m.,	9
	Hygiene,	IV,	Do., at 6 ,,	15

Notice will be given of any alteration.

Appendix C.

INFORMATION RELATING TO EXTERNAL EXAMINATIONS.

LONDON UNIVERSITY DEGREES.**General Information.**

The Matriculation Examination is a necessary preliminary to graduation in any Faculty—Science, Arts, Divinity, Medicine, Laws, or Music—except in the case of graduates of British Universities and holders of certain other diplomas. The method of preparation both for Matriculation and for degrees in any Faculty except Medicine, is left entirely to the candidate's choice; neither residence at a college nor attendance at lectures is required. All the examinations and degrees of the University are open to men and women alike. Arrangements have been made by which degrees may be obtained in all parts of the Empire, and it is now possible for a student in this Colony to obtain some of the degrees by examinations conducted entirely in the Colony.

If he passes the requisite examinations, a candidate can in his own Colony obtain the degree of Bachelor of Divinity (B.D.), Bachelor of Arts (B.A.), Bachelor of Laws (L.L.B.), Bachelor of Science (B.Sc.). The first examination to be passed towards the attainment of a degree is that of Matriculation. The syllabus of the subjects required for a pass is given below and the candidate must choose in accordance with the Regulations, the subjects in which he wishes to be examined.

Two more examinations must be passed after Matriculation before the student can obtain a Bachelor's Degree. These are called the Intermediate and Bachelor's Degree Examinations respectively.

Arrangements for the Matriculation Examination.

The Matriculation Examination is held twice a year simultaneously in England and in the Colonies, in January and June.

When the time approaches at which the candidate is ready to present himself for examination, application must be made by the candidate or by his teacher to the Colonial Authorities, for the Examination to be held in the Colony. As the preliminary arrangements take considerable time, very early notice should be given.

The procedure with regard to entry for the Intermediate and Final Examinations is in all respects the same as that for the Matriculation Examination.

Privileges and Exemptions.

The following public bodies accept the Matriculation Examination as an approved preliminary Examination:—The Incorporated Law Society, the Royal Institute of British Architects, the Pharmaceutical Society, the Institute of Chemistry of Great Britain and Ireland, the Institute of Civil Engineers (for Studentship and Associate Membership).

Those who wish to enter the teaching profession should note that the Board of Education recognise persons over 18 years of age who have passed this examination, as "Uncertificated Teachers" (Code of Regulations for Day Schools); and permit their admission to a training College without further Examination (Regulations for Training of Teachers).

Syllabus for Matriculation.

Six papers are set to each candidate at Matriculation.

Three of these—one in English and two in Elementary Mathematics—are obligatory on all. The other three are to be chosen by the candidate from the following list:—

Latin, Greek, French, German, Arabic, Sanskrit, Spanish, Portuguese, Italian, Hebrew, Ancient History, *either* Modern History *or* History and Geography, Logic, *either* Physical and General Geography *or* History and Geography. More advanced Mathematics, Mechanics, Chemistry, Heat, Light and Sound, Electricity and Magnetism, Botany, Zoology.

It is provided that one of the subjects so selected shall be a language, and if that language is not Latin, one of the selected subjects must be either Mechanics, or Chemistry, or Heat, Light and Sound, or Botany. It is thus possible to pass without offering any branch of science, but in that case Latin must be offered.

BOARD OF EDUCATION.

The Board of Education holds its examination in various mathematical, science, and art subjects during the months of April, May, and June of each year. The subjects are divided into three stages—Elementary, Advanced and Honours—and the Board grants certificates to students who pass in any one of the stages. These certificates do not carry exemption from any of the University Matriculation Examinations, but they are recognised by all firms in which a technical knowledge of chemistry, physics, or drawing is required.

Arrangements can be made for holding these examinations in Hongkong. The dates of the Examinations will be posted in the hall of the College, and intending candidates will be given due notice of the regulations. Candidates will be charged a local fee not exceeding two dollars for each subject in which they desire to be examined. A list of all the subjects in which the Board holds examinations, and the syllabus of Stage 1 in Building Construction and Drawing are given below. Full particulars of the scope of the Examination in any subject may be obtained on application to the Organizing Secretary.

Science Subjects.—Practical Geometry; Machine Construction and Drawing; Building Construction and Drawing; Naval Architecture; Mathematics; Theoretical Mechanics; Applied Mechanics; Sound, Light, and Heat; Magnetism and Electricity; Inorganic Chemistry; Organic Chemistry; Geology; Mineralogy; Human Physiology; General Biology; Zoology; Botany; Mining; Metallurgy; Navigation; Astronomy; Steam; Physiography; Agriculture; Hygiene; General Elementary Science.

Art Subjects.—Freehand Drawing; Model Drawing; Drawing in Light and Shade from a cast; Drawing on the Blackboard; Geometrical Drawing; Perspective.

BUILDING CONSTRUCTION AND DRAWING.—STAGE I.

Descriptive and explanatory drawings. Freehand drawings of details from which a neat dimensioned sketch may be made. The use of squared paper. The various materials used in building; the nature and properties of sand, lime, and cement; the composition of mortar or concrete and its application in floors, walls, etc.; the properties of bricks, stones, tiles, and slates; timber; cast iron, wrought-iron, and steel. Foundations, footings; scaffolding; plain walling flues, arches, fire-places; simple masonry; plain carpentry in floor joists, stud partitions, ordinary roofs; plastering; slating; plain tiling; simple glazing; to draw the sections of rolled joists, channels, angles and trees.

T. SERCOMBE SMITH,
Colonial Secretary.

27th July, 1906.