
Prospectus: Kevin Street

Kevin Street College

1912-9

City of Dublin, Municipal Technical Schools, Kevin Street; Prospectus, 1912-1913

City of Dublin Technical Schools

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CITY OF DUBLIN

TECHNICAL SCHOOLS.

PROSPECTUS

FOR THE
SESSION

1912-1913.



Complimentary.

City of Dublin
MUNICIPAL
Technical Schools



Offices—LOWER KEVIN STREET.

PROSPECTUS,



SESSION 1912-1913.

SEALY, BRYERS & WALKER,

ABBAY STREET, DUBLIN

OPENING PROCEDURE IN 1912.

The Session will open on Tuesday, SEPTEMBER 17TH.

REGISTRATION WEEK.—September 18, 19, and 20.

During these days, representative Teachers will be at Bolton Street and Kevin Street to advise applicants, and to register as "Technical Students" all those who bring written evidence of their fitness to join any of the Technical Courses, and those who are on the Department List. Persons so registered *may* purchase their Tickets the same evening, and *should* purchase them before October 15th.

Candidates for *Free Admission* must put in their claims and obtain their Tickets, before September 28th.

EXAMINATIONS.—September, 18, 19, 20, 23, 24, 25, 26, 27, and 30.

On the nights of September 18, 19, 20, 23, 24, 25, 26, 27, and 30, Entrance Examinations will be held in the new Technical School at Bolton Street. All Students, New and Old, who cannot be registered on evidence as above, and are not on the Department List, should sit for this Examination, which is a good test of Elementary School knowledge. The majority of Applicants cannot produce documentary proof of their educational standard, and for these the Examination affords a simple and easy way of establishing their fitness. The results of each Evening's Examination will be put up for inspection in the course of a few days, after which Tickets *may* be purchased, and *should* be obtained before October 15th. A Student who fails to do himself justice on the first night may sit again on one other night only.

CLASS WEEK.—September 23.

Teachers may be consulted on their special class nights. The Schools at Rutland Square and Chatham Row open. During this week all Teachers are to form their Classes.

On September 23rd will commence the general issue of Tickets to all-comers, provided there be room in the Classes. None but Qualified Students will be eligible to take up the Courses, and these should purchase their Tickets before October 15th. Tickets will be obtainable at Bolton Street and at Kevin Street on September 18, 19, and 20.

From September 23rd Tickets will be obtainable at Chatham Row and at Rutland Square.

The School of Music opens at Chatham Row on September 30th.

CITY OF DUBLIN

MUNICIPAL

Technical Schools.

BOLTON STREET.

Engineering Classes.

Building Classes.

Printing Classes.

Commercial Classes.

LOWER KEVIN STREET.

Science, Art, and Technological Classes

Domestic Economy Classes.

RUTLAND SQUARE (No. 12).

Domestic Economy Classes.

CHATHAM ROW.

Domestic Economy Classes.

School of Music.

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TECHNICAL EDUCATION COMMITTEE

FOR THE

COUNTY BOROUGH OF DUBLIN.

Chairman Very Rev. T. A. FINLAY, S.J., M.A.
 Deputy-Chairman .. Alderman J. J. FARRELL.

The Right Hon. Councillor L. G. SHERLOCK, LL.D., Lord Mayor.

Alderman DOYLE.	✓	Councillor MAHON.	
„ HEALY, J.P.	✓	„ MONKS.	✓
„ WILLIAM O'CONNOR.		„ D. A. QUAID.	✓
Councillor J. N. M. C. BRISCOE.		„ SHORTALL.	✓
„ COGAN.		„ SWAINE.	✓
„ DERWIN.	✓	„ VAUGHAN.	
„ DICKSON.	✓		

(Representatives of the Municipal Council).

Mr. THOMAS MURPHY, Mr. GEORGE LEAHY and Mr. HENRY
 ROCHFORD.

(Representatives of the Dublin Trades).

Mr. MICHAEL NUGENT and Mr. GEORGE PERRY, J.P.
 (Representatives of the Founders and Subscribers).

Professor WILLIAM BROWN, B.Sc., A.M.I.E.E.
 (Representative of the Royal College of Science, Ireland).

Mr. EDWARD GIBSON.
 (Representative of the Dublin Guild of Master Painters).

Mr. HENRY McLAUGHLIN.
 (Representative of the Master Builders' Association).

Director JOHN RYAN, M.A., LL.M., *Cambridge*;
 D.Sc., *London Univ.*, D.Sc. (Hon.)
Bristol Univ.

Secretary LOUIS ELY O'CARROLL, B.A., B.L.

SCHEME FOR TECHNICAL INSTRUCTION IN THE CITY OF DUBLIN.

*(Submitted to the Corporation and the Department in 1911,
and approved with certain conditions.)*

Technical Instruction shall be given in the City of Dublin, under the Technical Instruction Acts of 1889 and 1899.

The local authority, which is the Municipal Council, shall govern the Schools through the agency of a Standing Committee, composed partly of members of the Council and partly of non-members who shall represent educational interests in the city.

This Technical Education Committee shall for the present consist of 26 members as follows:—

The Lord Mayor of Dublin for the time being.

Fifteen members of the Municipal Council selected by the Council.

Ten educational representatives appointed by the Council on the nomination of the following Public Bodies:—

The National University of Ireland (1).

Trinity College (1).

The Royal College of Science (1).

The Association of Master Builders (1).

The Guild of Master Painters (1).

Subscribers (2).

The Trades Council (3).

The Technical Education Committee shall make provision in the City of Dublin for the teaching in accordance with the spirit and letter of the Acts, of those branches of knowledge which seem most likely to develop the intelligence and ability of local artisans, and best calculated to promote the general interests of Industry and Commerce in the City.

In pursuance of this policy provision shall be made in the New Institute at Bolton Street for instruction in all branches of knowledge required by persons engaged in Building, in the Building Trades and the trades ancillary to Building: in Engineering of all kinds and the Engineering trades: in Printing, and in all trades concerned with the production of books, and other printed or illustrated publications. Provision shall be made at Kevin Street for instruction in Science and Art subjects of a general nature, such as are commonly taught in all Polytechnics and Technical Institutions, and in such special branches of Science and Art with their applications as may be required by any considerable body of artisans working in the City of Dublin, for whom such provision is not made elsewhere.

Provision shall be made for the teaching of Commercial subjects and such branches of knowledge as are required by students engaged in business in the City of Dublin.

For this purpose a special School shall be established in a convenient part of the City.

Provision shall be made for the teaching of Domestic Economy, both by means of Peripatetic Lecturers, who are to give such instruction in the poorer districts of the City, and by organised classes to be held in one of the buildings already possessed, or hereafter to be acquired, by the Committee.

The building at Chatham Row shall be utilised for the School of Music, and by practical classes in Instrument-making, in the manufacture and repair of clocks, watches, and kindred articles.

The Committee shall engage and appoint such officers as may seem necessary for the proper conduct of the foregoing work, and for the general government of the Schools. For these purposes an Educational Director shall be employed, with such subordinate officials as from time to time may be deemed to be necessary. The Committee shall conduct its business through, and be represented by, a Secretary, whose position, duties and responsibilities shall be similar to those of the Secretaries of other Standing Committees of the Corporation. He shall be provided with an adequate Staff. In each building a Head Teacher shall be placed in charge, and Heads of the Chief Departments shall be appointed.

For the foregoing purposes the Committee shall be supplied with Funds as follows:—

- (1.) The proceeds of a rate of a penny to be struck by the Corporation, under the Act of 1889.
- (2.) An annual subsidy to be provided by the Department under the Act of 1899, and in accordance with the provisions of that Act.
- (3.) The proceeds of an Attendance Grant to be earned and obtained from the Department.
- (4.) Fees, rents, and other payments received by the Committee for various services.
- (5.) Contributions from the public.

SCHEME OF EXAMINATIONS BY THE DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION.

The Department will commence to hold Examinations in Ireland in May, 1913. These Examinations are intended to test the progress of students in specific Courses of Study, and no advantage will be gained by a student who passes in a single subject taken by itself. For the present, these Examinations will be limited to seven Courses of Study, which are:—

Mechanical Engineering,
Electrical Engineering,
Building Trades,
Applied Chemistry,
Art,
Commerce,
Domestic Economy.

The Scheme is mainly adapted for students who are prepared to devote two evenings a week, during four years, to their studies. The progress of the student is to be tested each year. At the end of the first and of the second years the Department notifies to the schools the results for each candidate, but it does not issue a formal Certificate. The Technical Education Committee, however, will issue an Official Certificate to those who are successful in any year of their Courses. For the benefit of advanced students, the first and second years Examinations will be held on different days, and they will be allowed to take these together if they are capable of answering the questions in both: by which means they may shorten the Course by one year. At the end of the third year the Department will issue to each successful student a Provisional Certificate; and at the end of the fourth year a Full Course Diploma, enumerating the subjects in which the student has qualified during his Course. All such Certificates are necessarily dependent upon the success of the candidate at the Examinations; but in the case of practical work the notebooks kept by the student during the Session may be consulted and taken into account.

It is further proposed to issue a Full Course Honours Certificate to candidates who take the further examinations specified in the various Courses.

Supplementary Examinations are prescribed for candidates who desire to be recognised as Teachers in the prescribed Courses.

An Examination fee of 1s. 6d. will be payable by candidates for each subject of examination prescribed. In the case of certain Technological Subjects, the Examinations of the City and Guilds of London Institute will be made use of: in every such case the fee charged by the City and Guilds is payable by the candidate.

For full information and particulars of the subject-matter included in each Course, students should consult the publication issued by the Department, entitled:

“Syllabuses of Examinations.”

A copy of this will be hung up in the entrance at Bolton Street and at Kevin Street for the convenience of the students.

For the most part these Syllabuses are covered by the Class-work of the Dublin Technical Schools, and when necessary this work will be re-arranged so as to enable students to prepare for the Examinations in the various classes. There are, however, some subjects, such as Hygiene, Laundry Work, and Economics, for which provision is not yet made.

Students are strongly advised to shape their work in accordance with this Scheme, and qualify for the Certificates offered.

CALENDAR AND MEMORANDA.

1912.

Tuesday, September 17th	.. Inaugural Address in the new Institute at Bolton Street.
Wednesday, September 18th	.. Enrolment of Students begins.
Wednesday, September 13th	.. Entrance Examinations begin.
Monday, September 23rd	.. Classes commence.
Monday, September 30th	.. School of Music opens.
Friday, December 20th	.. Last Meeting of the Classes before Christmas.
Wednesday, December 25th	.. Christmas Day.

1913.

Thursday, January 2nd	.. Classes resume after Christmas vacation.
Friday, February 21st	.. Applications for Society of Arts Examinations—Commercial—to be lodged in the Office by this date.
Wednesday, February 26th	.. Applications for Board of Education Examinations—Science and Art—must be lodged in the Office by this date.
Saturday, March 1st	.. Applications for the City and Guilds of London Examinations—Technology—must be lodged in the Office by this date.
Friday, March 14th	.. Art Works for the National Competition and Drawings in Building Construction and Machine Construction are to be lodged in the Office by this date.
Monday, March 17th	.. St. Patrick's Day.
Friday, March 28th	.. Candidates in Painters' and Decorators' Work to forward their practical Work to the City and Guilds of London.
Wednesday, March 19th	.. Last Meeting of Classes before Easter.
Thursday, March 27th	.. Classes resume after Easter Vacation.
Monday, April 7th	.. Society of Arts Examinations begin.
Saturday, April 26th	.. City and Guilds of London Examinations begin.
Saturday, April 19th	.. Specimens of Practical Work or Designs should be forwarded to the City and Guilds of London.
Saturday, April 26th	.. Candidates in Carpentry and Joinery (Honours Grade) should forward specimens of their Practical Work to the City and Guilds of London.
Monday, May 5th	.. Examinations begin.
Saturday, May 10th	.. Session Ends. All Classes end.
Saturday, May 10th	.. School of Music Closed.

Teaching Staff.

MATHEMATICS.

LECTURERS

P. A. E. DOWLING, B.A. ✓
 R. VINCENT WALKER, B.A. ✓
 M. A. HARTNETT, B.A.
 A. J. DONNELLY, B.Sc., M.A.
 Math. Stud., R.U.I.

MECHANICAL ENGINEERING.

LECTURERS AND DEMONSTRATORS

JOHN TAYLOR, M.A.,
 Associate R.C.Sc.I.; Whitworth
 and Royal Exhibitioner.
 C. B. OUTON, ✓
 Whitworth Scholar.
 E. E. JOYNT.
 R. J. DOWLING. ✓
 R. W. TAYLOR. ✓

WORKSHOP INSTRUCTORS

P. PUZZAU. ✓
 M. REILLY. ✓
 H. TAYLOR. ✓
 J. MANNING. ✓
 J. T. DUIGNAN. ✓

ELECTRICAL ENGINEERING.

LECTURERS AND DEMONSTRATORS

THOMAS TOMLINSON,
 B.E.; A.M.I.E.E.
 JOSEPH TIERNEY, A.M.I.E.E. ✓
 JOHN ROTHWELL. ✓

WORKSHOP INSTRUCTOR

PHYSICS.

LECTURERS AND DEMONSTRATORS

WM. J. LYONS, B.A., ✓
 Associate R.C.Sc.L.
 CHARLES I. SANSOM,
 Associate R.C.Sc.L.
 EUGENE MOYNIHAN,
 Associate R.C.Sc.L.
 J. ENRIGHT, B.A.

CHEMISTRY.

LECTURERS AND DEMONSTRATORS

P. BERTRAM FOY, F.C.S. (Principal). ✓
 J. J. HUTCHINSON. ✓
 M. J. O'CONNOR.
 B. G. FAGAN,
 Associate R.C.Sc.I.

BOTANY AND MATERIA MEDICA.**LECTURER**

J. ADAMS, M.A.

BUILDING TRADES.**LECTURERS AND
DEMONSTRATORS**RICHARD COULSON, F.S.I.,
L.R.I.B.A.M. J. BURKE,
Architect.**INSTRUCTORS**JOHN BOLTON,
W. F. NAGLE, R.H.A.,
Medallist. ✓

THOMAS MARKEY. ✓

JOSEPH KING. ✓

JAMES SAUNDERS. ✓

GEORGE PAPPIN. ✓

JAMES HICKS. ✓

T. W. THORNTON. ✓

MISCELLANEOUS TRADES.**INSTRUCTORS**

EDWARD LEONARD. ✓

JOHN BYRNE. ✓

JOSEPH ADDISON.

JOHN LACY.

DOMESTIC ECONOMY SUBJECTS.**LECTURERS**Miss BELLINGHAM TODD, ✓
Diplomé, Leeds, London and
Manchester Schools of Cookery
and Domestic Economy.Miss K. CLANCY,
First Class Diplomé, Cookery,
Laundry, Dressmaking, Irish
Training School of Domestic
Economy.

Miss K. DOYLE.

Miss K. M. MURPHY,
First Class (Special Distinction)
National Union of Teachers; ap-
proved by City and Guilds of
London.

Miss A. CLARKE.

Miss K. O'SULLIVAN.

Miss R. SHARPE.

Miss R. M. J. DOYLE.

PRINTING TRADES.**INSTRUCTORS**

M. HANLY, B.A. ✓
 C. E. LODGE. ✓
 R. A. LATCHFORD.

COMMERCIAL SUBJECTS.**TEACHERS**

MARTIN WHEELER, M.A. (Principal.) ✓
 D. K. LEAHY, B.A. ✓
 MICHAEL MORRISSEY. ✓
 DENIS LYNCH. ✓
 M. P. CRINION, B.A. ✓
 F. C. WALLIS-HEALY, M.J.I.,
 Fellow of Institute of Shorthand ✓
 Writers, Ireland. ✓
 M. F. BOYLE, P.C.T.
 Pitman Silver Medallist; Gold ✓
 Medallist, D.S.W.A. ✓
 Miss C. MORAN.
 A. MANLY. ✓
 JAMES O'SHEA.
 M. F. FLOOD, M.A.
 MICHAEL HAYES, M.A.
 MICHAEL QUANE.

ART AND ARTISTIC CRAFTS.**LECTURERS**

WILLIAM L. WHELAN,
 Art Master; Silver and Bronze
 Medallist, National Competition.
 WILLIAM MILLARD. ✓
 J. J. BOURKE.

INSTRUCTORS

JOHN MILLIGAN.
 THOMAS MATHERS.
 HENRY TAYLOR. ✓

MUSIC.**INSTRUCTORS**

W. H. NESBITT. ✓
 THOMAS MITCHELL. ✓
 MRS. H. ANNESLEY. ✓
 A. B. CULLEN. ✓
 Mrs. BLOOM POLLOCK. ✓
 P. J. GRIFFITH. ✓
 ALEX. BURKE. ✓

FEES.

All Fees are payable in advance, and no Fee is returnable under any circumstances.

All Fees cover the entire Session—from September 23rd, 1912, to May 9th, 1913.

HALF-A-CROWN FEES.

A Fee of 2s. 6d. is charged for either of the Preparatory Courses, namely, for the Introductory Course or the Preliminary Course of any Department.

A Fee of 2s. 6d. is charged for either of the Hairdressing Classes.

FIVE SHILLING FEES.

ial Fee,
5/-

Five Shillings for the entire Session is the Fee charged for any Official Technical Course which does not include Chemistry.

Five Shillings for the entire Session is the Fee charged for any single Class, except where a special Fee is named on this Page.

SEVEN-AND-SIX FEE.

Seven Shillings and Sixpence is the Fee charged for Aeroplane Model Making ; for Pure Mathematics, Stages 3, 4, and 5 ; for Mathematical Physics ; for the Senior Stages of Physics, Electricity, Electrical Engineering, and Mechanical Engineering ; for Accountancy, and the Senior Stages of all Commercial and Language Subjects.

TEN SHILLINGS.

Ten Shillings is the Fee charged for the Afternoon Cookery Classes, and for Musical Classes to all except Members of Bands.

CITY TRADE'S.

FIFTEEN SHILLINGS.

Fifteen Shillings is the Fee charged for all Courses which include Chemistry, except the Pharmacy Course, which is 20s.

TWENTY SHILLINGS.

One Pound is the Fee charged for the Pharmacy Course.

One Pound is the Fee charged for Surveying ; and is also the Fee charged for Trade Classes to outsiders who are not members of the Trade.

THIRTY SHILLING FEE.

Thirty Shillings is the Fee charged for Theoretical and Practical Chemistry when taken by itself and not as part of a Course.

FEES ARE NOT RETURNABLE UNDER ANY CIRCUMSTANCES.

When a Student chooses to take up an extra Class, in addition to a Course, the particular Fee for that Class has to be paid as well as the Course Fee ; but all optional additions to Courses mentioned in the Prospectus are covered by the Course Fee, and are regarded as part of the Course.

It should be clearly understood that the admission of a Student for such small fees as above for the entire Session, involves an understanding on his part to attend with regularity and to observe the rules. Default in these matters will render him liable to forfeit his ticket; in particular, it may be cancelled if he absents himself from three consecutive meetings of any class whatever, without prior notification and urgent reason.

The Class Fee admits a Student to the Lecture and corresponding Laboratory or Workshop, if any, for the hours and days named in the publication called "List of Classes" under the respective index numbers of Lecture and Practical work. To quote an example, the one fee for Organic Chemistry admits the Student to Lecture Class 64 on Thursday evening, and to Laboratory Class 65 on Thursday and Friday evenings.

Similarly, the Course fee admits a Student to two or three classes as set forth in the Technical Course list, and each Class is to be interpreted as covering all that is described in the last paragraph even though each particular night is not actually mentioned in the Course list.

If any Class or Course Student wishes to work an extra night per week in Laboratory or Workshop, he must take out a special Class Ticket for this night, price 5s. a Term, unless it be in the Chemical Laboratory, when the fee will be 15s. per Term.

The Trade Classes are intended for boys engaged in the actual Trades; outsiders are only admitted if there be room, and on payment of a quadruple fee.

PURCHASING OF TICKETS.

When a Student is about to enter a Class he should go to the Office at Bolton-street or at Kevin-street and purchase half-a-crown red Admission Tickets. These Tickets should then be presented, together with his Entrance Form, to the Clerk authorised to issue Class Tickets, who will give him a Class Ticket in exchange for his Admission Tickets. Before parting with Admission Tickets the Student should write his name on them, but this should not be done until he is quite sure of the exact amount of the Fee which he has to pay, because a Ticket once signed is not afterwards transferable.

The foregoing will be the simple course of procedure to be followed by a candidate who wishes to enter a single Class, but in the case of one who is about to enter a Course, he will need to consult the Teacher and go through preliminaries described on pages 14 and 15. It will be necessary usually for the student to provide himself with two or more of the red Admission Tickets, according to the amount of the Fee. The number of Special Fees are, however, very few, and they will be found described on page 10.

Where Fees are paid by Employers, white Admission Tickets, supplied to the Firms, are to be presented at the Office in exchange for green Class Tickets.

SCHEME OF EXAMINATIONS BY THE DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION.

The Department has organised a Scheme of Examinations, to be held about the close of each Session. These Examinations are intended to test the progress made by the Students pursuing definite lines of Instruction in certain branches. For the present the Courses will be confined to:—Mechanical Engineering, Electrical Engineering, Building Trades, Applied Chemistry, Art, Commerce, and Domestic Economy.

Valuable Certificates will be obtainable by those who follow out a complete Course of Study of a progressive nature, passing the Examinations at the end of each Session.

Courses suitable for these Examinations may be found in this Prospectus, though for the present year our Programme does not cover the full requirements of the Department in Domestic Economy. Further particulars of this Scheme will be printed elsewhere.

GENERAL NOTICES.

For particulars of the valuable Prizes and Certificates offered by the Committee to Students who attend the authorised Courses, see Appendix to Calendar.

Changes of address should be promptly notified to the Office (Bolton Street).

If any Student is absent from three consecutive meetings of any Class, unless for valid cause shown before the third meeting, his Ticket for the Class, or for the whole Course of which it is a part, is liable to be cancelled without further warning.

The Trade classes are intended for those engaged in the several trades. Others will not be admitted before October 14th, and then only if there be room, and on payment of a quadruple fee.

A laboratory or workshop class can only be taken in conjunction with an approved lecture or drawing class. No Student will be allowed to remain in a laboratory or workshop class if his attendance at the lecture or drawing class proves unsatisfactory.

A class may be discontinued in the event of an insufficient number of Students joining or attending; and the number of evenings allotted weekly to any class may be reduced if there be a falling-off in the attendance of Students. The right is reserved to close Classes for any other reason whatever.

Students are to make good any damage done by them.

Smoking, whistling, and loitering are not permitted in the passages or entrance. Newspapers are not allowed either in class-rooms or workshops : and Teachers are earnestly requested both to enforce and observe this prohibition.

Strict order must be observed at all times within the precincts of the Schools.

PRIVILEGES OF REGISTERED STUDENTS.

The duty of investigating the qualifications of intending Students by Examination or otherwise, has been put upon the School authorities by the Department of Technical Instruction. When a boy gets into a wrong class he is apt to waste his own time as well as that of his fellows, and any scheme which will insure a proper classification must be of great utility. In the future, Students who get duly registered as described above, and continue to attend all their classes and to keep the rules, will profit in the following ways :—

1. They will be eligible for the many Prizes and Certificates offered by the Schools. Every Student duly entered in a Course may gain a Money Prize, by his own diligence, and without any competition with others.

2. They will get preference in the admission to any Classes which are likely to be crowded.

3. They will have the advantage of pursuing organised and progressive Courses of study, which should be of special value to them.

FREEDOM OF ENTRY.

At the same time the Committee is unwilling to resort to Coercion, even in the interest of the Students themselves, and so it will be left open for any one who desires to take a Class on his own responsibility, to enter without let or hindrance, on payment of the prescribed fee.

But all such admissions will be subject to the following conditions :—

- (1.) The Teacher of every class must exclude it from any Student who turns out to be unfit for the class.

- (2.) The fee will not be recoverable.

- (3.) Students entering thus will not be eligible for the School Prizes and Certificates.

- (4.) Unqualified Students will not be admitted to Courses at the Course fee.

ENTRANCE EXAMINATION.

The Department of Technical Instruction has taken steps to prevent the admission of Students to classes for which they are not fit, and in which they might become a hindrance to others. On this account some preliminary enquiry has to be made in each case, to ascertain the particular course for which each applicant is fitted. This precaution is obviously in the interests of the individual as well as in that of the general body of Students, and on every ground such enquiry should be welcomed.

For the majority of Students, this means an Entrance Examination, on the results of which the applicants are classified or graded. Students may obtain Second Class in the Entrance Examination, admitting to Introductory Course, on Arithmetic and English only, and may qualify for Specialised Courses (getting a First Class) by taking a third paper in either Drawing or Algebra or Geometry, whichever they choose.

In the present year the Entrance Examination will be held at the Bolton Street Schools, on the nights of September 18, 19, 20, 23, 24, 25, 26, 27 and 30. All new Students are earnestly advised to attend at 7.0 p.m., and prove their fitness by answering the simple questions set. Those who can produce evidence of having passed the Junior Intermediate or some equivalent Examination, and prefer to qualify by means of these records, should make application early in the Session.

DIRECTIONS.

To Old Students.

(a.) Students recognised by the Department.

The names of all Students whom the Department of Technical Instruction has accepted as qualified for the Session 1911-12, are entered on a printed list, which is preserved. These are recognised as "Technical Students," who may continue their progressive Courses of study, on getting their Entrance Forms signed by a responsible Teacher, and paying their fees. This they may do on Sept. 18th, or any subsequent day, and no time should be lost.

(b.) Old Students not on the above List.

All Students, other than those whose names are on the list mentioned under (a), should qualify, as if they were new Students. This they can do by getting a First Class in the Examination, or by bringing precise written evidence which will warrant their admission into the group of Technical Students. [See directions to New Students, concerning the nature of the evidence required.] The fact that an individual may claim to have passed the Entrance Examination in 1909 or 1910, will not suffice, if he has not followed it up by regular attendance. The School Authorities do not undertake to preserve the papers of those who neglect to enter the Classes or of those who cease to attend, and as the Department requires the production of the papers, such applicants must sit again to secure the Examination qualification.

Apart from the question of general qualification it rests with the Student to satisfy the Teacher that he is fit for the Special Course on which he proposes to enter.

To New Students.

Any new-comer, who happens to have passed the Junior Grade Examination of the Intermediate Board, or any other Examination of equal or higher order, can be at once registered as a "Technical Student," and can, with the approval of an authorised Teacher, commence a suitable Technical Course of study. He should come to the School at Bolton Street or Kevin Street early in the Session bringing evidence of his having passed the Examination; he should get his Entrance Form certified, and take out his Ticket.

Any one who gets a First Class in our Entrance Examination, will be in exactly the same position as the foregoing Junior Intermediate Student, and can be entered at once.

Any one who gets only a Second Class in our Entrance Examination is to enter for the "Introductory Course," fee 2/6. If he attends this regularly, he becomes in the following Session, without further examination, a Technical Student *recognised by the Department*.

All the foregoing new Students will enjoy the privileges of Qualified Students, and be eligible for the Prizes and Certificates offered by the Committee which are not limited in number.

Those who fail to get a Second Class in our Entrance Examination, but nevertheless manage to get 20 per cent. marks, will be placed in the Third Class, and allowed to enter the Preliminary Course, fee 2/6. They too will be eligible for Prizes.

All responsible Teachers are of course exempt from the Examination, and New Students should clearly understand that definite evidence of any kind which will establish their educational standard, will enable them to be admitted into the foregoing groups without examination. For instance a note from a Head Master to say that an applicant has been working satisfactorily in the Sixth Standard in his School, will secure the admission of that person into the Introductory Course as a Qualified Student with the consequent privileges. But, after all, the easy Examination itself is the simplest and most satisfactory way of settling the question. Those, however, who prefer to come in on the strength of their previous records, should apply at Bolton Street or Kevin Street early in the Session.

Each one should fill in a simple Application Form, giving his name, address, and occupation, and stating the department in which he wishes to study, whether it be—Mechanical Engineering, Electrical Engineering, Building, Mathematics or Science, a Trade (saying which), Art, Domestic Economy, Printing, or Commerce. On the back of the Application Form should be written the grounds on which he claims admission to the class of Qualified Students *without* examination. He should then go to one of the chief Teachers appointed for the purpose, and submit to him his claim. If accepted he can fill in his Entrance Form, get it certified, and purchase his Ticket straightaway.

Music Students should apply at Chatham Row on September 30th.

USEFUL MEMORANDA.

1. Only Qualified Students can enter for Courses and gain the attendant advantages.—See pages 14, 15 and 19.

2. With a few exceptions, Five Shillings is the fee for a Course, and also for a Single Class.—See page 10. Classes in Theory and Practice, offered together, usually count as a single class. But extra nights at practical work involve an extra fee (see page 11) in all cases, except where they are offered in the Prospectus.

3. There are three kinds of Entrance Form, a *pink* one for Course Students, a *green* one for Free Students, and a *white* one for those who are entering for separate classes. In either case the Form is to be filled up in full detail, after the Simple Application Form has been presented to any Teacher.

4. The *Courses* are to be described by the Symbols attached to them. Thus ENG. 2 refers to the Second year of an Engineering Course, and MAT. 1 to the First year of a Mathematical Course. These symbols are not to be used of *Classes*, since they represent *Courses* only. The names of *Classes* are to be written out where referred to.

5. Read page iii. The procedure for enrolment is as follows: The Applicant fills up the small Application Form to commence with. He presents this to the Head Teacher of the Department he wishes to join.

(a) If the Teacher finds him to be eligible for Free Admission to one of the Official Courses, he writes this fact on the back of the Application Form: and sends him to Mr. Foy or Mr. Wheeler to decide upon the case.

(b) If the Teacher finds that he is not entitled to Free Admission, but considers him eligible for a Course, he writes on the back of the Form the symbol of the Course and year, stating also the grounds of qualification (if not already entered by the Student), and adding his signature to accept responsibility for the judgment. He then directs the Student to fill up the *pink* Entrance Form in full detail, and to take it, together with the Application Form, to the Committee Room for certification. After this the Student presents the certified Entrance Form at the Office, pays his fee, and secures his ticket.

(c) On the other hand, if the Teacher decides that he is not eligible for a Course, he directs the Applicant to fill up in full detail one of the *uncoloured* Entrance Forms, which every Teacher can sign for his own Classes. The Student can then proceed to the Office with this Form, and pay his fee or fees.

6. For methods of qualification, see pages 14, 15, 17 and 20.

7. For dates of Examination, dates of Opening at the various Schools, &c., see page iii.

8. For particulars about FREE ADMISSION, see page 17.

FREE ADMISSION.

The experiment of Free Admission was tried during the Session 1911-12 on a limited scale, but it failed to ensure good attendance. The privilege, which cost nothing, was not universally appreciated. In these circumstances the Committee would be justified in abolishing it altogether, but in justice to those few who did seem to appreciate the boon, it will be continued in their case during the coming Session.

No person, then, will be entitled to claim Free Admission during 1912-13, who did not attend all his Course Subjects regularly in 1911-12; and no one will be entitled who did not obtain Free Admission in 1911, excepting only a few Introductory Students who made good attendances.

Free Admission may be claimed and enjoyed by the following persons under the following conditions, each person being required to comply with every one of the undermentioned conditions:—

1. The Claimant must have secured admission in 1911 to one of the "Privileged" Courses; or else he must have been entered as an Introductory Student attending the Introductory Course.

2. The Claimant must have been registered as having attended at least two-thirds of the Meetings of each Class in his Course. (This rule does not apply to any extra Classes which the student may have taken up in addition to his Course).

3. The Claimant must put in his claim and secure his new Course Ticket before September 28th.

4. He must enter for one of the Official Courses offered in the printed Prospectuses, and unless the Claimant was an Introductory Student in 1911-12, the new Course must be in the same Department of study as the Course he took last Session.

5. He must attend regularly at all the constituent Classes of this Course, and observe all Rules. If any free Student is absent from three consecutive Meetings of any class in the Course, his Course Ticket is liable to be forfeited, and will no longer be available after notice of forfeiture has been posted to him. No student whose attendance has been unsatisfactory will be allowed to attend after Christmas on a Free Ticket or without payment.

If any Student who was qualified for Free Admission in 1911 failed to make his application in time, but attended a "Privileged" Course regularly throughout the past Session, his case will receive special consideration, provided that he sends his claim in writing to Dr. Ryan, Old School of Printing, Chatham Row, before September 21st, 1912.

PREPARATORY COURSES.

Those who pass the ENTRANCE EXAMINATION in the FIRST CLASS may join any of the Technical Courses to be found on the succeeding pages. Those who pass in the SECOND CLASS are to enter one of the "Introductory" Courses below on this page. Those who pass in the Third Class are only at liberty to join one of the "Preliminary" Courses here set forth:—

PRELIMINARY COURSES.

KEVIN STREET.—Trades Group. PRLt.

Elementary Mathematics	Tuesday	7.30—8.30
English	Tuesday	8.35—9.35
Drawing	Friday	7.30—8.30
	<i>or,</i>	8.35—9.35

BOLTON STREET.—General Group. PRLg.

Elementary Mathematics	Wednesday	7.30—8.30
English	Wednesday	8.35—9.35
Drawing	Friday	7.30—8.30
	<i>or,</i>	8.35—9.35

BOLTON STREET.—Commercial Group. PRLc.

Elementary Mathematics	Wednesday	7.30—8.30
English	Wednesday	8.35—9.35
Drawing	Friday	7.30—8.30
	<i>or,</i>	8.35—9.35

INTRODUCTORY COURSES.

KEVIN STREET.—Trades Group. INTt.

Elementary Mathematics	Thursday	7.30—8.30
English	Thursday	8.35—9.35
Drawing	Monday	7.30—8.30
	<i>or,</i>	8.35—9.35

BOLTON STREET.—General Group. INTg.

Elementary Mathematics	Tuesday	7.30—8.30
English	Tuesday	8.35—9.35
Drawing	Monday	7.30—8.30
	<i>or,</i>	8.35—9.35

BOLTON STREET.—Commercial Group. INTc.

Elementary Mathematics	Thursday	7.30—8.30
English,	Thursday	8.35—9.35
Drawing,	Monday	7.30—8.30
	<i>or,</i>	8.35—9.35

The FEE for each of the above Courses is *Half-a-Crown* for the whole Session. No additional Class is permitted for this Fee: but a Student may take up an additional single Class, at the Fee quoted for it on page 2. Any one who does not continue to attend all the Subjects of his Course with regularity risks the forfeiture of his Ticket, and if notice be sent to him by post of his Ticket being cancelled, he will not be able to make further use of it.

TECHNICAL COURSES.

It should be borne in mind that there are two distinct qualifications that require to be settled: firstly, fitness to take up a *specialised* Course of study, that is, to rank as a Technical Student; and secondly, fitness for the particular Course of study chosen. The latter question has to be settled by the responsible Teacher who Vouches the Form, after due enquiry.

In the following pages will be found the Official Technical Courses. These are open to all Students who pass the Entrance Examination in the First Class, or are otherwise qualified in one of the ways already explained. Each one is to take up, under advice or approval, the particular Course which most nearly meets his requirements, and is to adhere to this definite programme without any subsequent variation. If he ceases to attend any component subject of this Course, he must forfeit his entire Ticket. The inclusive fee is not applicable to any group whatever of three subjects which a Student may arrange at will for his own study, but is charged for the definite Courses here announced under—

**ENGINEERING, BUILDING, MATHEMATICS,
PHYSICS AND CHEMISTRY,
BUILDING TRADES, GENERAL TRADES,
ART, DOMESTIC ECONOMY,
PRINTING AND COMMERCE.**

A qualified Student who attends with regularity one of these Authorised Courses of study during the successive years, and makes satisfactory progress, will be entitled to a Certificate at the end.

For one Session's instruction in each of these Courses, the fee charged to a duly authorised Student is *Five Shillings*, except where the Course includes Practical Chemistry, in which case it is *Fifteen Shillings*. The inclusive fee will only admit to *one* of the definite Courses here offered, and is not applicable to any other scheme of study which a pupil may devise for himself. For a few exceptions, see Par. 4 on next page.

Where his year's Course does not consist of more than two subjects a Student will be permitted to add any **one** Class in Mathematics or Drawing without extra charge. Other possible variations will be found in Paragraphs 5 and 6 next page. If he desires to add a Class he must name it definitely on his Application Form, and must not discontinue it without permission: otherwise he runs the risk of forfeiting his entire Ticket. All such additions or variations are subject to approval and sanction, and must be made at the time of entering, and duly recorded on the Entrance Form.

Before joining any Course, a Student should consult the Teacher of the leading or dominant subject, which is the one first mentioned in the list of component subjects. The Application Form should be signed by the Teacher of the dominant subject, and should show in conspicuous letters the short symbol for the Course, thus—**ENG. 3** for Mechanical Engineering, third year; and **EEG. 1** for Electrical Engineering, first year; as quoted in the succeeding pages.

If any former Student should find it at all difficult to pick up the thread of his work in the New Courses now offered, he is to consult the Teacher of his chief subject. It should be clearly understood that a Student who has already studied for two years in the School, does not necessarily join the *third* year of any Course. He is to be entered for that particular year of his Course which is determined by his attainments in his leading subject; so that there may be little or no break in the progressive character of his education.

ENGINEERING.

Students are strongly advised to enter for one of the two following Courses, arranged by the Department, for which the Department intends to hold Examinations, and offers a final Certificate.

* **MECHANICAL ENGINEERING.** (Department Course, No. 1.)

FIRST YEAR.	DMA. 1.	Machine Drawing	Monday
		Practical Mathematics	Wednesday
		Practical Geometry	Friday
SECOND YEAR.	DMA. 2.	Machine Construction	Thursday
		Practical Mathematics	Friday
		Mechanics	Wednesday
THIRD YEAR.	DMA. 3.	Machine Design	Thursday
		Applied Mechanics, &c.	Tuesday
FOURTH YEAR.	DMA. 4.	Machine Design	Tuesday
		Heat Engines	Friday

MECHANICAL ENGINEERING. (Department Course, No. 2.)

FIRST YEAR.	DMB. 1.	Machine Drawing	Monday
		Practical Mathematics	Wednesday
		Practical Geometry	Friday
SECOND YEAR.	DMB. 2.	Machine Construction	Thursday
		Practical Mathematics	Friday
		Mechanics	Wednesday
THIRD YEAR.	DMB. 3.	Applied Mechanics	Tuesday
		Heat Engines	Thursday
		Workshop Practice	Monday
FOURTH YEAR.	DMB. 4.	Heat Engines	Friday
		Workshop Practice	Wednesday

MECHANICAL ENGINEERING. No. 3.

FIRST YEAR.	ENG. 1.	Engineering (Jun.)	Thursday
		Engineering Drawing (Prelim.)	Mon. or Wed.
		Engineering Workshop	Wed. or Mon.
SECOND YEAR.	ENG. 2.	Practical Geometry	Friday
		Engineering Drawing (1)	Tuesday
		Mathematics	Thursday
THIRD YEAR.	ENG. 3.	Engineering (Inter.)	Tues. & Thu.
		Engineering Mathematics	Wednesday
FOURTH YEAR.	ENG. 4.	Engineering (Senior)	Wed. and Fri.
		Engineering Drawing (Senior)	Thursday
FIFTH YEAR.	ENG. 5.	Engine and Machine Design	Thursday
		Structural Design	Monday

MEMORANDA ABOUT TECHNICAL COURSES.

1. No variation whatever can be made in the Official Courses advertised in this publication, except as explained herein.

2. No changes can be made in Tickets when once issued, except in urgent cases where the difficulty could not have been earlier foreseen by the Student. In dealing with the new Courses Students will be allowed to rectify mistakes for good reasons during October, but not later.

3. The Course represents each Student's scheme of work, and no one can enter for two Courses. All additional Classes, except those permitted, must be paid for separately. If a Student decides to change his Course he must forfeit the original Course Ticket, and if the change is not sanctioned in October, he must pay for the new Ticket independently.

4. Teachers recently engaged in teaching and second year Monitors may enter for special Courses that suit their needs, apart from the Official Courses. For such a Course, not exceeding three subjects altogether, the fee will be usually 5s. The same privilege and fee will apply to senior Students who are preparing for special Examinations, and to a few others who are exceptionally situated. If Practical Chemistry be included, the fee is 15s.

5. In the case of those Courses which include less than three subjects, Students will be permitted to add to the Official Courses, without extra charge, a single extra Class as follows:—They may add any class in Mathematics or Drawing, if they obtain sanction for it at the time of entering. Drawing includes not only Freehand and Technical Drawing, but Machine Drawing and Practical Geometry. Students in Engineering, Building, or their Allied Trades, may add a class in Physics. Commercial Students may add a Language. Ladies may add any class in Domestic Economy. These additions are subject to sanction: they will, however, be permitted wherever they are reasonable and likely to be of profit. But in no case will a Student be allowed to take more than three subjects for the inclusive Course fee. In interpreting this limitation, Theory and Practice count as but one Subject; similarly Commercial Arithmetic and English.

6. The variations that are possible in the Courses during the present Session are as follows:—The stage of any subsidiary subject may be changed, to fit the Student's particular grade of knowledge, the special evening allotted to Laboratory or other work may be altered, and a Student may be drafted from one class to an equivalent one, such as from Workshop Mathematics to Pure Mathematics. Any form of Mechanical Drawing (including Practical Geometry) may be substituted for any other, at Entrance, while in the Art Department a certain latitude must be allowed to the Art Master, who can, for reasons to be stated on the Entrance Form, interchange such subjects as Freehand, Model, and Geometrical Drawing which are included in the Primary Course or Group of the Board of Education: and also those that are included in the Secondary Course or Group, wherever this appears to be desirable for an individual Student. In the Commercial and Language Courses, any one Language may be substituted for any other. Any variation of this kind must be made at the time of entering; and must be sanctioned and duly recorded on the Entrance Form.

7. Wherever a Course contains an Alternative, indicated by the word "or," the Student may be allowed to take up both the alternatives, if the total number of his Course Classes will not exceed three altogether.

8. Laboratory Classes described as "Additional" are in every case optional.

9. It should be remembered that if a Student neglects or ceases to attend any one Subject of his Course, he risks the loss of his entire ticket. The same risk is incurred by neglecting any additional subject covered by the inclusive fee, but in the case of Subjects separately paid for, the loss is limited to the fee paid for the particular Subject.

ENGINEERING—continued.

MECHANICAL ENGINEERING. (Short Course).

FIRST YEAR.	ZMG. 1.	Engineering (Jun.)	Tuesday
		Engineering Drawing (Prelim.) ..	Wednesday
SECOND YEAR.	ZMG. 2.	Engineering (Inter.)	Tues & Thu.
		Practical Geometry (Stage 1) ..	Friday
THIRD YEAR.	ZMG. 3.	Engineering (Senior A.)	Wednesday
		Engineering (Senior B.)	Friday
FOURTH YEAR.	ZMG. 4.	Engineering Design and Draw. ..	Thursday
		Structural Design,	Monday

[Students will not forfeit their Course tickets by omitting one of the two classes in Engineering (Inter.) in the above Courses, with the permission of the Teacher.]

ELECTRICAL ENGINEERING. (Department Course.) (No. 1.)

FIRST YEAR.	DEE. 1.	Electrical Engineering	Mon. & Thu.
		Practical Mathematics	Wednesday
		Mechanics	Tuesday
SECOND YEAR.	DEE. 2.	Electrical Engineering	Wednesday
		Practical Mathematics	Thursday
		Technical Drawing	Monday
THIRD YEAR.	DEE. 3.	Electrical Engineering	Tuesday
		Applied Mechanics	Wednesday
		Heat Engines	Thursday
FOURTH YEAR.	DEE. 4.	Electrical Engineering	Tuesday

ELECTRICAL ENGINEERING (No. 2).

FIRST YEAR.	EEG. 1.	Electricity and Magnetism	Tuesday
		Physics	Monday
		Technical Mathematics	Thursday
SECOND YEAR.	EEG. 2.	Electrical Engineering (2nd Year)	Mon. & Thu.
		Electrical Engineering, Laby. ..	Mon. & Thu.
		Engineering Mathematics	Wednesday
THIRD YEAR.	EEG. 3.	Electrical Engineering (3rd Year)	Wednesday
		Electrical Engineering, Laby. ..	Wednesday
		Machine Drawing	Thursday
FOURTH YEAR.	EEG. 4.	Electrical Engineering (4th Year)	Tuesday
		Electrical Engineering, Laby. ..	Tuesday
		Technical Mathematics, or	Thursday
		Machine Drawing	Thursday

ELECTRICAL ENGINEERING. (Short Course.) (No. 3.)

FIRST YEAR.	ZEE. 1.	Electricity and Magnetism	Tuesday
		Technical Mathematics	Thursday.
SECOND YEAR.	ZEE. 2.	Electrical Engineering (2nd Year)	Mon. & Thu.
		Electrical Engineering, Laby. ..	Mon. & Thu.
THIRD YEAR.	ZEE. 3.	Electrical Engineering (3rd Year)	Wednesday
		Electrical Engineering, Laby. ..	Wednesday
FOURTH YEAR.	ZEE. 4.	Electrical Engineering (4th Year)	Tuesday
		Electrical Engineering, Laby. ..	Tuesday]

ENGINEERING—continued.

ELECTRICAL WIREMEN AND CABLE JOINTERS.

FIRST YEAR.	WIR. 1.	Electricity and Magnetism ...	Tuesday
		Electrical Wiring Lecture ...	Monday
		Wiremen's Laboratory ...	Mon. & Fri.
SECOND YEAR.	WIR. 2.	Electrical Engineering ...	Mon. & Thu.
		Practical Jointing (1st Year) ...	Tues. or Fri.
THIRD YEAR.	WIR. 3.	Electrical Cable Jointing (Senior) ...	Tues. & Fri.
		Machine Drawing, <i>or</i> ...	Thursday
		Technical Drawing ...	Wednesday

BUILDING.

FOR BUILDERS, CLERKS OF WORKS, &c. (Department Course.)

FIRST YEAR.	DEA. 1.	Building Construction ...	Wednesday
		Practical Mathematics ...	Monday
		Practical Geometry ...	Friday
SECOND YEAR.	DEA. 2.	Building Construction ...	Monday
		Practical Geometry ...	Friday
		Mechanics ...	Wednesday
THIRD YEAR.	DEA. 3.	Building Construction ...	Monday
		Applied Mechanics ...	Tuesday
FOURTH YEAR.	DEA. 4.	Building Construction ...	Tuesday
		Applied Mechanics ...	Wednesday

A Two-Evening Course.

FIRST YEAR.	BL. 1.	Building Construction (Prelim.)...	Wednesday
		Geometrical Drawing (Art) ...	Tuesday
SECOND YEAR.	BL. 2.	Building Construction, Stage 1 ...	Monday
		Practical Geometry, Stage 1 ...	Friday
THIRD YEAR.	BL. 3.	Building Construction, Stage 2 ...	Tuesday
		Builders' Quantities (Junior) ...	Wednesday
FOURTH YEAR.	BL. 4.	Building Construction, Stage 3 ...	Tuesday
		Builders' Quantities (Senior) ...	Wednesday
FIFTH YEAR.	BL. 5.	Building Construction, Honours... ..	Tuesday
		Solid Geometry, or Mathematics... ..	Friday

Students are advised to add one Class in Mathematics, in each year, which is suitable to their ability and progressive in grade. Or, they may add any Class in Drawing or in Applied Mechanics: but they may not take more than three subjects for the Course Fee.

ARCHITECTURE.

FOR ARCHITECTS, &c.

A Two-Evening Course.

FIRST YEAR.	AR. 1.	Builders' Drawing ...	Wednesday
		Geometrical Drawing (Art), <i>or</i> ...	Tuesday
		Freehand Drawing ...	Thursday
SECOND YEAR.	AR. 2.	Building Construction, Stage 1 ...	Monday
		Model, Memory and Plant Drawing ...	Wednesday
THIRD YEAR.	AR. 3.	Building Construction, Stage 2 ...	Tuesday
		Builders' Quantities (Junior) ...	Wednesday
FOURTH YEAR.	AR. 4.	Building Construction, Stage 3 ...	Tuesday
		Builders' Quantities (Senior) ...	Wednesday
FIFTH YEAR.	AR. 5.	Building Construction, Honours... ..	Tuesday
		Light and Shade Drawing, <i>or</i> ...	Monday
		Design	Thursday

Candidates are recommended to take the above Course, and to add to it, if possible, progressive Classes in Mathematics according to their ability.

MATHEMATICS AND SCIENCE.

PURE MATHEMATICS COURSE.

FIRST YEAR.	MAT. 1.	Pure Mathematics, Stage 1 ..	Friday
		Theoretical Mechanics, Stage 1 ..	Monday
SECOND YEAR.	MAT. 2.	Pure Mathematics, Stage 2 ..	Tuesday
		Theoretical Mechanics, Stage 2 ..	Wednesday
THIRD YEAR.	MAT. 3.	Pure Mathematics, Stage 3 ..	Monday
		Pure Mathematics, Stage 3 ..	Friday
FOURTH YEAR.	MAT. 4.	Pure Mathematics, Stage 5 ..	Friday
		Pure Mathematics, Stage 5, <i>or</i> ..	Wednesday
		Pure Mathematics, Stage 4 ..	Wednesday
FIFTH YEAR.	MAT. 5.	Pure Mathematics, Stage 5 ..	Wednesday
		Pure Mathematics, Stage 5 ..	Friday
		Pure Mathematics, Stage 6 ..	Wednesday

In the third year may be added, at option, Mathematics, Stage 4, on Wednesdays.

APPLIED MATHEMATICS COURSE.

FIRST YEAR.	MAp. 1.	Practical Mathematics, Stage 1 ..	Monday
		Engineering Mathematics, Stage 1 ..	Wednesday
SECOND YEAR.	MAp. 2.	Practical Mathematics, Stage 2 ..	Friday
		Engineering Mathematics, Stage 2 ..	Wednesday
THIRD YEAR.	MAp. 3.	Practical Mathematics, Stage 3 ..	Tuesday
		Theoretical Mechanics, Stage 2 ..	Wednesday
FOURTH YEAR.	MAp. 4.	Pure Mathematics, Stage 3 ..	Monday
		Pure Mathematics, Stage 3 ..	Friday
		Mathematical Physics (1) ..	Tuesday
FIFTH YEAR.	MAp. 5.	Pure Mathematics, Stage 5 ..	Wednesday
		Pure Mathematics, Stage 5 ..	Friday
		Mathematical Physics (2) ..	Thursday

EXPERIMENTAL PHYSICS COURSE. No. 1.

FIRST YEAR.	PYS. 1.	Physics (Jun.) Lecture ..	Monday
		Physics (Jun.) Lab. ..	Monday
		Inorg. Chemistry, Lecture ..	Wednesday
		Inorg. Chemistry Lab. ..	Tuesday
SECOND YEAR.	PYS. 2.	Physics (Inter.) Lecture ..	Thursday
		Physics (Inter.) Lab. ..	Thursday
		Electricity and Magn., Lect. ..	Tues. or Fri.
		Electricity and Magn., Lab. ..	Tues. or Fri.
THIRD YEAR.	PYS. 3.	Physics (Sen.) Lecture ..	Thursday
		Physics (Sen.) Lab. ..	Thursday

A Class in Mathematics can, and ought to be, added.

EXPERIMENTAL PHYSICS COURSE. No. 2.

FIRST YEAR.	ZPS. 1.	Physics (Jun.) Lecture ..	Mon. or Tues.
		Physics (Jun.) Lab. ..	Mon. or Tues.
		Mathematics ..	Friday
SECOND YEAR.	ZPS. 2.	Physics (Elec. & Magn.) Lect. ..	Tues. or Fri.
		Physics (Elect. & Magn.) Lab. ..	Tues. or Fri.
		Mathematics ..	Mon. or Tues.
THIRD YEAR.	ZPS. 3.	Physics (Inter.) Lecture ..	Thursday
		Physics (Inter.) Lab. ...	Thursday
		Mathematics ..	Monday and Friday
FOURTH YEAR.	ZPS. 4.	Physics (Senior) ..	Thursday
		Mathematics ..	Monday and Friday

MATHEMATICS AND SCIENCE—continued.

ELECTRICITY AND MAGNETISM.

FIRST YEAR.	MAG. 1.	Electricity and Magnetism (Jun.)	Tues. or Fri.
		Physics (Jun.),	Mon. or Tues.
SECOND YEAR.	MAG. 2.	Electricity and Magnetism (Inter.),	Wednesday
		Physics (Inter.),	Thursday
		or Mathematics	Friday
THIRD YEAR.	MAG. 3.	Electricity and Magnetism (Senior)	Friday
		Mathematics	Monday and Wednesday

Electricity and Magnetism may be substituted for Physics in any case, and *vice versa*.

MATHEMATICAL PHYSICS COURSE.

FIRST YEAR.	MPs. 1.	Mathematical Physics, Stage 1 ..	Monday
		Mathematics, Pure, Stage 1 ..	Friday
SECOND YEAR.	MPs. 2.	Mathematical Physics, Stage 2 ..	Wednesday
		Mathematics, Pure, Stage 2 ..	Tuesday
THIRD YEAR.	MPs. 3.	Mathematical Physics, Stage 3 ..	Tuesday
		Mathematics, Pure, Stage 3 ..	Monday
		Mathematics, Pure, Stage 3 ..	Friday
FOURTH YEAR.	MPs. 4.	Mathematical Physics, Stage 4 ...	Thursday
		Mathematics, Pure, Stage 5 ...	Wed. and Fri.

CHEMISTRY.

INORGANIC CHEMISTRY COURSE. No. 1.

FIRST YEAR.	CHM. 1.	Chemistry (Inorganic), Stage 1, Lec.	Wednesday
		Chemistry (Inorganic), Stage 1, Lab.	Tuesday
		Physics, Lecture and Laby. ..	Monday
SECOND YEAR.	CHM. 2.	Chemistry (Inorganic), Stage 2, Lect.	Monday
		Chemistry (Inorganic) Stage 2, Lab.	Monday
		Additional Laboratory Work ..	Wednesday
THIRD YEAR.	CHM. 3.	Chemistry (Inorganic) Stage 3, Lect.	Monday
		Chemistry (Inorganic) Stage 3, Lab.	Tuesday
		Additional Laboratory Work ..	Monday
FOURTH YEAR.	CHM. 4.	Chemistry (Inorganic), Honours	Wednesday
		Chemistry (Inorganic). Laby. ..	Wednesday
		Additional Laboratory Work ..	Monday

INORGANIC CHEMISTRY COURSE. No. 2.

FIRST YEAR.	ZCS. 1.	Chemistry (Inorg.), Stage 1, Lecture	Wednesday
		Chemistry (Inorg.), Stage 1, Laby.	Tuesday
		Mathematics, Stage 1	Friday
SECOND YEAR.	ZCS. 2.	Chemistry (Inorg.), Stage 2, Lect.	Monday
		Chemistry (Inorg.), Stage 2, Laby.	Monday
		Additional Laboratory (Optional)	Wednesday
THIRD YEAR.	ZCS. 3.	Chemistry (Inorg.), Stage 3, Lect.	Monday
		Chemistry (Inorg.), Stage 3, Laby.	Monday
		Additional Laboratory (Optional)	Tuesday

The inclusive fee for the foregoing Chemical Courses is 15s. for the Session.

ORGANIC CHEMISTRY COURSE.

FIRST YEAR.	CHO. 1.	Chemistry (Inorganic) Stage 1, Lect.	Wednesday
		Chemistry (Inorganic) Stage 1, Lab.	Tuesday
		Physics, Lecture and Laboratory	Monday
SECOND YEAR.	CHO. 2.	Chemistry (Organic), Stage 1, Lect.	Thursday
		Chemistry (Organic), Stage 1, Lab.	Thursday
		Additional Laboratory (optional)	Friday
THIRD YEAR.	CHO. 3.	Chemistry (Organic), Stage 2, Lect.	Friday
		Chemistry, Organic, Laboratory	Friday
		Additional Laboratory (optional)	Thursday

The inclusive fee for the foregoing Chemical Courses is 15s. for the Session.

APPLIED CHEMISTRY. (Department Course.)

FIRST YEAR.	DAC. 1.	Elementary Physics ...	Monday
		Elementary Chemistry ...	Wed. and Tues.
SECOND YEAR.	DAC. 2.	Inorganic Chemistry ...	Monday
		Chemical Analysis ...	Tues. and Wed.
THIRD YEAR.	DAC. 23.	Inorganic Chemistry ...	Monday
		Chemical Analysis ...	Tues., Wed. or Thurs.
		Organic Chemistry ...	Thursday
FOURTH YEAR	DAC. 4.	Organic Chemistry ...	Friday
		Chemical Analysis ...	Wed., Thurs., or Fri.

The inclusive Fee for this Course is 15s.

PHARMACY COURSE.

FIRST YEAR.	PHR. 1.	Chemistry (Inorganic), Stage 1, Lec.	Wednesday
		Chemistry (Inorganic), Stage 1, Lab.	Wednesday
		Additional Laboratory (optional)	Monday
		Botany and Materia Medica ..	Friday
		or, Pharmacy	Thursday
SECOND YEAR.	PHR. 2.	Chemistry (Organic) Stage 1, Lect.	Thursday
		Chemistry (Organic) Stage 1, Lab.	Thursday
		Additional Laboratory (Inorganic)	Monday.
THIRD YEAR.	PHR. 3.	Chemistry (Organic) Stage 2, Lect.	Friday
		Chemistry (Organic) Stage 2, Lab.	Friday
		Additional Laboratory (Organic)	Thursday

[Pharmaceutical Students may attend an additional Laboratory Class for the one fee of 20s. In order to get a Certificate of attendance for this Course. Students must attend at least 20 lectures in Chemistry, besides Laboratory work, and in addition 20 lectures in either Pharmacy, or in both Botany and Materia Medica.]

BUILDING TRADES.

CARPENTERS AND JOINERS.—*Two-Evening Course.*

FIRST YEAR.	CJy. 1.	Carpentry and Joinery, (Junior)	Tuesday
		Technical Drawing	Wednesday
SECOND YEAR.	CJy. 2.	Carpentry and Joinery, (Inter.)	Thursday
		Building Construction, Stage 1	Monday
THIRD YEAR.	CJy. 3.	Carpentry and Joinery, (Senior)	Monday
		Building Construction, Stage 2	Tuesday

Students who attend their Course subjects regularly will be admitted to an additional Practical Class on Friday evenings.

Students are at liberty to add to the above a Class in Mathematics suited to their needs, and they are recommended to do so. Builders' Quantities may be substituted for Building Construction in this Course only.

CARPENTERS AND JOINERS.—*Three-Evening Course.*

FIRST YEAR.	CRP. 1.	Carpentry and Joinery, (Junior)	Tuesday
		Technical Drawing	Wednesday
		Geometrical Drawing (Art) ..	Thursday
SECOND YEAR.	CRP. 2.	Carpentry and Joinery, (Inter.)	Thursday
		Building Construction, Stage 1	Monday
		Model Drawing	Wednesday
THIRD YEAR.	CRP. 3.	Carpentry and Joinery, (Senior)	Monday
		Building Construction, Stage 2	Tuesday
		Builders' Quantities	Wednesday

Students who attend their Course subjects regularly will be admitted to an additional Practical Class on Friday evenings.

[Practical Plane and Solid Geometry may be taken in place of any one of the subsidiary subjects in Carpenters' and Joiners' Courses.]

PLUMBERS.—*Two-Evening Course.*

FIRST YEAR.	PB. 1.	Plumbing (Junior) Lecture ..	Tuesday
		Plumbing (Junior) Practice ..	Tuesday
		Technical Drawing,	Wednesday
SECOND YEAR.	PB. 2.	Plumbing (Inter.) Lecture ..	Thursday
		Plumbing (Inter.) Drawing ..	Thursday
		Plumbing (Inter.) Practice ..	Friday
THIRD YEAR.	PB. 3.	Plumbing (Senior)	Wednesday
		Plumbing, (Sen.) Practical ..	Wednesday

Students are advised to add a Class in Mathematics or Drawing to the above. Those who attend regularly at all their Course Classes will be admitted to an extra Practical Class.

BUILDING TRADES—continued.

PLASTERERS.

FIRST YEAR.	PL. 1.	Plasterers' Work (Junior) ..	Thursday
		Technical Drawing ..	Wednesday
		or Modelling	Monday
SECOND YEAR.	PL. 2.	Plasterers' Work (Inter.) ..	Wednesday
		Geometrical Drawing (Art) ..	Tuesday
THIRD YEAR.	PL. 3.	Plasterers' Work (Senior) ..	Tuesday
		Modelling	Wednesday

Students who attend their Course Classes regularly will be admitted to an extra Practical Class.

PAINTERS AND DECORATORS.

FIRST YEAR.	PN. 1.	Painters' Practical Work, Jun. ..	Thursday
		Theory for Painters ..	Wednesday
		Extra Practical	Friday
SECOND YEAR.	PN. 2.	Painters' Practical Work (Inter.)	Tuesday
		Design and Drawing for Painters	Friday
		Extra Practical	Thursday
THIRD YEAR.	PN. 3.	Painters' Practical Work (Sen.)	Monday
		Painters' Practical Work (Sen.)	Wednesday

METAL PLATE WORKERS.

FIRST YEAR.	MPL. 1.	Technical Drawing, ..	Wednesday
		Geometrical Drawing (Art) ..	Tuesday
		Freehand Drawing	Thursday
SECOND YEAR.	MPL. 2.	Technical Work (Junior) ..	Thursday
		Technical Lecture and Drawing	Tuesday.
THIRD YEAR.	MPL. 3.	Technical Work (Senior) ..	Wednesday
		Technical Lecture and Drawing	Monday

Students may omit one of the Drawing Classes in First Year if sanctioned on Entrance Form. They are strongly advised to add a Class in Workshop Mathematics, in each year, which they may do without extra fee, in spite of the number of classes. If sufficient Students attend their Course Classes regularly during October, an extra Practical Class will be held on subsequent Fridays for those Students.

BUILDING TRADES—continued.

CABINET MAKERS.—*Two-Evening Course.*

FIRST YEAR.	CB. 1.	Cabinet-making (Jun.) ..	Tuesday
		Freehand Drawing ..	Thursday
SECOND YEAR.	CB. 2.	Cabinet-making (Int.) ..	Wednesday
		Geometrical Drawing ..	Tuesday
THIRD YEAR.	CB. 3.	Cabinet-making (Sen.) ..	Monday
		Design applied to Crafts ..	Thursday

Those who attend their Course subjects regularly will be admitted to an extra Practical Class on Thursday evenings, if the number is sufficient.

WOOD-CARVING. *Two-Evening Course.*

FIRST YEAR.	WD. 1.	Wood-carving (Junior) ..	Thursday
		Freehand Drawing ..	Friday
SECOND YEAR.	WD. 2.	Wood-carving (Inter.) ..	Tuesday
		Design ..	Thursday
THIRD YEAR.	WD. 3.	Wood-carving (Senior) ..	Monday
		Modelling in Clay, <i>or</i> ..	Wednesday
		Design ..	Friday

Those who attend their Course subjects regularly, will be admitted to an extra Practical Class on Wednesday evenings, if the numbers justify it.

TAILORS' CUTTING.

FIRST YEAR.	TC. 1.	Tailors' Cutting (Jun.) ..	Thursday
		Freehand Drawing ..	Thursday
SECOND YEAR.	TC. 2.	Tailors' Cutting (Int.) ..	Friday
		Geometrical Drawing ..	Tuesday
THIRD YEAR.	TC. 3.	Tailors' Cutting (Sen.) ..	Tuesday
		Workshop Mathematics (Opt.) ..	Friday

HAIRDRESSING.

FIRST YEAR.	HR. 1.	Hairdressers' Work (Jun.) ..	Monday
		Freehand Drawing ..	Thursday.
SECOND YEAR.	HR. 2.	Hairdressers' Work (Int.) ..	Wednesday
		Geometrical Drawing ..	Tuesday
THIRD YEAR.	HR. 3.	Hairdressers' Work (Sen.) ..	Wednesday

BOOT AND SHOE MAKING.

FIRST YEAR.	BT. 1.	Boot and Shoe Making (Jun.) ..	Tuesday
		Freehand Drawing ..	Thursday
SECOND YEAR.	BT. 2.	Boot and Shoe Making (Int.) ..	Thursday
		Geometrical Drawing ..	Tuesday
THIRD YEAR.	BT. 3.	Boot and Shoe Making (Sen.) ..	Monday
		Workshop Mathematics (Opt.) ..	Friday

ART.

The Art Department is open on every evening in the week, except on a Saturday, and Art Students in Courses above the First Year Grade may work on any evening in the week when there happens to be room. Students will work under the guidance of the Head Master, who may change the night of work, or otherwise vary the following Courses to meet particular needs.

DRAWING. (Department Course, No. 1).

FIRST YEAR.	DAA. 1.	Object and Memory Drawing ...	Wednesday
		Mechanical Drawing and Design...	Tuesday
SECOND YEAR.	DAA. 2.	Object and Memory Drawing ...	Wednesday
		Drawing from Casts ...	Monday
		Design ...	Thursday
THIRD YEAR.	DAA. 3.	Object and Memory Drawing ...	Monday
		Drawing from Casts ...	Tuesday
		Industrial Design ...	Friday
FOURTH YEAR.	DAA. 4.	Object and Memory Drawing ...	Monday
		Drawing from Natural Forms...	Wednesday
		Industrial Design ...	Friday

MODELLING. (Department Course, No. 2).

FIRST YEAR.	DAB. 1.	Object and Memory Drawing ...	Wednesday
		Mechanical Drawing and Design...	Tuesday
SECOND YEAR.	DAB. 2.	Object and Memory Drawing ...	Wednesday
		Drawing from Casts ...	Monday
		Design ...	Thursday
THIRD YEAR.	DAB. 3.	Object and Memory Drawing ...	Monday
		Modelling from Casts.	Friday
		Modelled Industrial Design ...	Wednesday
FOURTH YEAR.	DAB. 4.	Object and Memory Drawing ...	Monday
		Modelling from Natural Forms...	Friday
		Modelled Industrial Design ...	Wednesday

PAINTING (Department Course, No. 3.)

FIRST YEAR.	DAC. 1.	Object and Memory Drawing ...	Wednesday
		Mechanical Drawing and Design...	Tuesday
SECOND YEAR.	DAC. 2.	Object and Memory Drawing ...	Wednesday
		Drawing from Natural Forms ...	Monday
		Design ...	Thursday
THIRD YEAR.	DAC. 3.	Object and Memory Drawing ...	Monday
		Drawing from Natural Forms ...	Wednesday
		Pictorial Design ...	Friday
FOURTH YEAR.	DAC. 4.	Object and Memory Drawing ...	Monday
		Painting from Natural Forms ...	Wednesday
		Pictorial Design ...	Friday

ART—continued.

ART COURSE NO. 4.

FIRST YEAR	AT. 1.	Freehand Drawing ..	Thursday
		Geometrical Drawing, <i>or</i> ..	Tuesday
		Model Drawing	Wednesday
SECOND YEAR.	AT. 2.	Light and Shade Drawing (Ely.)	Monday
		Modelling in Clay (Jun.), <i>or</i> ..	Wednesday
		Design (Ely.)	Thursday
THIRD YEAR.	AT. 3.	Plant and Memory Drawing ..	Wednesday
		Modelling in Clay (Int.), <i>or</i> ..	Monday
		Design (Adv.)	Friday
FOURTH YEAR.	AT. 4.	Brushwork and Painting ..	Monday
		Modelling in Clay (Sen.), <i>or</i> ..	Wednesday
		Light and Shade Drawing (Adv.)	Wednesday
FIFTH YEAR.	AT. 5.	Specialisation in any one branch of the Art Department.	

ARTS CRAFTS COURSE.

FIRST YEAR.	CFT. 1.	Modelling in Clay (Jun.) ..	Wednesday
		Freehand Drawing	Thursday
		Geometrical Drawing	Tuesday
SECOND YEAR.	CFT. 2.	Modelling in Clay (Int.) ..	Monday
		Model Drawing	Wednesday
		Design	Thursday <i>or</i> Friday
THIRD YEAR.	CFT. 3.	Modelling in Clay (Sen.) ..	Wednesday
		Design applied to Crafts ..	Thursday
		Technical work in one of the following :—	
		Wood-carving	Monday
		Enamelling on Metal ..	Friday
		Stone and Marble Carving ..	Friday
		Ornamental Iron Work ..	Tuesday
FOURTH YEAR.	CFT. 4.	Specialisation in one of the foregoing Crafts.	

ART IRONWORK.

FIRST YEAR.	ZRN. 1.	Ornamental Ironwork (Jun.) ..	Tuesday
		Design (Elementary)	Thursday
SECOND YEAR.	ZRN. 2.	Ornamental Ironwork (Inter.) ..	Tuesday
		Design applied to Crafts ..	Thursday
THIRD YEAR.	ZRN. 3.	Ornamental Ironwork (Sen.) ..	Thursday
		Design	Friday

PRINTING COURSES.

In this and the following Printing Courses, all Students will be at liberty to take Drawing instead of English, or in place of Technical Calculations, but such change is to be made and sanctioned at the time of entering.

COMPOSITORS.

FIRST YEAR.	TYP. 1.	Typography, Lect. and Practice	Monday
		English	Thursday
		Technical Calculations, <i>or</i> ..	Thursday
		Drawing	Friday.
SECOND YEAR.	TYP. 2.	Typography—Lect. and Practice	Thursday
		English	Tuesday
		Technical Calculations, <i>or</i> ..	Tuesday
		Drawing	Wednesday
THIRD YEAR.	TYP. 3.	Typography	Wednesday
		Typography (Optional) ..	Thursday

MACHINE WORK.

FIRST YEAR.	MCH. 1.	Machine Work	Tuesday
		English	Thursday
		Technical Calculations, <i>or</i> ..	Thursday
		Drawing	Friday
SECOND YEAR.	MCH. 2.	Machine Work	Thursday
		English	Tuesday
		Technical Calculations, <i>or</i> ..	Tuesday
		Drawing	Wednesday
THIRD YEAR.	MCH. 3.	Machine Work	Wednesday
		Machine Work (Optional) ..	Thursday
		Technical Drawing (Optional) ..	Friday

LINOTYPE OPERATORS.

FIRST YEAR.	LIN. 1.	Practical Demonstration ..	Tuesday
		Practical Work	Monday
		English, <i>or</i>	Thursday
		Technical Calculations ..	Thursday
SECOND YEAR.	LIN. 2.	Practical Demonstration ..	Thursday
		Practical Work	Wednesday
THIRD YEAR.	LIN. 3.	Practical Demonstration ..	Thursday
		Practical Work	Wednesday

DOMESTIC ECONOMY.

The Department Course in Domestic Economy is set forth below. Since the whole of the subjects are not taught in the Dublin Technical Schools, Students will be allowed to take, for the Course Fee of 5s., any two subjects in Domestic Economy which they may select with a view to qualifying for the Department Course. This privilege applies to qualified Students *only*.

Department Course.

FIRST YEAR.	Cookery. Housewifery.
SECOND YEAR.	Cookery. Laundrywork. Needlework.
THIRD YEAR.	Cookery. Laundrywork. Hygiene. Dressmaking.
FOURTH YEAR.	Cookery (and First Aid and Sick Nursing). Dressmaking.

The set Courses in Domestic Economy hitherto offered, are withdrawn in favour of the Department's Course : but for the present Session Students will be permitted to take any two subjects in this Section for the inclusive fee of 5s., and if Lectures are given in Hygiene or Housewifery this year, those who have tickets for Cookery will be entitled to attend them. Women Students who are taking a set Course of two subjects in any other department may add one subject in Domestic Economy, provided that their total number of subjects does not exceed three.

COMMERCIAL COURSES.

Former Students who have worked at Rutland Square for a year or more, may find it difficult to pick up the thread of their work in the New Courses. They should in all cases, therefore, consult the Teacher of their chief subject or the Teacher of Business Methods. The first subject mentioned in each Course is the dominant subject of that Course, which is continuous and progressive from year to year. Every Student should be entered for the particular year of a Course that is determined by his attainments in the leading subject : so that there may be no break in the progressive character of his education. On all points he should consult the Teacher of this subject, who should moreover sign his Application Form before the Entrance Form is presented. It should be clearly understood that a Student who has been in the school for two years will not necessarily be entered in the *third* year of any one of the new Courses. The year of gradation is to be fixed by his attainments in the leading subject.

COMMERCIAL COURSES—continued.

Unless there be reason to the contrary, permission will be given to make additions as follows to any course consisting of two subjects, but in no case will the fee of 5s. admit to more than three subjects altogether:—Any Student in the Commercial Department may add one Language to his Course without extra payment. All Students of the Schools in any Department are at liberty to add a Mathematical Class or a Drawing Class to their respective Courses. Women Students may also add a Class in Domestic Economy. These privileges must be claimed at the time of purchasing the Ticket, and be duly entered and sanctioned on the Entrance Form. Every Student must continue to attend his proper Course subjects with regularity, but he may be released from attendance at an additional voluntary subject by the Teacher. Should he cease to attend even an additional subject without the sanction of his Teacher, he risks the forfeiture of his Course ticket.

In Subjects which are taught on more than one evening in the week in the same grade, Course Students may choose whichever evening they prefer.

Qualified Students may enter for any one of the following Courses on payment of an inclusive fee of 5s. for the year, after obtaining the requisite sanction. If any one finds it hard to select the Course which most nearly meets his requirements, or has any other preliminary difficulty, he should consult the Principal of the Department, Mr. Wheeler.

GENERAL COURSES.

Students are strongly recommended to take up one of the two following General Courses in Commerce, for which the Department will hold Examinations, and for which the Department offers a final Certificate.

Department Course, No. 1.

FIRST YEAR.	DCA. 1.	Commercial Correspondence	...	Monday
		Commercial Arithmetic	...	Monday
		Book-keeping, <i>or</i>	...	Tuesday
		Shorthand	...	Wednesday
SECOND YEAR.	DCA. 2.	Commercial Arithmetic	...	Friday
		Book-keeping...	...	Thursday
		Business Methods	...	Tuesday
THIRD YEAR.	DCA. 3.	Book-keeping...	...	Tuesday
		Business Methods and Economics	...	Thursday
FOURTH YEAR	DCA. 4.	Accountancy ...	...	Thursday
		Commercial Geog. and Economics	...	Friday

COMMERCIAL COURSES—continued.

Department Course, No. 2.

FIRST YEAR.	DCB. 1.	Commercial Correspondence	...	Monday
		Commercial Arithmetic	...	Monday
		Book-keeping, <i>or</i>	...	Tuesday
		Shorthand	...	Wednesday
SECOND YEAR.	DCB. 2.	Business Methods	...	Wednesday
		A Modern Language	...	
THIRD YEAR.	DCB. 3.	Shorthand, <i>and</i>	...	Wednesday
		Economics	...	Thursday
		The same Language.		
FOURTH YEAR.	DCB. 4.	Commercial Geography, <i>and</i>	...	Friday
		Economics	...	Friday
		The same Language.		

SPECIAL COURSES.

FOR BUSINESS PURPOSES. No. 1.

FIRST YEAR,	BS. 1.	Business Methods (Jun.)	..	Wednesday
		Book-keeping (Jun. A.)	..	Monday
SECOND YEAR.	BS. 2.	Business Methods (Inter.)	..	Tuesday
		Book-keeping (Inter.)	..	Thursday
		Commercial Geography	..	Friday
THIRD YEAR.	BS. 3.	Business Methods (Sen.)	..	Thursday
		Book-keeping (Sen.)	..	Tuesday
FOURTH YEAR.	BS. 4.	Accountancy	..	Thursday

FOR BUSINESS PURPOSES. No. 2.

FIRST YEAR.	BSN. 1.	Business Methods (Jun.)	..	Wednesday
		(Men and Boys.) Book-keeping (Jun. A.)	..	Monday
		Commercial Correspondence, &c.	..	Thursday
SECOND YEAR.	BSN. 2.	Business Methods (Inter.)	..	Tuesday
		Book-keeping (Inter.)	..	Thursday
		Commercial Correspond., &c. (Sen.)	..	Friday
THIRD YEAR.	BSN. 3.	Business Methods (Sen.)	..	Thursday
		Book-keeping (Sen.)	..	Tuesday
		Commercial Geography	..	Friday

COMMERCIAL COURSES—continued.

BOOK-KEEPERS.

FIRST YEAR.	ZBK. 1.	Book-keeping (Jun. B.) ..	Tuesday
	(Men and Boys.)	Shorthand (Jun. B.) ..	Thursday
	(Women and Girls.)	Book-keeping (Jun. B.) ..	Tuesday
		Shorthand (Jun. C.) ..	Monday
SECOND YEAR.	ZBK. 2.	Book-keeping (Inter.) ..	Thursday
		Shorthand (Inter.) ..	Friday
THIRD YEAR.	ZBK. 3.	Book-keeping (Sen.) ..	Tuesday
		Shorthand (Speed) ..	Monday

Students are advised to add one Language to this Course.

GENERAL COMMERCIAL COURSE.

FIRST YEAR.	GCM. 1.	Commercial Correspondence, &c.	Tuesday
	(Men and Boys.)	Shorthand (Jun. B.) ..	Thursday
		Book-keeping (Jun. A.) ..	Monday
	(Women and Girls.)	Commercial Correspondence, &c.	Thursday
		Shorthand (Jun. C.) ..	Monday
		Book-keeping (Jun. C.) ..	Wednesday
SECOND YEAR.	GCM. 2.	Commercial Correspond., &c. (Sen.)	Friday
		Shorthand	Wednesday
		Book-keeping (Inter.) ..	Monday
THIRD YEAR.	GCM. 3.	Commercial Geography ..	Friday
		Shorthand	Monday
		Book-keeping (Sen.) ..	Tuesday
FOURTH YEAR.	GCM. 4.	Accountancy ..	Thursday

FOR CORRESPONDENCE CLERKS.

FIRST YEAR.	COR. 1.	Commercial Correspondence, &c.	Monday
		Business Methods (Jun.) ..	Wednesday
		French (Jun.) ..	Friday
SECOND YEAR.	COR. 2.	Commercial Correspond., &c. (Sen.)	Friday
		Business Methods (Inter.) ..	Tuesday
		French (Inter.) ..	Thursday
THIRD YEAR.	COR. 3.	Business Methods (Sen.) ..	Thursday
		German (Jun.), <i>or</i> ..	Friday
		French (Sen.) ..	Monday

COMMERCIAL COURSES—continued.

FOR FOREIGN CORRESPONDENCE CLERKS.

FIRST YEAR.	FRG. 1.	French (Jun. A.)	Monday
		(Men and Boys.) Shorthand (Jun. A.)	Wednesday
		Commercial Correspondence, &c.	Tuesday
(Women and Girls.)		French (Jun. B.)	Tuesday
		Shorthand (Jun. C.)	Monday
		Commercial Correspondence, &c.	Thursday
SECOND YEAR.	FRG. 2.	French (Inter.)	Thursday
		Shorthand (Inter.)	Wednesday
		Commercial Correspondence	Friday
THIRD YEAR.	FRG. 3.	French (Sen.)	Monday
		Shorthand (Sen.)	Tuesday
		Shorthand, Speed	Wednesday

Irish or German may be substituted for French.

LANGUAGES.

LANGUAGE COURSE. No. 1.

FIRST YEAR,	LG. 1.	Irish (Jun.) or German (Jun.) ..	Friday
		French (Jun.)	Tuesday
SECOND YEAR.	LG. 2.	Irish (Sen.) or German (Sen.) ..	Wednesday
		French (Inter.)	Thursday
THIRD YEAR.	LG. 3.	French (Sen.)	Monday
		Commercial Geography	Friday

LANGUAGE COURSE. No. 2.

FIRST YEAR.	ZLG. 1.	Irish (Jun.)	Friday
		French (Jun.)	Tuesday
SECOND YEAR.	ZLG. 2.	French (Inter.)	Thursday
		German (Jun.)	Friday
THIRD YEAR.	ZLG. 3.	French (Sen.)	Monday
		Irish (Sen.) or German (Sen.) ..	Wednesday

TIME TABLE—KEVIN STREET.

No. of Class.		No of Room.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY
PRELIMINARY COURSE—							
Trades Group A.							
1	Elementary Mathematics,	16	..	7.30—8.30	..	..	..
2	English,	16	..	8.35—9.35	..	..	..
3	Drawing,	14	..	..	..	..	7.30—8.30
4	.. .. <i>or,</i>	14	..	..	..	..	8.35—9.35
INTRODUCTORY COURSE—							
Trades Group D.							
13	Elementary Mathematics,	16	..	..	..	7.30—8.30	..
14	English,	16	..	..	..	8.35—9.35	..
15	Drawing,	14	7.30—8.30	..	..	..	..
16	.. .. <i>or,</i>	14	8.35—9.35	..	..	..	..
MATHEMATICS—							
Workshop Mathematics,							
25	Stage 1.	24	..	..	..	..	7.30—8.30
26	Stage 2.	24	..	..	..	..	8.35—9.35
34	Pure Mathematics, Stage 1	28	..	..	..	..	7.30—9.35
35	Pure Mathematics, Stage 2	16	..	7.30—9.35	..	..	..
36	Pure Mathematics, Stage 3	16	7.30—9.35	..	..	..	7.30—8.30
37	Pure Mathematics, Stage 4	24	..	..	7.30—9.35	..	..
38	Pure Mathematics Stage 5	16	..	..	7.30—9.35	..	8.35—9.35
39	Theoretical Mechanics, Stage 1	28	7.30—9.35	..	..	..	..
40	Theoretical Mechanics, Stage 2	28	..	..	7.30—9.35	..	..
41	Mathematical Physics, Ely.	16	..	7.30—9.35	..	..	..
42	Mathematical Physice, Adv.	16	..	..	..	7.30—9.35	..

	PHYSICS—						
43	Physics (Jun. A.)— Lecture	12	7.30—8.30	..	..	..	..
44	Laboratory	10.8	8.35—10.5	..	..	..	..
45	Physics (Jun. B.)— Lecture	12	..	7.30—8.30	..	..	..
46	Laboratory	10.8	..	8.35—10.5	..	..	..
47	Physics (Inter.)— Lecture ..	12	..	..	..	7.30—8.30	..
48	Laboratory	10.8	..	..	..	8.35—10.5	..
49	Physics (Sen.)— Lecture ..	12	..	..	..	7.30—8.30	..
50	Laboratory	10.8	..	..	..	8.35—10.5	..
	Electricity and Magnetism—						
55	(Inter.)— Lecture ..	12	..	..	7.30—8.30	..	..
56	Laboratory	10.8	..	..	8.35—10.5	..	..
57	(Senior)—Lecture ..	12	..	..	..	..	7.30—8.30
58	Laboratory	10.8	..	..	..	..	8.35—10.5

TIME TABLE—*continued.*

No. of Class.		No. of Room.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
	CHEMISTRY—						
	Inorganic Chemistry,						
60	Elementary—	Lecture .. 25	..	..	7.30—8.30	..	..
61	Elementary—	Laboratory 22	..	7.30—10.5	..	..	..
	Inorganic Chemistry,						
62	Advanced—	Lecture .. 25	7.30—8.30	..	..	..	..
63	Advanced—	Laboratory 21	8.35—10.5	7.30—10.5	7.30—10.5	..	..
	Organic Chemistry,						
64	Elementary—	Lecture .. 25	..	..	..	7.30—8.30	..
65	Elementary—	Laboratory 21	..	..	..	8.35—10.5	7.30—10.5
	Organic Chemistry,						
66	Advanced—	Lecture .. 25	..	..	..	..	7.30—8.30
67	Advanced—	Laboratory 21	..	..	..	7.30—10.5	8.35—10.5
	Chemistry for Medical Students						
		Lecture .. 25	..	..	7.30—8.30	..	..
68		Laboratory 22	..	..	..	8.35—10.5	8.35—10.5
	Chemistry for Pharmaceutical Students—Lecture .. 25						
69		Laboratory 22	7.30—10.5	..	7.30—8.30	..	..
70	BOTANY ..	.. 23	..	..	..	..	7.30—8.30
72	MATERIA MEDICA ..	.. 23	..	..	..	..	8.35—9.35
73	PHARMACY ..	.. 23	..	..	..	7.30—9.35	..

ENGINEERING TRADES.							
90	Smiths' Work	6	7.30—9.35	..	..	..	7.30—9.35
91	Brass Finishers	6	..	..	7.35—9.35	..	..
147	Manual Training, Metal ..	6	..	..	..	..	7.30—9.35
BUILDING TRADES.							
120	Plasterers' Work, Junior ..	1	..	..	..	7.30—9.35	..
121	Plasterers' Work, Senior ..	1	..	..	7.30—9.35	..	..
122	Painters and Decorators' Work, Junior	30	..	..	..	7.30—9.35	..
	Extra Practical	30	..	..	..	..	7.30—9.35
123	Painters and Decorators' Work, Intermediate ..	30	..	7.30—9.35	..	..	..
124	Painters and Decorators' Work, Senior	30	7.30—9.35	..	7.30—9.35	..	..
126	Drawing for Painters, Intermediate and Senior ..	30	..	..	..	..	7.30—9.35
127	Theory for Painters, Junior Metal Plate Work—	30	..	..	7.30—9.35	..	..
128	Junior Lecture	5	..	7.30—8.30	..	..	..
129	Junior Drawing	5	..	8.35—9.35	..	..	..
130	Senior Lecture	5	7.30—8.30	..	..	..	..
131	Senior Drawing	5	8.35—9.35	..	..	..	..
	Metal Plate Work, Practical		..	..	..	..	..
132	Junior Class ..	5	..	..	..	7.30—9.35	..
133	Senior Class ..	5	..	..	7.30—9.35	..	..

TIME TABLE—*continued.*

No. of Class		No. of Room.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
BUILDING TRADES— <i>continued.</i>							
134	Cabinetmakers' Work, Junior	9	..	7.30—9.35	..	..	..
135	Cabinetmakers' Work, Inter.	9	..	..	7.30—9.35	..	..
136	Cabinetmakers' Work, Senior	9	7.30—9.35	..	..	..	..
	Extra Practical	9	..	..	..	7.30—9.35	..
MISCELLANEOUS TRADES, Etc.—							
137	Tailors' Cutting, Junior ..	15	..	..	..	7.30—9.35	..
138	Tailors' Cutting, Intermediate	15	..	..	..	..	7.30—9.35
139	Tailors' Cutting, Senior ..	15	..	7.30—9.35	..	..	..
140	Hairdressers' Work, Junior.	15	8.35—10.5	..	..	..	..
141	Hairdressers' Work, Senior	15	..	..	8.35—10.5	..	..
142	Boot and Shoe Making, Junior	3	..	7.30—9.35	..	..	..
143	Boot and Shoe Making, Inter- mediate	3	..	..	..	7.30—9.35	..
144	Boot and Shoe Making, Senior	3	7.30—9.35	..	..	..	..

	MISCELLANEOUS TRADES, Etc.— <i>continued.</i>						
145	Manual Instruction, (Wood) Junior	4	..	..	7.30—9.35	..	..
146	Senior	4	7.30—9.35	..	..	..	..
147	Manual Instruction (Metal)..	6	..	..	..	..	7.30—9.35
	ART AND ARTISTIC CRAFTS—						
150	Freehand Drawing ..	14	..	..	..	7.30—9.35	7.30—9.35
151	Model Drawing ..	14	..	..	7.30—9.35	..	..
152	Geometrical Drawing ..	14	..	7.30—9.35	..	..	..
153	Light and Shade Drawing (Jun.)	14	7.30—9.35	..	..	..	..
154	" " " " (Sen.)	14	..	..	7.30—9.35	..	..
155	Plant and Memory Drawing	14	..	..	7.30—9.35	..	..
156	Brushwork and Painting of Ornament ..	14	7.30—9.35	..	..	..	..
157	Design (Ely. and Adv.) ..	14	..	..	..	7.30—9.35	7.30—9.35
159	Design applied to Crafts ..	14	..	..	..	7.30—9.35	..
160	Modelling in Clay (Jun.) ..	2	7.30—9.35	..	..	..	..
161	Modelling in Clay (Sen.) ..	..	..	..	7.30—9.35	..	7.30..
162	Stone and Marble Carving ..	2	..	..	..	..	—9.35
163	Woodcarving (Sen.) (Int.) (Jun.)	18	7.30—9.35	7.30—9.35	..	7.30—9.35	..
166	Extra Practical ..	..	..	..	7.30—9.35	..	..
167	Enamelling on Metal ..	17	..	..	..	..	7.30—9.35
168	Decorative and Ornamental Iron Work ..	6	..	7.30—9.35	..	7.30—9.35	..

KEVIN STREET.

No. of Class.		No. of Room.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
	DOMESTIC ECONOMY.						
	<i>Afternoon Classes.</i>						
230	Cookery	20	..	3.0—5.5	..	..	..
	<i>Evening Classes.</i>						
231	Cookery—Lecture ..	25	..	7.30—9.35	..	..	..
232	Cookery—Practical, Junior A.	20	7.30—9.35	..	..	..	..
233	Cookery—Practical, Junior B.	20	..	..	7.30—9.35	..	..
234	Cookery—Practical, Senior	20	..	..	..	7.30—9.35	..

CHATHAM ROW.

	DOMESTIC ECONOMY.						
	<i>Afternoon Classes.</i>						
244	Dressmaking—Junior ..	4	3.0—5.5	..	..	..	..
245	Dressmaking—Senior ..	4	..	..	..	..	3.0—5.5
	<i>Evening Classes.</i>						
246	Dressmaking—Junior ..	4	7.30—9.35	..	..	..	..
247	Dressmaking—Senior ..	4	..	..	..	..	7.30—9.35
253	Needlework—Junior ..	4	..	7.30—9.35	..	..	..
254	Needlework—Senior ..	4	..	..	..	7.30—9.35	..

TIME TABLE—RUTLAND SQUARE.

DOMESTIC ECONOMY.							
<i>Afternoon Classes.</i>							
236	Cookery—Junior	3	3.0—5.5	..	..	..	..
237	Cookery—Senior	3	..	..	3.0—5.5	..	..
252	Needlework	5	3.0—5.5	..	..	..	..
248	Dressmaking	5	..	..	..	3.0—5.5	..
<i>Evening Classes.</i>							
238	Cookery—Junior, Lecture ..	3	7.30—9.35	..	..	..	..
240	Cookery—Junior, Practical	3	..	7.30—9.35	..	..	..
239	Cookery—Senior, Lecture ..	3	..	..	7.30—9.35	..	..
241	Cookery—Senior, Practical	3	..	..	..	7.30—9.35	..
255	Needlework—Junior	5	..	..	..	..	7.30—9.35
256	Needlework—Senior	5	7.30—9.35	..	..	..	..
249	Dressmaking—Junior	5	..	..	7.30—9.35	..	..
250	Dressmaking—Senior	5	..	..	..	7.30—9.35	..
259	Millinery—Junior	4	..	..	..	7.30—9.35	..
260	Millinery—Senior	4	..	7.30—9.35	..	..	..

TIME TABLE—BOLTON STREET.

No. of Class.	7	No. of Room.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
PRELIMINARY COURSE—							
General Group B.							
5	Elementary Mathematics,	C. 5	..	..	7.30—8.30	..	..
6	English,	C. 5	..	..	8.35—9.35	..	..
7	Drawing,	<i>or</i> , A. 3	..	..	..	..	7.30—8.30
8	Drawing	A. 3	..	..	..	..	8.35—9.35
Commercial, Group C.							
9	Elementary Mathematics,	A. 3	..	..	7.30—8.30	..	..
10	English,	A. 3	..	..	8.35—9.35	..	..
11	Drawing,	<i>or</i> , A. 3	..	..	..	..	7.30—8.30
12	Drawing	A. 3	..	..	..	..	8.35—9.35
INTRODUCTORY COURSE—							
General, Group E.							
17	Elementary Mathematics,	A. 3	..	7.30—8.30	..	..	..
18	English,	A. 3	..	8.35—9.35	..	..	..
19	Drawing,	<i>or</i> , A. 3	7.30—8.30	..	..	..	..
20	Drawing,	A. 3	8.35—9.35	..	..	..	..
Commercial, Group F.							
21	Elementary Mathematics,	A. 3	..	..	..	7.30—8.30	..
22	English	A. 3	..	..	..	8.35—9.35	..
23	Drawing,	<i>or</i> , A. 3	7.30—8.30	..	..	..	..
24	Drawing	A. 3	8.35—9.35	..	..	..	..

27	Technical Mathematics, Stage 1	B. 3	..	..	..	7.30—8.30	..
28	Technical Mathematics, Stage 2	B. 3	..	..	..	8.35—9.35	..
29	Engineering Maths. Stage 1	B. 3	..	..	7.30—8.30	..	..
30	Engineering Maths. Stage 2	B. 3	..	..	8.45—9.35	..	..
31	Practical Mathematics, Stage 1	B. 3	7.30—9.35	..	..	..	..
32	Practical Mathematics, Stage 2	B. 3	..	..	..	..	7.30—9.35
33	Practical Mathematics, Stage 3	B. 3	..	7.30—9.35	..	..	..
MECHANICAL ENGINEERING—							
74	Engineering, Junior	.. A 5	..	7.30—9.35	..	..	..
75	Technical Drawing, Class A.	A 5	7.30—9.35	..	..	..	..
76	Technical Drawing, Class B.	A 5	..	..	7.30—9.35	..	..
77	Practical Geometry	.. A 5	..	..	..	..	7.30—9.35
79	Machine Drawing	.. A 5	..	..	..	7.30—9.35	..
81	Engine and Machine Design	A 4	..	7.30—9.35	..	..	..
82	Applied Mechanics, Elem.	B 4	..	7.30—10.5	..	..	..
83	Heat Engines, Elem.	B 4	..	..	..	7.30—10.5	..
84	Applied Mechanics, Senior A.	Advanced A 8	..	..	7.30—10.5	..	..
85	Heat Engines, Senior B.	Advanced A 8	..	..	..	..	7.30—10.5
86	Structural Design	.. A 8	7.30—9.35	..	..	..	..
87	Surveying	.. C 10	..	7.30—9.35	..	..	..
88	Aeroplane Modelling	.. C 10	7.30—9.35	..	7.30—9.35	..	7.30—9.35
89	Mechanical Engineering (Workshop)	.. .. D 7	7.30—9.35	7.30—9.35	7.30—9.35	7.30—9.35	..
ELECTRICAL ENGINEERING—							
Electricity and Magnetism							
51	(Junior A)—Lecture	B 8	..	7.30—8.30	..	..	..
52	Laboratory	B 7	..	8.35—10.5	..	..	..
53	(Junior B.)—Lecture	B 8	..	7.30—8.30	..	..	..
54	Laboratory	B 7	..	8.35—10.5	..	..	..

TIME TABLE—*continued.*

No. of Class.		No. of Room.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
	ELECTRICAL ENGINEERING—<i>continued.</i>						
95	Electrical Engineering, Junior						
	Lecture ..	B 8	7.30—8.30	..	..	7.30—8.30	..
96	Laboratory ..	D 5	8.35—10.5	..	..	8.35—10.5	..
	Electrical Engineering, Inter.						
97	Lecture ..	B 8	..	..	7.30—8.30	..	..
	Laboratory ..	D 5	..	..	8.35—10.5	..	..
	Electrical Engineering, Senior						
99	Lecture ..	C 9	..	7.30—8.30	..	..	..
100	Laboratory ..	D 5	..	8.35—10.5	..	..	..
92	Electrical Wiring—Lecture	C 9	7.30—8.30	..	..	..	..
93	Electrical Wiring and Fitting,	D 2	8.35—10.5	..	..	..	7.30—9.35
94	Electrical Cable Jointing ..	D 2	..	7.30—9.35	..	..	7.30—9.35
	BUILDING AND BUILDING TRADES—						
103	Technical Drawing for Building Trades	B 12	..	..	7.30—9.35	..	..
104	Building Construction, Ely.	B 10	7.30—9.35	..	..	..	..
105	Building Construction, Adv. Builders' Quantities—	B 10	..	7.30—9.35	..	..	..
107	Ordinary	B 10	..	..	7.30—9.35	..	..
108	Honours	B 10	..	..	7.30—9.35	..	Saturday
109	Perspective Drawing ..	B 12	..	..	..	..	2.30—4.30

110	Carpentry and Joinery, Junr.	C 8	..	7.30—9.35	..	..	..
111	Carpentry and Joinery, Inter.	C 8	..	..	..	7.30—9.35	..
112	Carpentry and Joinery, Senior	C 8	7.30—9.35	..	..	..	..
113	Extra Practical ..	C 8	..	..	..	..	7.30—9.35
114	Plumbing, Junior, Lecture	D 10	..	7.30—8.30	..	..	..
115	Practical	D 10	..	8.35—10.5	..	..	..
116	Plumbing, Inter., Lecture	D 10	..	..	..	7.30—8.30	..
117	Drawing	D 10	..	..	..	8.35—9.35	..
118	Practical	D 10	..	..	..	..	7.30—9.35
119	Plumbing, Senior ..	D 10	..	..	7.30—10.5	..	..
COMMERCIAL CLASSES—							
175	Irish, Junior ..	C 1	..	..	..	..	7.30—9.35
176	Irish, Senior ..	C 1	..	..	7.30—9.35	..	..
177	French, Junior A. ..	B 5	7.30—9.35	..	..	..	..
178	French, Junior B. ..	C 1	..	7.30—9.35	..	..	..
179	French, Junior C. ..	C 1	..	..	..	..	4.0—6.5
180	French, Intermediate ..	C 1	..	..	..	7.30—9.35	..
181	French, Senior ..	C 1	7.30—9.35	..	..	..	..
182	German, Junior ..	B 5	..	..	..	..	7.30—9.35
183	German, Senior ..	B 5	..	..	7.30—9.35	..	..
184	Commercial Correspondence						
189	and Arithmetic, Junior A.	B 4	7.30—9.35	..	..	..	..
185	Commercial Correspondence						
190	and Arithmetic, Junior B.	B 4	..	7.30—9.35	..	..	..
186	Commercial Correspondence						
191	and Arithmetic Junior C.	B 4	..	..	7.30—9.35	..	..
187	Commercial Correspondence	B 4	..	..	..	..	..
192	and Arithmetic, Junior D.	B 4	..	..	..	7.30—9.35	..
188	Commercial Correspondence						
193	and Arithmetic, Senior	B 4	..	..	..	..	7.30—9.35
194	Commercial Geography ..	A 1	..	..	..	..	8.35—9.35

TIME TABLE—*continued.*

No. of Class,		No. of Room.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
	COMMERCIAL CLASSES— <i>continued.</i>						
196	Book-keeping, Junior A. ..	A 1	7.30—9.35	..	..	..	..
197	Book-keeping, Junior B. ..	A 1	..	7.30—9.35	..	..	..
198	Book-keeping, Junior C. ..	A 1	..	..	7.30—9.35	..	..
199	Book-keeping, Junior D. ..	A 1	..	..	..	..	7.30—9.35
200	Book-keeping, Inter. A. ..	A 1	..	..	..	7.30—9.35	..
201	Book-keeping, Inter. B. ..	C 5	7.30—9.35	..	..	..	..
202	Book-keeping, Senior ..	C 2	..	7.30—9.35	..	..	..
203	Accountancy, Junior ..	C 2	..	..	..	7.30—9.35	..
204	Business Methods, Junior A.,	A 1	..	..	7.30—8.30	..	..
205	Business Methods, Junior B.,	A 1	..	..	8.35—9.35	..	..
206	Business Methods, Intermed.	A 1	..	8.35—9.35	..	..	..
207	Business Methods, Senior ..	C 6	..	..	..	8.35—9.35	..
208	Shorthand, Junior A. ..	A 10	..	..	7.30—9.35	..	..
209	Shorthand, Junior B. ..	A 10	..	..	..	7.30—9.35	..
210	Shorthand, Junior C., Girls only ..	A 10	7.30—9.35	..	..	..	..
211	Shorthand, Junior D. ..	C 5	..	7.30—9.35	..	..	..
212	Shorthand, Intermediate A.	A 10	..	..	..	..	7.30—9.35
213	Shorthand, Intermediate B.	C 5	..	..	..	7.30—9.35	..
214	Shorthand, Senior ..	A 10	..	7.30—9.35	..	..	..
215	Shorthand, Junior Speed ..	C 2	..	..	..	..	7.30—9.35
216	Shorthand, Inter. Speed, ..	C 2	..	..	7.30—9.35	..	..
217	Shorthand, Senior Speed ..	C 2	7.30—9.35	..	..	..	..
218	Shorthand, Special ..	C 4	7.0—10.5	7.0—10.5	7.0—10.5	7.0—10.5	7.0—10.5
220	Typewriting, Junior ..	C 3	7.0—10.5	..	7.0—10.5	..	7.0—10.5
223	Typewriting, Intermediate	C 3	..	7.0—10.5	..	..	..
224	Typewriting, Senior ..	C 3	..	..	..	7.0—10.5	..

TIME TABLE OF PRINTING SCHOOL, BOLTON STREET.

PRINTING SCHOOL.						
PRACTICAL TYPOGRAPHY.						
270	Compositors—	Elementary	8.0—10.5	..	..	..
272		Extra Practical	..	8.0—10.5	..	..
273		Intermediate	..	..	8.0—10.5	..
275		Extra Practical	..	..	8.0—10.5	..
276		Advanced	..	..	8.0—10.5	..
277		Extra Practical	..	..	8.0—10.5	..
280	Machinists—	Elementary	..	8.0—10.5	..	..
282		Intermediate	..	..	8.0—10.5	..
283		Extra Practical	..	..	8.0—10.5	..
284		Advanced	..	..	8.0—10.5	..
285		Extra Practical	..	..	8.0—10.5	..
287	Linotype, Demonstration,	Elem.	..	8.0—10.5	..	..
289		Advan.	..	..	8.0—10.5	..
288	Linotype, Practice—	Elem.	8.0—10.5	..	..	..
290		Advan.	..	..	8.0—10.5	..
292	Technical Calculations,	Elem.	..	..	8.0—9.0	..
293	English,	Elem.	..	..	9.5—10.5	..
294	Technical Calculations,	Inter.	..	8.0—9.0	..	..
295	English,	Inter.	..	9.5—10.5	..	..
296	Technical Calculations	Advan.	8.0—9.0	..	..	..
297	English	Advan.	9.5—10.5	..	..	..
298	Drawing—	Elem.	..	..	9.5—10.5	9.5—10.5
300	Drawing	Advan.	..	..	8.0—9.0	8.0—9.0
PRINTING CLASSES.						
AFTERNOON.						
306	Compositors' Practical Work	..	4.0—6.0	..	..	..
307	Linotype .. ..	..	4.0—6.0	..	..	..
308	English, .. ..	..	..	..	4.0—5.0	..
309	Technical Calculations	..	..	..	5.0—6.0	..
310	Drawing .. ..	..	..	..	5.0—6.0	..

LIST OF CLASSES.

NO. OF CLASS	SUBJECT.	ROOM.	TEACHER.	DAY.	HOUR.	BUILDING.
1	Preliminary Course—A— Elementary Mathematics	28	Mr. M. A. Hartnett	Tuesday ..	7.30—8.30	Kevin Street
2	English	28	Mr. M. A. Hartnett	Tuesday ..	8.35—9.35	do.
3	Drawing	14	Mr. W. L. Whelan	Friday ..	7.30—8.30 <i>or</i>	do.
4		14	Mr. W. Millard ..	Friday ..	8.35—9.35	do.
	Preliminary Course—B—					
5	Elementary Mathematics	C. 5	Mr. A. Manly ..	Wednesday	7.30—8.30	Bolton Street
6	English	C. 5	Mr. A. Manly ..	Wednesday	8.35—9.35	do.
7	Drawing	A. 3	Mr. C. E. Lodge ..	Friday ..	7.30—8.30 <i>or</i>	do.
8		A. 3	Mr. C. E. Lodge ..	Friday ..	8.35—9.35	do.
	Preliminary Course—C—					
9	Elementary Mathematics	A. 3	Mr. Michael Hayes	Wednesday	7.30—8.30	Bolton Street
10	English	A. 3	Mr. Michael Hayes	Wednesday	8.35—9.35	do.
11	Drawing	A. 3	Mr. C. E. Lodge ..	Friday ..	7.30—8.30 <i>or</i>	do.
12		A. 3	Mr. C. E. Lodge ..	Friday ..	8.35—9.35	do.
	Introductory Course—D.—					
13	Elementary Mathematics	28	Mr. M. A. Hartnett	Thursday	7.30—8.30	Kevin Street
14	English	28	Mr. M. A. Hartnett	Thursday	8.35—9.35	do.
15	Drawing	14	Mr. W. L. Whelan	Monday ..	7.30—8.30 <i>or</i>	do.
16		14	Mr. W. Millard ..	Monday ..	8.35—9.35	do.
	Introductory Course—E.—					
17	Elementary Mathematics	A. 3	Mr. Michael Hayes	Tuesday ..	7.30—8.30	Bolton Street
18	English	A. 3	Mr. Michael Hayes	Tuesday ..	8.35—9.35	do.
19	Drawing, Class A. ..	A. 3	Mr. C. E. Lodge ..	Mo day ..	7.30—8.30 <i>or</i>	do.
20	„ Class B. ..	A. 3	Mr. C. E. Lodge ..	Monday ..	8.35—9.35	do.

	Introductory Course—F—					
21	Elementary Mathematics	A. 3	Mr. Michael Hayes	Thursday	7.30—8.30	Bolton Street
22	English	A. 3	Mr. Michael Hayes	Thursday	8.35—9.35	do.
23	Drawing, Class A. ..	A. 3	Mr. C. E. Lodge ..	Monday ..	7.30—8.30 <i>or</i>	do.
24	„ Class B. ..	A. 3	Mr. C. E. Lodge ..	Monday ..	8.35—9.35	do.
	Workshop Mathematics—					
25	Stage 1.	24	Mr. A. Donnelly	Friday ..	7.30—8.30	Kevin Street
26	Stage 2.	24	Mr. A. Donnelly	Friday ..	8.35—9.35	do.
	Technical Mathematics—					
27	Stage 1,	B. 3	Mr. R. V. Walker	Thursday	7.30—8.30	Bolton Street
28	Stage 2,	B. 3	Mr. R. V. Walker	Thursday	8.35—9.35	do.
	Engineering Mathematics—					
29	Stage 1,	B. 3	Mr. R. V. Walker	Wednesday	7.30—8.30	Bolton Street
30	Stage 2,	B. 3	Mr. R. V. Walker	Wednesday	8.35—9.35	do.
	Practical Mathematics—					
31	Stage 1,	B. 3	Mr. R. V. Walker	Monday ..	7.30—9.35	Bolton Street
32	Stage 2,	B. 3	Mr. R. V. Walker	Friday ..	7.30—9.35	do.
33	Stage 3,	B. 3	Mr. R. V. Walker	Tuesday ..	7.30—9.35	do.
	Pure Mathematics—					
34	Stage 1,	28	Mr. M. A. Hartnett	Friday ..	7.30—9.35	Kevin Street
35	Stage 2,	16	Mr. M. A. Hartnett	Tuesday ..	7.30—9.35	do.
36	Stage 3,	16	Mr. P. A. E. Dowling	Monday ..	7.30—9.35	do.
36	Stage 3,	16	Mr. P. A. E. Dowling	Friday ..	7.30—8.30	do.
37	Stage 4,	24	Mr. A. Donnelly ..	Wednesday	7.30—9.35	do.
38	Stage 5,	16	Mr. P. A. E. Dowling	Wednesday	7.30—9.35	do.
38	Stage 5,	16	Mr. P. A. E. Dowling	Friday ..	8.35—9.35	do.

LIST OF CLASSES—*continued.*

NO. OF CLASS.	SUBJECT.	ROOM.	TEACHER.	DAY.	HOUR.	BUILDING.
39	Theoretical Mechanics— Elementary	28	Mr. M. A. Hartnett	Monday ..	7.30—9.35	Kevin Street
40	Advanced	28	Mr. M. A. Hartnett	Wednesday	7.30—9.35	do.
41	Mathematical Physics— Elementary	16	Mr. A. Donnelly ..	Tuesday ..	7.30—9.35	Kevin Street
42	Advanced	16	Mr. A. Donnelly ..	Thursday	7.30—9.35	do.
43	Physics, Junior— Lecture A.	12	Mr. W. J. Lyons ..	Monday ..	7.30—8.30	Kevin Street
44	Laboratory A.	8-10	Mr. W. J. Lyons .. Mr. C. J. Sansom .. Mr. E. Moynihan ..	Monday ..	8.35 10.5	do.
45	Lecture B.	12	Mr. C. Sansom ..	Tuesday ..	7.30—8.30	Kevin Street
46	Laboratory B.	8-10	Mr. C. J. Sansom Mr. J. Enright	Tuesday ..	8.35—10.5	do.
47	Physics, Intermediate— Lecture	12	Mr. J. Enright ..	Thursday	7.30—8.30	Kevin Street
48	Laboratory	8-10	Mr. W. J. Lyons Mr. C. J. Sansom Mr. E. Moynihan	Thursday	8.35—10.5	do.
49	Physics, Senior— Lecture	12	Mr. W. J. Lyons ..	Thursday	7.30—8.30	Kevin Street
50	Laboratory	8-10	Mr. W. J. Lyons .. Mr. E. Moynihan	Thursday	8.35—10.5	do.

Magnetism and Electricity—						
Junior—						
51	Lecture A.	B. 8	Mr. W. J. Lyons	Tuesday ..	7.30—8.30	Bolton Street
52	Laboratory A.	B. 7	Mr. W. J. Lyons Mr. E. Moynihan	Tuesday	8.35—10.5	do.
53	Lecture B.	B. 8	Mr. J. Enright	Friday ..	7.30—8.30	do.
54	Laboratory B.	B. 7	Mr. E. Moynihan Mr. J. Enright	Friday ..	8.35—10.5	do.
Magnetism and Electricity, Intermediate—						
55	Lecture	12	Mr. W. J. Lyons	Wednesday	7.30—8.30	Kevin Street
56	Laboratory	8-10	Mr. W. J. Lyons Mr. C. J. Sansom	Wednesday	8.35—10.5	do.
Magnetism and Electricity, Senior—						
57	Lecture	12	Mr. W. J. Lyons	Friday ..	7.30—8.30	do.
58	Laboratory	8-10	Mr. W. J. Lyons	Friday ..	8.35—10.5	do.
Inorganic Chemistry, Ele- mentary—						
60	Lecture	25	Mr. M. J. O'Connor	Wednesday	7.30—8.30	do.
61	Laboratory	22	Mr. M. J. O'Connor	Tuesday	7.30—10.5	do.
Inorganic Chemistry, Ad- vanced—						
62	Lecture	25	Mr. P. B. Foy ..	Monday ..	7.30—8.30	do.
63	Laboratory	21	Mr. P. B. Foy .. Mr. J. J. Hutchinson	Monday ..	8.35—10.5	do.

LIST OF CLASSES—*continued.*

NO. OF CLASS.	SUBJECT.	ROOM.	TEACHER.	DAY.	HOUR.	BUILDING.
	Inorganic Chemistry, Advanced—					
63	Laboratory	21	Mr. P. B. Foy .. Mr. J. J. Hutchinson	Tuesday ..	7.30—10.5	Kevin Street
63	Laboratory	21	Mr. P. B. Foy .. Mr. B. G. Fagan ..	Wednesday	7.30—10.5	do.
	Organic Chemistry, Elementary—					
64	Lecture	25	Mr. J. J. Hutchinson	Thursday	7.30—8.30	do.
65	Laboratory	21	Mr. J. J. Hutchinson	Thursday	8.35—10.5	do.
65	Laboratory	21	Mr. J. J. Hutchinson Mr. M. J. O'Connor	Friday .. Friday ..	8.35—10.5 7.30—8.30	do.
	Organic Chemistry, Advanced—					
66	Lecture	25	Mr. J. J. Hutchinson	Friday ..	7.30—8.30	do.
67	Laboratory	21	Mr. J. J. Hutchinson Mr. M. J. O'Connor	Thursday Thursday	8.35—10.5 7.30—8.30	do.
67	Laboratory	21	Mr. J. J. Hutchinson	Friday ..	8.35—10.5	do.
	Chemistry for Medical Students—					
	Lecture	25	Mr. M. J. O'Connor	Wednesday	7.30—8.30	do.
68	Laboratory	22	Mr. M. J. O'Connor	Thursday	8.35—10.5	do.
68	Laboratory	22	Mr. M. J. O'Connor	Friday ..	8.35—10.5	do.

	Pharmaceutical Chemistry—						
	Lecture	25	Mr. M. J. O'Connor	Wednesday	7.30—8.30	Kevin Street	
69	Laboratory	22	Mr. M. J. O'Connor	Monday ..	7.30—10.5	do.	
69	Laboratory	22	Mr. M. J. O'Connor	Wednesday	8.35—10.5	do.	
70	Botany—Lecture	23	Mr. J. Adams ..	Friday ..	7.30—8.30	do.	
72	Materia Medica—Lecture ..	23	Mr. J. Adams ..	Friday ..	8.35—9.35	do.	
73	Pharmacy—Lecture	23		Thursday	7.30—9.35	do.	
74	Engineering—Junior	A. 5	Mr. E. E. Joynt ..	Tuesday ..	7.30—9.35	Bolton Street	
	Technical Drawing—						
75	Class A.	A. 5	Mr. E. E. Joynt ..	Monday ..	7.30—9.35	do.	
76	Class B.	A. 5	Mr. E. E. Joynt ..	Wednesday	7.30—9.35	do.	
	Practical Geometry—						
77	Elementary	A. 5	Mr. C. B. Outon	Friday ..	7.30—9.35	do.	
			Mr. R. J. Dowling				
78	Advanced	A. 5	Mr. C. B. Outon	Friday ..	7.30—9.35	do.	
			Mr. R. J. Dowling				
	Machine Drawing—						
79	Elementary	A. 5	Mr. C. B. Outon ..	Thursday	7.30—9.35	do.	
			Mr. E. E. Joynt				
80	Advanced	A. 5	Mr. C. B. Outon ..	Thursday	7.30—9.35	do.	
			Mr. E. E. Joynt				
81	Engine and Machine Design	A. 4	Mr. C. B. Outon ..	Tuesday ..	7.30—9.35	do.	
	Applied Mechanics—						
82	Elementary—Lecture ..	A. 8	Mr. John Taylor ..	Tuesday ..	7.30—8.30	do.	
	Laboratory	C. 6	Mr. John Taylor ..	Tuesday ..	8.35—10.5	do.	
	Heat Engines—						
83	Elementary—Lecture ..	A. 8	Mr. John Taylor ..	Thursday	7.30—8.30	do.	
	Laboratory	A. 6	Mr. John Taylor ..	Thursday	8.35—10.5	do.	

LIST OF CLASSES—*continued.*

NO. OF CLASS.	SUBJECT.	ROOM.	TEACHER.	DAY.	HOUR.	BUILDING.
84	Applied Mechanics—					
	Advanced—Lecture ..	A. 8	Mr. John Taylor ..	Wednesday	7.30—8.30	Bolton Street
	Laboratory	C. 6	Mr. John Taylor ..	Wednesday	8.35—10.5	do.
85	Heat Engines—					
	Advanced—Lecture ..	A. 8	Mr. John Taylor ..	Friday ..	7.30—8.30	do.
	Laboratory	A. 6	Mr. John Taylor ..	Friday ..	8.35—10.5	do.
86	Structural Design ..	A. 8	Mr. John Taylor ..	Monday ..	7.30—9.35	do.
87	Surveying	C. 10	Mr. R. W. Taylor	Tuesday	7.30—9.35	do.
88	Aeroplane Modelling ..	C. 10		M. W. F.	7.30—9.35	do.
89	Mechanical Engineering—					
	Workshop	D. 7	Mr. R. J. Dowling <i>Assistants :</i> Mr. P. Puzsau Mr. M. Reilly, Mr. J. Manning	M. Tu. W. Th.	7.30—9.35	do.
90	Smith's Work	6	Mr. H. Taylor,	M. & Frid.	7.30—9.35	Kevin Street
91	Brass Finishers	7	Mr. J. T. Duignan	Wednesday	7.30—9.35	do.
	Electrical Wiring and Fitting—					
92	Lecture	C. 9	Mr. J. P. Tierney	Monday	7.30—8.30	Bolton Street
93	Laboratory	D. 3	Mr. J. P. Tierney	Monday ..	8.35—10.5	do.
			Mr. John Rothwell	Friday	7.30—9.35	do.
	Electrical Cable Jointing—					
95	Lecture	B. 8	Mr. T. Tomlinson ..	Mon. & Thu.	7.30—9.35	do.
94	Laboratory	D. 3	Mr. J. P. Tierney	Friday and	7.30—9.35	do.
			Mr. John Rothwell	Tuesday	7.30—9.35	do.

	Electrical Engineering, Junior—						
95	Lectures	B. 8	Mr. T. Tomlinson..	Mon. & Thu.	7.30—8.30	Bolton Street	
96	Laboratory	D. 5	Mr. T. Tomlinson..	Monday and	8.35—10.5	do.	
96	Laboratory	D. 5	Mr. T. Tomlinson..	Thursday	8.35—10.5	do.	
			Mr. J. P. Tierney	Thursday			
	Electrical Engineering, Intermediate--						
97	Lecture	B. 8	Mr. T. Tomlinson..	Wednesday	7.30—8.30	do.	
98	Laboratory	D. 5	Mr. T. Tomlinson..	Wednesday	8.35—10.5	do.	
			Mr. J. P. Tierney				
	Electrical Engineering Senior—						
99	Lecture	C. 9	Mr. T. Tomlinson..	Tuesday ..	7.30—8.30	do.	
100	Laboratory	D. 5	Mr. T. Tomlinson..	Tuesday ..	8.35—10.5	do.	
			Mr. J. P. Tierney				
103	Technical Drawing for Building Trades.		B. 12	Mr. M. J. Burke ..	Wednesday	7.30—9.35	do.
104	Building Construction-- Elementary		B. 10	Mr. R. Coulson ..	Monday ..	7.30—9.35	do.
			Mr. M. J. Burke				
105	Advanced		B. 10	Mr. R. Coulson ..	Tuesday ..	7.30—9.35	do.
			Mr. M. J. Burke				
	Builders' Quantities—						
107	Ordinary	B. 10	Mr. R. Coulson ..	Wednesday	7.30—9.35	do.	
108	Honours	B. 10	Mr. R. Coulson ..	Wednesday	7.30—9.35	do.	
109	Perspective Drawing for Builders.		B. 12	Mr. M. J. Burke ..	Saturday..	2.30—4.30	do.

LIST OF CLASSES—*continued.*

NO. OF CLASS.	SUBJECT.	ROOM.	TEACHER.	DAY.	HOUR.	BUILDING.
	Carpentry and Joinery—					
110	Junior	C. 8	————	Tuesday ..	7.30—9.35	Bolton Street
111	Intermediate	C. 8	————	Thursday ..	7.30—9.35	do.
112	Senior	C. 8	————	Monday ..	7.30—9.35	do.
113	Extra Practical	C. 8	————	Friday ..	7.30—9.35	do.
	Plumbing—					
114	Junior—Lecture	D. 10	Mr. John Bolton ..	Tuesday ..	7.30—8.30	do.
115	Practical	D. 10	Mr. John Bolton ..	Tuesday ..	8.35—10.5	do.
116	Intermediate—Lecture	D. 10	Mr. John Bolton ..	Thursday ..	7.30—8.30	do.
117	Drawing	D. 10	Mr. John Bolton ..	Thursday ..	8.35—9.35	do.
118	Practical	D. 10	Mr. John Bolton ..	Friday ..	7.30—9.35	do.
119	Senior—Dem. & Pracl.	D. 10	Mr. John Bolton ..	Wednesday ..	7.30—10.5	do.
	Plasterers' Work—					
120	Junior	1	Mr. James Saunders	Thursday ..	7.30—9.35	Kevin Street
121	Senior	1	Mr. James Saunders	Wednesday ..	7.30—9.35	do.
	Painters' and Decorators' Work—					
122	Junior Class	30	Mr. Thomas Markey	Thursday ..	7.30—9.35	do.
	Extra Practical	30	Mr. Thomas Markey	Friday ..	7.30—9.35	do.
123	Intermediate Class	30	Mr. Thomas Markey	Tuesday ..	7.30—9.35	do.
124	Senior—Lecture	30	Mr. W. F. Nagle ..	Monday ..	7.30—8.30	do.
125	Practical	30	Mr. W. F. Nagle ..	Monday ..	8.35—9.35	do.
125	Practical	30	Mr. W. F. Nagle ..	Wednesday ..	7.30—9.35	do.
	Drawing for Painters—					
126	Advanced	30	Mr. W. F. Nagle ..	Friday ..	7.30—9.35	do.

127	Theory for Painters— Junior	30	Mr. Joseph King ..	Wednesday	7.30—9.35	Kevin Street
	Metal Plate Work—					
128	Junior—Lecture	5	Mr. George Pappin	Tuesday ..	7.30—8.30	do.
129	Drawing	5	Mr. George Pappin	Tuesday ..	8.35—9.35	do.
132	Practical	5	Mr. George Pappin	Thursday	7.30—9.35	do.
130	Senior—Lecture	5	Mr. George Pappin	Monday ..	7.30—8.30	do.
131	Drawing	5	Mr. George Pappin	Monday ..	8.35—9.35	do.
133	Practical	5	Mr. George Pappin	Wednesday	7.30—9.35	do.
	Cabinetmakers' Work—					
134	Junior	9	Mr. James Hicks ..	Tuesday ..	7.30—9.35	do.
135	Intermediate	9	Mr. James Hicks ..	Wednesday	7.30—9.35	do.
136	Senior	9	Mr. James Hicks ..	Monday ..	7.30—9.35	do.
	Extra Practical	9	Mr. James Hicks ..	Thursday	7.30—9.35	do.
	Tailors' Cutting—					
137	Junior	15	Mr. John Byrne ..	Thursday	7.30—9.35	do.
138	Intermediate	15	Mr. John Byrne ..	Friday ..	7.30—9.35	do.
139	Senior	15	Mr. John Byrne ..	Tuesday ..	7.30—9.35	do.
	Hairdressers' Work—					
140	Junior	15	Mr. Joseph Addison Mr. John Lacy ..	Monday ..	8.35—10.5	do.
141	Senior	15	Mr. Joseph Addison Mr. John Lacy ..	Wednesday	8.35—10.5	do.
	Boot and Shoemaking—					
142	Junior	3	Mr. Edward Leonard	Tuesday ..	7.30—9.35	do.
143	Intermediate	3	Mr. Edward Leonard	Thursday	7.30—9.35	do.
144	Senior	3	Mr. Edward Leonard	Monday ..	7.30—9.35	do.
	Manual Instruction—					
145	Wood—Junior	4	Mr. T. W. Thornton	Wednesday	7.30—9.35	do.
146	Senior	4	Mr. T. W. Thornton	Monday ..	7.30—9.35	do.
147	Metal	6	—	Friday ..	7.30—9.35	do.

LIST OF CLASSES—*continued.*

NO. OF CLASS.	SUBJECT.	ROOM.	TEACHER.	DAY.	HOUR.	BUILDING.
150	Freehand Drawing ..	14	Mr. William Millard Mr. William Millard	Thursday Friday ..	7.30—9.35 7.30—9.35	Kevin Street do.
151	Model Drawing ..	14	Mr. William Millard	Wednesday	7.30—9.35	do.
152	Geometrical Drawing ..	14	Mr. W. L. Whelan Mr. William Millard	Tuesday ..	7.30—9.35	do.
	Light and Shade Drawing—					
153	Junior	14	Mr. J. J. Burke ..	Monday ..	7.30—9.35	do.
154	Senior	14	Mr. J. J. Burke ..	Wednesday	7.30—9.35	do.
155	Plant and Memory Drawing	14	Mr. W. L. Whelan	Wednesday	7.30—9.35	do.
156	Brushwork and Painting of Ornament.	14	Mr. W. L. Whelan	Monday ..	7.30—9.35	do.
	Design—					
157	Elementary	14	Mr. W. L. Whelan	Thursday	7.30—9.35	do.
158	Advanced	14	Mr. W. L. Whelan	Friday ..	7.30—9.35	do.
159	Design applied to Crafts ..	14	Mr. W. L. Whelan	Thursday	7.30—9.35	do.
	Modelling—					
160	Junior	2	Mr. T. J. Mathers	Monday ..	7.30—9.35	do.
161	Senior	2	Mr. T. J. Mathers	Wednesday	7.30—9.35	do.
162	Stone and Marble Carving	2	Mr. T. J. Mathers	Friday ..	7.30—9.35	do.

Woodcarving—						
163	Junior	.. ..	18	Mr. John Milligan	Thursday	7.30—9.35 Kevin Street
164	Intermediate	.. ..	18	Mr. John Milligan	Tuesday ..	7.30—9.35 do.
165	Senior	.. ..	18	Mr. John Milligan	Monday ..	7.30—9.35 do.
166	Extra Practical	.. ..	18	Mr. John Milligan	Wednesday	7.30—9.35 do.
167	Enamelling on Metal	.. ..	17	Mr. W. L. Whelan	Friday ..	7.30—9.35 do.
Decorative and Ornamental Ironwork.			6	Mr. H. Taylor ..	Tuesday ..	7.30—9.35 do.
			6	Mr. H. Taylor ..	Thursday	7.30—9.35 do.
Cookery—						
230	Afternoon	.. ..	20	Miss M. B. Todd	Tuesday ..	3.0—5.5 Kevin Street
231	Lecture	.. ..	25	Miss M. B. Todd	Tuesday ..	7.30—9.35 do.
232	Junior—Practical—A.	.. ..	20	Miss M. B. Todd	Monday ..	7.30—9.35 do.
233	Practical—B.	.. ..	20	Miss M. B. Todd	Wednesday	7.30—9.35 do.
234	Senior—Practical	.. ..	20	Miss M. B. Todd	Thursday	7.30—9.35 do.
				with Miss K. O'Sullivan		
236	Junior—Afternoon	.. ..	3	Miss K. Clancy ..	Monday ..	3.0—5.5 Rutland Sq.
237	Senior—Afternoon	.. ..	3	Miss K. Clancy ..	Wednesday	3.0—5.5 do.
238	Junior—Lecture	.. ..	3	Miss K. Clancy ..	Monday ..	7.30—9.35 do.
239	Senior—Lecture	.. ..	3	Miss K. Clancy ..	Wednesday	7.30—9.35 do.
240	Junior—Practical	.. ..	3	Miss K. Clancy ..	Tuesday ..	7.30—9.35 do.
241	Senior—Practical	.. ..	3	Miss K. Clancy ..	Thursday	7.30—9.35 do.
				with Miss M. J. Doyle.		
Dressmaking—						
244	Junior—Afternoon	.. ..	4	Miss K. M. Murphy	Monday ..	3.0—5.5 Chatham Row
245	Senior—Afternoon	.. ..	4	Miss K. M. Murphy	Friday ..	3.0—5.5 do.
246	Junior	.. ..	4	Miss K. M. Murphy	Monday ..	7.30—9.35 do.
				Miss A. Clarke ..		
247	Senior	.. ..	4	Miss K. M. Murphy	Friday ..	7.30—9.35 do.
				Miss A. Clarke ..		
248	Afternoon	.. ..	5	Miss K. M. Murphy	Thursday	3.0—5.5 Rutland Sq.
249	Junior	.. ..	5	Miss K. M. Murphy	Wednesday	7.30—9.35 do.
250	Senior	.. ..	5	Miss K. M. Murphy	Thursday	7.30—9.35 do.

LIST OF CLASSES—*continued.*

NO. OF CLASS.	SUBJECT.	ROOM.	TEACHER.	DAY.	HOOR.	BUILDING.
	Needlework—					
252	Afternoon	5	Miss K. Doyle ..	Monday ..	3.0—5.5	Rutland Square
253	Junior	4	Miss K. Doyle ..	Tuesday ..	7.30—9.35	Chatham Row
254	Senior	4	Miss K. Doyle ..	Thursday	7.30—9.35	do.
255	Junior	5	Miss K. Doyle ..	Friday ..	7.30—9.35	Rutland Sq.
256	Senior	5	Miss K. Doyle ..	Monday ..	7.30—9.35	do.
	Millinery—					
259	Junior	4	Miss R. Sharpe ..	Thursday	7.30—9.35	do.
260	Senior	4	Miss R. Sharpe ..	Tuesday ..	7.30—9.35	do.
	Irish—					
175	Junior	C. 1.	Mr. Denis Lynch ..	Friday ..	7.30—9.35	Bolton Street
176	Senior	C. 1	Mr. Denis Lynch ..	Wednesday	7.30—9.35	do.
	French—					
177	Junior—A.	B. 5	Mr. Michael Hayes	Monday ..	7.30—9.35	do.
178	Junior—B.	C. 1	Mr. Denis Lynch ..	Tuesday ..	7.30—9.35	do.
179	Junior—C.	C. 1	Mr. Denis Lynch ..	Friday ..	4.0—6.5	do.
180	Intermediate	C. 1	Mr. Denis Lynch ..	Thursday ..	7.30—9.35	do.
181	Senior	C. 1	Mr. Denis Lynch ..	Monday ..	7.30—9.35	do.
	German—					
182	Junior	B. 5	Mr. M. P. Crinion	Friday ..	7.30—9.35	do.
183	Senior	B. 5	Mr. M. P. Crinion	Wednesday	7.30—9.35	do.

	Commercial Correspondence.						
184	Junior—A.	.. ..	B. 4	Mr. D. K. Leahy	Monday ..	7.30—8.30	Bolton Street
185	Junior—B.	.. ..	B. 4	Mr. D. K. Leahy	Tuesday ..	7.30—8.30	do.
186	Junior—C.	.. ..	B. 4	Mr. D. K. Leahy	Wednesday	7.30—8.30	do.
187	Junior—D.	.. ..	B. 4	Mr. D. K. Leahy	Thursday	7.30—8.30	do.
188	Senior	.. ..	B. 4	Mr. D. K. Leahy	Friday ..	7.30—8.30	do.
	Commercial Arithmetic—						
189	Junior—A.	.. ..	B. 4	Mr. D. K. Leahy	Monday ..	8.35—9.35	do.
190	Junior—B.	.. ..	B. 4	Mr. D. K. Leahy	Tuesday ..	8.35—9.35	do.
191	Junior—C.	.. ..	B. 4	Mr. D. K. Leahy	Wednesday	8.35—9.35	do.
192	Junior—D.	.. ..	B. 4	Mr. D. K. Leahy	Thursday	8.35—9.35	do.
193	Senior	.. ..	B. 4	Mr. D. K. Leahy	Friday ..	8.35—9.35	do.
194	Commercial Geography	..	A. 1	Mr. Martin Wheeler	Friday ..	8.35—9.35	do.
	Book-keeping—						
196	Junior—A.	.. ..	A. 1	Mr. Michael Morrissey	Monday ..	7.30—9.35	do.
197	Junior—B.	.. ..	A. 1	Mr. Michael Morrissey	Tuesday ..	7.30—9.35	do.
198	Junior—C.	.. ..	A. 1	Mr. Michael Morrissey	Wednesday	7.30—9.35	do.
199	Junior—D.	.. ..	A. 1	Mr. Michael Morrissey	Friday ..	7.30—9.35	do.
200	Intermediate—A.	.. ..	A. 1	Mr. Michael Morrissey	Thursday	7.30—9.35	do.
201	Intermediate—B.	.. ..	C. 5	Mr. M. F. Flood ..	Monday ..	7.30—9.35	do.
202	Senior	.. ..	C. 2	Mr. M. F. Flood ..	Tuesday ..	7.30—9.35	do.
203	Accountancy—Junior	..	C. 2	Mr. M. F. Flood ..	Thursday	7.30—9.35	do.
	Business Methods—						
204	Junior—A.	.. ..	A. 1	Mr. Martin Wheeler	Wednesday	7.30—8.30	do.
205	Junior—B.	.. ..	A. 1	Mr. Martin Wheeler	Wednesday	8.35—9.35	do.
206	Intermediate	.. ..	A. 1	Mr. Martin Wheeler	Tuesday ..	8.35—9.35	do.
207	Senior	.. ..	A. 1	Mr. Martin Wheeler	Thursday	8.35—9.35	do.
	Shorthand—						
208	Junior—A.	.. ..	A. 10	Mr. F. C. Wallis-Healy Mr. M. Quane	Wednesday	7.30—9.35	do.

LIST OF CLASSES—continued.

NO. OF CLASS.	SUBJECT.	ROOM.	TEACHER.	DAY.	HOOR.	BUILDING.
209	Shorthand— Junior—B.	A. 10	Mr. F. C. Wallis-Healy Mr. M. Quane	Thursday	7.30—9.35	Bolton Street
210	Junior—C. (Girls only) ..	A. 10	Mr. F. C. Wallis-Healy	Monday ..	7.30—9.35	do.
211	Junior—D.	C. 5	Mr. M. Quane ..	Tuesday ..	7.30—9.35	do.
212	Intermediate—A.	A. 10	Mr. F. C. Wallis-Healy Mr. M. Quane ..	Friday ..	7.30—9.35	do.
213	Intermediate—B.	C. 5	Mr. M. F. Boyle ..	Thursday	7.30—9.35	do.
214	Senior	A. 10	Mr. F. C. Wallis-Healy Mr. M. F. Boyle ..	Tuesday ..	7.30—9.35	do.
215	Junior—Speed	C. 2	Mr. M. F. Boyle ..	Friday ..	7.30—9.35	do.
216	Intermediate—Speed ..	C. 2	Mr. M. F. Boyle ..	Wednesday	7.30—9.35	do.
217	Senior—Speed	C. 2	Mr. M. F. Boyle ..	Monday ..	7.30—9.35	do.
218	Special for Typewriters	C. 4	Mr. A. Manly ..	M. Tu. W. Th. Fr.	7.0—10.5	do.
	Typewriting—					
220	Junior—A.	C. 3	Miss C. Moran ..	Monday ..	7.0—10.5	Bolton Street
221	Junior—B.	C. 3	Miss C. Moran ..	Wednesday	7.0—10.5	do.
222	Junior—C.	C. 3	Miss C. Moran ..	Friday ..	7.0—10.5	do.
223	Intermediate	C. 3	Mr. James O'Shea	Tuesday ..	7.0—10.5	do.
224	Senior	C. 3	Mr. James O'Shea	Thursday	7.0—10.5	do.
	PRINTING.					
	<i>Compositors :</i>					
	Elementary—					
270	Lecture and	C. 9	—	Monday ..	8.0—9.0	Bolton Street
	Practical	D. 8	—	Monday ..	9.5—10.5	do.
272	Extra Practical	D. 8	—	Tuesday ..	8.0—10.5	do.

273	Intermediate— Lecture and Practical	B. 5 D. 8	— —	Thursday ..	8.0—9.0	Bolton Street
275	Extra Practical ..	D. 8	—	Thursday Wednesday	9.5—10.5 8.0—10.5	do. do.
276	Advanced— Practical ..	D. 8	—	Wednesday	8.0—10.5	do.
277	Extra Practical ..	D. 8	—	Thursday	8.0—10.5	do.
<i>Machinists.</i>						
280	Elementary— Lecture and Practical	B. 5 D. 8	— —	Tuesday .. Tuesday ..	8.0—10.5 —	do. do.
282	Intermediate— Practical ..	D. 8	—	Thursday	8.0—10.5	do.
283	Extra Practical ..	D. 8	—	Wednesday	8.0—10.5	do.
284	Advanced— Practical ..	D. 8	—	Wednesday	8.0—10.5	do.
285	Extra Practical ..	D. 8	—	Thursday	8.0—10.5	do.
<i>Linotype.</i>						
287	Elementary— Demonstration ..	D. 8	Mr. R. A. Latchford	Tuesday ..	8.0—10.5	do.
288	Practical ..	D. 8	Mr. R. A. Latchford	Monday ..	8.0—10.5	do.

LIST OF CLASSES—*continued.*

NO. OF CLASS.	SUBJECT.	ROOM.	TEACHER.	DAY.	HOUR.	BUILDING.
	<i>Linotype.</i>					
289	Advanced— Demonstration ..	D. 8	Mr. R. A. Latchford	Thursday	8.0—10.5	Bolton Street
290	Practical ..	D. 8	Mr. R. A. Latchford	Wednesday	8.0—10.5	do.
292	Technical Calculations— Elementary	C. 11	Mr. M. Hanly ..	Thursday	8.0—9.0	do.
293	English—Elementary ..	C. 11	Mr. M. Hanly ..	Thursday	9.5—10.5	do.
294	Technical Calculations— Intermediate ..	C. 11	Mr. M. Hanly ..	Tuesday ..	8.0—9.0	do.
295	English—Intermediate ..	C. 11	Mr. M. Hanly ..	Tuesday ..	9.5—10.5	do.
296	Technical Calculations— Advanced	C. 11	Mr. M. Hanly ..	Monday ..	8.0—9.0	do.
297	English—Advanced ..	C. 11	Mr. M. Hanly ..	Monday ..	9.5—10.5	do.
298	Drawing for Printers— Elementary—A. ..	C. 11	Mr. C. E. Lodge ..	Wednesday	9.5—10.5	do.
299	Elementary—B. ..	C. 11	Mr. C. E. Lodge ..	Friday ..	9.5—10.5	do.
300	Advanced—A. ..	C. 11	Mr. C. E. Lodge ..	Wednesday	8.0—9.0	do.
301	Advanced—B. ..	C. 11	Mr. C. E. Lodge ..	Friday ..	8.0—9.0	do.

<i>Afternoon.</i>						
306	Compositors' Practical Work	D. 8	—	Monday ..	4.0—6.0	Bolton Street
307	Linotype	D. 8	Mr. R. A. Latchford	Monday ..	4.0—6.0	do.
308	English	C. 11	Mr. M. Hanly ..	Wednesday	4.0—5.0	do.
309	Technical Calculations	C. 11	Mr. M. Hanly ..	Wednesday	5.0—6.0	do.
310	Drawing	D. 9	Mr. C. E. Lodge ..	Wednesday	5.0—6.0	do.

The Afternoon Classes will not be started unless sufficient Students enter before November 1st.

The Fee for a Course in Printing is 5s. 0d. a Session, ending on May 9th. Only Qualified Students are admitted to the Courses, but any Printer whatever may join his Trade Class at the same Fee.

It is possible for former Students to obtain *free admission* to Courses, under conditions explained in the Prospectus and in the Calendar, if they have attended regularly at the earlier stage of the Course.

WIRELESS TELEGRAPHY.

If sufficient Students apply, a Course of twelve lectures in Wireless Telegraphy will be given by Mr. W. L. Lyons, at Bolton Street, on Tuesdays, 8.35 to 9.35, commencing November 5th. Fee, 2s. 6d. for the twelve lectures.

PRELIMINARY COURSE

Preparatory Section.

PRELIMINARY.

ENGLISH.

ELEMENTARY MATHEMATICS.

DRAWING.

Classes will be held both at Kevin Street and at Bolton Street.

INTRODUCTORY.

ENGLISH.

ELEMENTARY MATHEMATICS.

DRAWING.

Classes will be held both at Kevin Street and at Bolton Street.

PRELIMINARY COURSE.

This course is arranged with the object of giving students a sound basis of education preliminary to their entering the Introductory Course.

Each student must attend the three subjects of the group—Elementary Mathematics, English, and Drawing.

Any student who follows the course satisfactorily may be admitted to the Introductory Course, or, if he passes the qualifying examination, to a Specialised Course.

ELEMENTARY MATHEMATICS.

Teachers :

M. A. HARTNETT.

M. HAYES.

Wednesday, 7.30 to 8.30—Bolton Street (General).

Tuesday, 7.30 to 8.30—Kevin Street (Trades).

Wednesday, 7.30 to 8.30—Bolton Street (Commercial).

ARITHMETIC.—Mental arithmetic ; compound rules ; reduction of money, also weights and measures in common use ; G.C.M. and L.C.M. ; vulgar and decimal fractions ; ratio ; simple and compound proportion by the unitary method ; simple interest ; averages and percentages ; square root ; the metric system.

MENSURATION.—Geometrical definitions ; measurements of length ; rectangular areas and volumes in the principal English and French units ; area of parallelogram, triangle, trapezoid, rhombus and circle ; use of squared paper ; exercises on practical measurements.

GEOMETRY.—Angles, triangles, polygons. The measuring and setting out of angles ; sum of angles of a triangle, of angles of a polygon ; angle in a semi-circle ; angles in same segment ; sum of angles of a quadrilateral inscribed in a circle. Set squares, protractor and compass to be used in demonstrating the foregoing.

ENGLISH.

Teachers :

M. A. HARTNETT.
M. HAYES.**Wednesday, 8.35 to 9.35—Bolton Street (General).****Tuesday, 8.35 to 9.35—Kevin Street (Trades).****Wednesday, 8.35 to 9.35—Bolton Street (Commercial).**

GRAMMAR.—The structure of the English sentence.—Parts of a simple sentence ; kind of sentences ; the subordinate sentence and its functions ; analysis of sentences ; the uses and inflections of the parts of speech ; correction of grammatical errors.

COMPOSITION AND SPELLING.—Punctuation and the use of capitals ; specimen essays and outlines ; essays on given subjects ; paraphrasing selected passages ; letters : their heading, arrangement and complimentary close ; dictation of passages previously prepared by students ; transcription.

Students will be required to read aloud in class from a selected reader, with a view to extending their vocabulary and improving their method of speaking.

DRAWING.

Teachers :

W. L. WHELAN.
WILLIAM MILLARD.
C. E. LODGE.**Friday, 7.30 to 8.30, or 8.35 to 9.35—Kevin Street.****Friday, 7.30 to 8.30, or 8.35 to 9.35—Bolton Street.**

The correct use of drawing instruments ; the construction and use of ruler, compasses, set squares, and **T** squares. Simple geometrical problems on straight lines and angles ; simple scales and their construction ; circles and polygons, geometrical patterns. Simple plans and elevations ; how to read and work from plan and elevation. Freehand to a large scale in order to acquire facility in making rapid workmanlike sketches, and working drawings. Simple model drawing ; the application of the principles of model drawing in drawing pieces of furniture, tools and simple common objects. Drawing from dimensioned sketches (panelled door and frame, window, press, desk, girders, bolt head and nuts, etc.). Occasional practice on blackboard and memory drawing.

INTRODUCTORY COURSE.

This course forms an introduction to the Specialised Courses, and is open to students who show by examination or otherwise that they possess sufficient preliminary knowledge.

To qualify for subsequent admission to a special course a student must make satisfactory attendance and progress in the three subjects, viz. :—Elementary Mathematics, English, and Drawing.

Teachers :

M. A. HARTNETT.
M. HAYES.

ELEMENTARY MATHEMATICS.

Tuesday, 7.30 to 8.30—Bolton Street (General).

Thursday, 7.30 to 8.30—Kevin Street (Trades).

Thursday, 7.30 to 8.30—Bolton Street (Commercial).

The Metric System.

Elementary mensuration of the rectangle, triangle, circle, rectangular solids, cylinder, pyramid, cone and sphere. Experimental verification of the formulae. Exercises in both the British and Metric systems of measurement.

Simple proportion and percentages by the unitary method.

The reduction and conversion of weights and measures.

Addition, subtraction, multiplication, and division of decimal and vulgar fractions. Simplification of fractional expressions.

Simple exercises in mental arithmetic. Simple interest; the formulae $\frac{P \times T \times R}{100}$ Problems in finding principal, time and rate.

Evaluation of Equational formulae, such as are used in Engineering practice, by the substitution of numerical values.

Simple equations and problems producing simple equations with one unknown quantity.

Angles, triangles, and polygons. The protractor and its use in finding the magnitude of angles. Angle in a semi-circle. Angle

in a segment of a circle. Equality of alternative and vertically opposite angles. Sum of angles in a triangle. Angles in a quadrilateral inscribed in a circle. Angles in polygons.

Ratio. Comparison of the ratios of the sides of a triangle with that of the sides of a smaller triangle, formed by drawing a line parallel to the base of the first. Division of lines in given ratios. Determination of the ratio of the diagonal of a square to its base; and of the altitude of an equilateral triangle to its base. The comparison of the ratio of the diameters of two circles with that of their circumferences. Meaning of proportion. Expression of proportion by an equation.

Meaning of sine, cosine, and tangent of an angle; their values in simple cases. Construction of angles when the value of the sine, cosine, or tangent is given.

Similar triangles. Determination of mean proportional. Areas of similar figures proportional to the squares of their linear dimensions. The square on the hypotenuse of a right-angled triangle.

Teachers :

M. A. HARTNETT.
M. HAYES.

ENGLISH.

Tuesday, 8.35 to 9.35—Bolton Street (General).

Thursday, 8.35 to 9.35—Kevin Street (Trades).

Thursday, 8.35 to 9.35—Bolton Street (Commercial).

GRAMMAR.—The construction of sentences; the connection of sentences and sequence of tenses.

The principal parts of speech.

Analysis of simple and complex sentences.

Correction of faulty sentences, especially such as are commonly met with; elementary etymology.

READING.

Frequent readings from a selected standard Author.

Dictation of short passages from the Author previously prepared by the Students.

The paraphrasing of extracts from the Author.

The summarising of paragraphs from the Author.

Précis writing of a selected chapter of the book.

Students may be required to read aloud in class from the selected Author, with a view to extending their vocabulary and improving their method of speaking.

COMPOSITION AND SPELLING.—Specimen letters and essays; letters and essays on given subjects, generally of technical or commercial interest; correction of faulty sentences; instruction and exercise in taking notes; dictation and transcription of passages. The writing of complete Essays.

The meaning and origin of the chief prefixes and affixes used in ordinary English writing and speaking. The principal Latin and Greek roots used in such words. The meaning of foreign abbreviations which are in common use.

Teachers :

DRAWING.

W. L. WHELAN.
WILLIAM MILLARD.
G. E. LODGE.

Monday, 7.30 to 8.30, or 8.35 to 9.35 —Kevin Street.

Monday, 7.30 to 8.30, or 8.35 to 9.35—Bolton Street.

Blackboard demonstrations showing the principles of construction and planning of simple freehand patterns to a large scale.

Drawing from large charts or diagrams freehand patterns of simple ornament, letters and common objects.

The correct use of rulers, set-squares, and compasses. The drawing of geometric patterns, borders, and diapers.

Simple model drawing, the Circle at different levels, Cylinder, Cube, Box, Oil Can, &c.

Drawing from dimensioned sketches to scale—a Door, Press, Desk, Cupboard, Chimney-piece, Bolt-head, a Hinge.

Simple patterns and designs based on geometrical forms with freehand fillings.

More advanced freehand drawing; the drawing of common objects and tools.

Memory drawing concurrently with the above, and occasional practice in free-arm drawing.

Mathematics.

WORKSHOP MATHEMATICS.

TECHNICAL MATHEMATICS.

ENGINEERING MATHEMATICS.

PRACTICAL MATHEMATICS.

Stages 1, 2, and 3.

PURE MATHEMATICS.

Stages 1, 2, 3, 4, and 5.

THEORETICAL MECHANICS (Solids).

THEORETICAL MECHANICS (Fluids).

MATHEMATICAL PHYSICS.

WORKSHOP MATHEMATICS.**STAGE 1.**

Lecturer :

A. DONNELLY.**Friday, 7.30 to 8.30.**

ARITHMETIC.—Factors, abbreviations in multiplication and division, measures and multiples, fractions (vulgar and decimal), and contracted methods, square root, ratio, proportion and unitary method, proportional parts, averages and percentages ; Metric and British systems of units, simple technical calculations ; meaning and use of formulæ.

ALGEBRA AND MENSURATION.—Simplification of formulae. Algebraical manipulation. Determination of numerical values of algebraical expressions corresponding to particular values of the variables.

Simple rules in mensuration concerning triangles, circles, and other figures. Practical methods of finding areas and volumes. Determination of weights from volumes when densities are given.

Use of squared paper in plotting statistics ; finding average values, areas and volumes. Determination of laws which exist between related quantities.

Elementary use of Logarithms and of the Slide Rule for practical purposes.

PRACTICAL GEOMETRY.—The construction and use of scales. The plotting of angles by protractor, or by trigonometrical tables. The division of lines into parts in given proportions.

Measurement of angles in degrees and radians. Definitions of sine, cosine and tangent of an angle ; determination of their values by graphical methods.

The construction of a triangle from given data.

The location of points by rectangular co-ordinates.

Construction of circles from specified data. Tangents.

Various methods of defining positions of points, lines, and planes in space.

GRAPHICAL STATICS.—Simple problems on forces acting at a point. The triangle and polygon of force. Simple applications.

STAGE 2.**Friday, 8.35 to 9.35.**

ARITHMETIC.—Decimals by contracted methods, square and cube root, proportion and ratio, variation, rate of loss and gain, simple interest, compound interest law, technical calculations.

GEOMETRY AND MENSURATION.—Simple practical geometry, mensuration of plane figures and of the volumes and surfaces of Cylinder and Cone.

LOGARITHMS.—Meaning, applications, and use of tables. Explanation of Slide Rule.

ALGEBRA AND GRAPHS.—Use of a curve to show varying quantities, barometric charts. Interpolation. The simple rules of Algebra. Simple equations and problems. Simultaneous equations with simple problems to be solved by them. Area of Plane figures by squared paper and by Simpson's rule.

MECHANICS.—Force, energy, and work, Power and horse power. Calculations; Elasticity, stress and strain; forces acting on a point; resultant, equilibrium, graphical constructions, triangle and polygon of force, moments, parallel forces, couples, the lever, efficiency of simple machines, mechanics of the beam.

TECHNICAL MATHEMATICS.**STAGE 1.**

Lecturer :

R. V. WALKER.**Thursday, 7.30 to 8.30.**

Measures, multiples, fractions, decimals, square root, averages, percentages, ratio, unit method.

The Slide Rule in practice, as an aid in calculation.

The Metric System.

ALGEBRA.—Notation, formulæ, algebraical manipulation, simple equations, practical examples, simultaneous equations with exercises.

GRAPHICS.—Plotting of statistics, etc.; interpolation.

GEOMETRY.—Elementary ideas, use of compasses, protractors, etc.; mensuration of triangles, rectangles, and areas generally. Practical methods of finding Areas and Volumes. Mensuration of solids. Determination of Weights from Volumes when Densities are given.

Definition of sine, cosine, and tangent of an angle. Determination of their values by graphical methods.

Elementary mechanics. Graphical representation of Force and Work. Equilibrium of Forces. Triangle and Polygon of Force.

Practical examples.

STAGE 2.

Lecturer :

R. V. WALKER.

Thursday, 8.35. to 9.35.

Indices, Logarithms, use of logarithmic tables, application to Evaluation of Formulæ, use of the Slide Rule.

TRIGONOMETRY.—Functions of an angle. Use of trigonometric tables. Relations between the functions of an Angle. Curve of Sines.

MENSURATION.—Regular Areas and Volumes. Squared Paper : Plotting of Statistics, etc. : the Straight Line. Slope : the Quadratic Expression. Slope of Curve : Rates of Increase : application of Simpson's Rule to Irregular Areas and Mean Values.

MECHANICS.—Force, Velocity, and Acceleration. Energy, Work, and Power. Horse-power. Mass, Weight, and Specific Gravity. Statics : Composition and Resolution of Forces : Equilibrium of Forces. Couples. Parallel Forces. Forces acting on a Beam. Leverage, Moments, Elasticity, Stress and Strain.

ENGINEERING MATHEMATICS.**STAGE I.**

Lecturer :
R. V. WALKER.

Wednesday, 7.30 to 8.30.

Fractions and Decimals, Averages, Percentages, Ration, Unitary Method, and Square Root. British and Metric Systems of measurement.

Evaluation of Formulæ, Algebraical Manipulation, Simple Equations of one and of two unknowns, Problems and practical applications.

GEOMETRY.—Use of Compasses, Protractor, Vernier, etc. Mensuration of simple plane Areas. Use of squared paper. Plotting of Statistics. Simple Linear Law. Problems and Practical Applications.

MECHANICS.—Composition and Resolution of Forces. Resultants. Equilibrium. Graphical representation of Forces or Stresses. Triangle and Polygon of Force.

TRIGONOMETRY.—Measurement of Angles in degrees and radians. Definitions of their values by drawing to scale. Use of Tables of Sines, Cosines, and Tangents. Solution of right-angled triangles by calculation. Comparison with results got by actual measurement and drawing to scale.

STAGE 2.

Lecturer :
R. V. WALKER.

Wednesday, 8.35 to 9.35.

Indices, Logarithms; use of tables; application to Mechanical and Electrical Formulæ. Explanation of Slide Rule.

Determination of Areas and Volumes. Calculation of Weights from Volume and Density. Determination of the area of an irregular plane figure (1) by Planimeter, (2) by Simpson's Rule, or (3) by Squared Paper.

The Straight Line.—Elementary applications of the Linear Law; Slope of a Line; Slope of a Curve. Rate of Increase. Graphical and

Numerical illustrations. Meaning of Slope. Plotting on Squared Paper to determine roots of Equations. Determination of Maximum and Minimum values. The plotting of functions such as $y = ax^n$, and determination of rate of increase by approximate calculation and by drawing, leading up to the idea of a *Differential co-efficient*.

Proof and use of the rules for Differentiation. Integration regarded as Summation. Practical examples.

TRIGONOMETRY.—Functions of an Angle. Relations between the functions of an Angle. Curve of Sines. Use of Tables of Sines, Cosines, and Tangents, and other tables. Solution of Triangles.

Elasticity. Stress and Strain.

Mechanics : Moments and Couples. The Mechanics of the Beam under Stress. Graphical representation of Stresse in framed structures. Practical examples.

PRACTICAL MATHEMATICS.

STAGE 1.

Lecturer :

R. V. WALKER.

Monday, 7.30 to 9.35.

ARITHMETIC.—Contracted multiplication and division of decimals, square and cube root, ratio, and variation.

GEOMETRY AND MENSURATION.—Geometry of the line and circle, geometrical proportion, areas of plane figures, approximations to areas, Simpson's rules, volumes and surfaces of cone, cylinder and sphere.

ALGEBRA AND GRAPHS.—Fractions and partial fractions, simple and simultaneous equations, problems, simple quadratics, indices, logarithms, use of tables, calculations by logarithms, conversion of

Common to Napierian logs and *vice versa*. Plotting equations, the line, determination of mean lines, analysis of quadratic functions, solution and determination of max. and min. values, plotting exponential and trigonometric functions, meaning of "rate of increase" and "slope of curve."

The slide rule.

TRIGONOMETRY.—Radian measurement, the functions of an angle less than 90° , simple formulæ, reading the tables, solution of right-angled triangles. Relation between the sides and the functions of the angles of any triangle.

GENERAL.—Mass, force, weight, velocity and acceleration, simple vectors and vector laws, centre of gravity, Guldin's theorems, specific gravity.

STAGE 2.

Friday, 7.30 to 9.35.

ARITHMETIC.—The more advanced parts of Stage 1, and developments.

ALGEBRA AND GRAPHS.—Formulæ, quadratic equations and problems solvable by them, the theory of indices and surd quantities, use of the Binomial Theorem, especially in approximations, solution of quadratics and cubics graphically, maxima and minima, rate of increase, slope of curve, plotting logarithmic curves, approximate formulæ.

Simple differentiation, with application to maxima and minima.

GEOMETRY.—Theory of proportion, projection, trace of a line, trace of a plane, mensuration of solids, Simpson's rules, Guldin's theorems. Solid analytical geometry.

TRIGONOMETRY.—Functions of a simple angle, solution of right-angled triangles, heights and distances.

GENERAL.—Force, mass, weight, velocity and acceleration, momentum and energy, centre of gravity. Vector algebra.

STAGE 3.**Tuesday, 7.30 to 9.35.**

ALGEBRA AND GRAPHS.—Use of Binomial Theorem in approximations, harder logarithmic and exponential formulæ, solution of quadratics and cubics, imaginary quantities, plotting exponential functions, maxima and minima. Harmonic curves.

GEOMETRY.—Co-ordinates of a point in three dimensions, direction cosines, traces of a plane, the angle between two lines or planes, areas and volumes of surfaces of revolution, segments and sectors of circles, centres of gravity and moments of inertia.

TRIGONOMETRY.—Sums and differences, relations between sides and angles of a triangle, areas of triangles, limits of triangles.

DIFFERENTIAL AND INTEGRAL CALCULUS.—Rate of increase, simple differentiation, explicit and implicit functions, maxima and minima, integration, simpler formulæ, finding areas and length of curves, harmonic motion, Fourier's series, simple differential equations. Vectors and vector Algebra developed.

PURE MATHEMATICS.**STAGE 1.**

Lecturer :

M. A. HARTNETT.**Friday, 7.30 to 9.35.**

ARITHMETIC.—Principles of arithmetical operations, and their application to simple questions. The fundamental rules applied to whole numbers and to vulgar and decimal fractions.

PROPORTION.—Extraction of the square root of numerical quantities—Arithmetic as applied to ordinary questions of commerce and trade, including such questions as arise out of Bills, Interest, Percentages, Purchase and Sale of Stocks and Shares—Division of

profit and loss—Estimates—Weights and measures—The Metrical system.

GEOMETRY.—The properties of lines, triangles, and rectilinear figures, so far as they are treated in the 1st Book of Euclid.

ALGEBRA.—Definitions and explanations of algebraical signs and terms—Numerical substitutions—Integral indices—Addition, subtraction, multiplication, and division of algebraical expressions and fractions—Factors, greatest common measure and least common multiple—Reduction of fractional expressions—Simple equations and problems producing them.

TRIGONOMETRY.—Elementary ideas. Simple functions of an angle.

STAGE 2.

Monday, 7.30 to 9.35.

GEOMETRY.—Properties of rectangles, circles, and polygons, as they are treated in the 2nd, 3rd, and 4th Books of Euclid.

ALGEBRA.—Involution and evolution—Surds—Quadratic equations, and problems producing them—Ratio, proportion, and variation.

PLANE TRIGONOMETRY.—Definitions—Measurement of angles by degrees and radians—The trigonometrical functions, and the conversion of one into another. Their relations. The trigonometrical ratios of the sum and difference of angles, and of the multiples and sub-multiples of an angle. Curve of sines.

LOGARITHMS.—Definition—Multiplication, Division, Involution and Evolution by logarithms—The use of tables of logarithms of numbers, and of sines, cosines, etc., of angles—Tables of proportional parts for numbers and angles.

TRIANGLES.—Solution of all cases of right-angled and oblique triangles, and proofs of the requisite formulæ—Heights and distances—Areas of triangles.

STAGE 3.

Lecturer :

P. A. E. DOWLING.**Monday, 7.30 to 9.35.****Friday, 7.30 to 8.30.**

GEOMETRY.—Ratio and proportion with applications to Geometry, so far as the subject is treated in the definitions of Euclid's 5th Book, and in his 6th Book.

ALGEBRA.—Permutations and Combinations—Progressions—Complete theory of indices—The Binomial theorem.

PLANE TRIGONOMETRY.—Formulae for finding the sine, cosine, etc., of the sum and difference of two angles, and of the multiples and sub-multiples of an angle—Diameters of circles inscribed in and circumscribed about a given triangle—Areas of regular polygons inscribed in and circumscribed about a given circle—Area of a circle—Description and use of the vernier, theodolite, and sextant.

GRAPHICS.—The plotting of observations on squared paper—interpolation—errors of observation—average value, etc.—the plotting of functions—maximum and minimum values—Calculations and determinations by graphical methods.

STAGE 4.

Lecturer :

A. DONNELLY.**Wednesday, 7.30 to 9.35.**

Students taking Stages 4 and 5 should also attend the Class in Practical Geometry.

SOLID GEOMETRY.—Properties of straight lines and planes ; their intersections, inclinations, parallelism, perpendicularity ; properties of the sphere, and of cylinders and cones.

SPHERICAL TRIGONOMETRY.—Definitions, great and small circles, angles and sides of spherical triangles. Relation between the angles and sides of supplemental triangles. The fundamental relations between the trigonometrical ratios of the sides and angles of spherical triangles.

GEOMETRICAL CONICS.—Properties of the parabola, ellipse, and hyperbola deduced by pure geometry from definition *in plano*.

ALGEBRA.—The theory of indices. Simple cases of the summation of series. The simpler tests of the convergence and divergence of series. The binomial, exponential, and logarithmic series. Partial fractions. Elementary determinants. Imaginary and complex quantities. De Moivre's Theorem.

CO-ORDINATE GEOMETRY OF TWO DIMENSIONS.—Co-ordinates of a point; rectangular, oblique, and polar; transformation of co-ordinates.

Equations of straight lines, and the treatment of questions relative to their intersection, concurrence, inclination, parallelism, perpendicularity, etc.

Equations of circles, their tangents and normals.

The simpler forms of the equations of the parabola, ellipse, and hyperbola, as determined from various definitions of those curves.

STAGE 5.

Lecturer :
P. A. E. DOWLING.

Wednesday, 7.30 to 9.35.

Friday, 8.35 to 9.35.

CO-ORDINATE GEOMETRY.—Equations of straight lines. Problems thereon. Equations of circles, with problems.

Properties of poles and polars. Questions concerning the intersection of circles, and the determination of circles satisfying given conditions.

Forms of the equations of the parabola, ellipse, and hyperbola; the equations of their tangents and normals; properties of their diameters, axes, foci, conjugate diameters, asymptotes, poles and polars.

Discussion of the general equation of the second degree.

DIFFERENTIAL CALCULUS.—Definitions, limits, differential coefficients. Differentiation of simple functions, of inverse functions. Successive differentiation of functions of one variable. Taylor's and Maclaurin's Theorems and their simpler applications. Determination of values of functions when intermediate in form. Differentiation of a function and of implicit functions. Maxima and minima of functions of one independent variable. Differentiation of functions of two or more independent variables.

Applications of the preceding to the geometry of the plane curves referred to rectangular or to polar co-ordinates. Tangents, normals, sub-tangents, sub-normals, asymptotes. Singular points. Contact and curvature. Tracing of curves. Differential co-efficients of arcs and areas of plane curves, and of the surfaces and volumes of solids of revolution.

INTEGRAL CALCULUS.—Meaning of definite and of indefinite integrals. Integration of the more frequently occurring functions. Integration by parts. Rational functions. Formulæ of reduction.

Applications to areas and lengths of curves, to volumes and areas of surfaces of revolution, to centres of gravity, and moments of inertia.

ELEMENTARY DIFFERENTIAL EQUATIONS.—Integration of differential equations of the second and higher orders with constant coefficients.

MATHEMATICAL PHYSICS.

THEORETICAL MECHANICS.

SOLIDS AND FLUIDS—STAGE 1.

Lecturer :

M. A. HARTNETT.

Monday, 7.30 to 9.35.

The principles of Mechanics, Hydrostatics, and Pneumatics.

Units of length, mass, and time ; velocity, acceleration uniform and variable ; gravity ; laws of motion, momentum, inertia ; units of force—poundal, dyne ; mass and weight ; Attwood's machine ;

work, energy, power, horse-power ; parallelogram of forces, and forces in equilibrium ; parallel forces and centre of a system ; couples ; moment of a force ; centre of gravity, its position in symmetrical bodies ; machines and mechanical advantage ; levers, balance, pulleys ; the inclined plane ; elasticity ; uniform motion in a circle ; pendulum ; laws of friction.

Fluid pressure on surfaces in fluids ; Bramah press ; water level ; equilibrium of fluids which do not mix ; centre of pressure ; floating bodies, meta-centre ; specific gravity of bodies, and the methods by which it is determined ; the atmosphere, barometers, syphon, water pumps ; Boyle's law, and applications, pressure gauges.

This Class is suitable for Candidates preparing for the Matriculation Examination of the National University of Ireland, and for Trinity College, Dublin ; also for the Preliminary Examination of the College of Surgeons.

THEORETICAL MECHANICS.

SOLIDS AND FLUIDS—STAGE 2.

Lecturer :

M. A. HARTNETT.

Wednesday, 7.30 to 9.35.

Mechanics and Hydrostatics treated by Mathematical methods, not involving the Integral Calculus.

The theory of the composition and resolution of uniplanar forces ; centre of gravity of bodies ; statics of simple mechanisms, including pulleys, screws, inclined plane, etc. Friction, the simpler linkages, Hook's law, Young's modulus, the bending moment of a beam ; velocities and accelerations, including their resolutions and composition. Mass, momentum, force, energy and power. Motion under the action of a force which is constant in direction and magnitude. Projectiles, circular motion, simple harmonic motion. The simple pendulum. Simple cases of direct and oblique impact.

Determination of specific gravity; fluid pressure, centres of pressure, buoyancy and metacentre; equilibrium and stability of floating bodies; machines depending on fluid pressure; atmospheric pressure, Boyle's law, Charles' law; air pumps, water pumps, and syphons; simple cases of surface tension, efflux and rotation of liquids.

This Class is suitable for Second Arts candidates for the first Professional Engineering Examination of the National University, and for Theoretical Mechanics of the Board of Education.

MATHEMATICAL PHYSICS.

ELEMENTARY.

Lecturer:

A. T. DONNELLY,

Tuesday, 7.30 to 9.35, at Kevin Street.

STATICS.—Forces. Centre of gravity and graphical methods. Applications.

DYNAMICS.—Laws of motion. Simple harmonic motion.

FLUIDS.—Pressure. Floating bodies. Rotating liquid.

* **GASES.**—Pressure: properties and problems.

ADVANCED.

Lecturer:

A. T. DONNELLY.

Thursday, 7.30 to 9.35, at Kevin Street.

STATICS.—General theory of forces. Attraction, &c.

DYNAMICS.—Elements of dynamics of a particle.

HYDROSTATICS, GEOMETRICAL OPTICS, and ASTRONOMY.

This Course is suitable for Candidates preparing for the B.A. Examination in the National University of Ireland; and for the Second Professional Engineering Examination of the National University of Ireland.

Physics.

HEAD OF DEPARTMENT— W. J. LYONS.

LECTURERS AND DEMONSTRATORS—C. I. SANSOM,
E. MOYNIHAN,
J. ENRIGHT.

PHYSICS, JUNIOR—Lecture.

Laboratory.

PHYSICS, INTERMEDIATE—Lecture.

Laboratory.

PHYSICS, SENIOR—Lecture.

Laboratory.

ELECTRICITY AND MAGNETISM, JUNIOR—Lecture.

Laboratory.

ELECTRICITY AND MAGNETISM, INTERMEDIATE—Lecture.

Laboratory

ELECTRICITY AND MAGNETISM, SENIOR—Lecture.

Laboratory.

PHYSICS.

AT KEVIN STREET.

JUNIOR—Lecture.

Monday, Junior A—7.30 to 8.30.

Tuesday, Junior B—7.30 to 8.30.

Measurement of length, area, volume.

Motion. Mass. Force. Newton's Laws.

Measurement of force. Gravitation.

Principles of statics—Moments.

Principles of dynamics—Rotation, elementary ideas on moments of inertia.

Elasticity and strength of materials—stretching, bending, twisting

Simple periodic motion—vibration.

Principles of fluid pressure—applications.

Principle of Archimedes—applications, density determinations, flotation.

Atmospheric pressure—Boyle's Law.

Thermometry—Measurement of high and low temperatures.

Expansion of solids, liquids, gases.

Measurement of heat quantities—specific heats.

Fusion—melting points, effect on ; latent heat.

Vaporisation—boiling points, effect on ; latent heat.

Vapour pressure—study of steam, hygrometry.

Mechanical theory of heat—convection, conduction, radiation.

Propagation of light—elementary theory, photometry.

Formation of Images—by reflection from plane and spherical mirrors.

Refraction—prisms, lenses, dispersion.

Optical systems—lenses and combinations, telescope and microscope.

Spectrum analysis and theory of colours.

Wave-motion. Velocity of sound.

Vibration of strings.

Resonance—vibration of air columns and rods.

JUNIOR—Laboratory.**AT KEVIN STREET.****Monday, Junior A —8.35 to 10.5.****Tuesday, Junior B—8.35 to 10.5.**

Measurement of length, area, volume.

Use of micrometer screw, Vernier callipers, spherometers, &c.

Determination of densities—bore of tube, &c.

Extension of springs—stretching of wires, bending.

Experiments with pendulums.

Parallelogram of forces—principle of Lever.

Atmospheric pressure—Boyle's Law, pressure of gas and water in mains.

Determination of co-efficient of thermal expansion.

Thermometers—comparison, standardisation.

Determination of freezing points and boiling points.

Specific and latent heat determinations.

Hygrometry.

Photometry.

Constants of lenses and mirrors.

Indices of refraction.

Magnifying powers.

Spectrometry.

Vibration of strings.

Velocity of sound—resonance.

INTERMEDIATE—Lecture.**AT KEVIN STREET.****Thursday, Lecture, 7.30 to 8.30.**

Principles of dynamics and statics.

Elasticity—Young's Modulus, bending, bending moments.

Elasticity (continued)—Rigidity, elasticity, limits and properties of materials.

Simple periodic motion, wave-motion.

Fluid pressure—principle of Archimedes, applications.

Atmospheric pressure—Boyle's Law.

Thermometry.

Co-efficient of expansion—solids, liquids, gases.

Calorimetry.

Fusion—effects on freezing points, latent heat.

Vaporisation—effects on boiling point, latent heat.

Vapour pressure—liquefaction of gases.

Laws of gases—isothermal, adiabatic.

Mechanical theory of heat—Thermo-dynamics.

Convection—applications of.

Conduction of heat.

Radiation—principles of, laws.

Propagation and velocity of sound.

Modern theory of light—reflection and refraction.

Spherical mirrors—spherical aberration.

Dispersion—prisms and lenses.

Optical systems—telescopes, microscopes.

Spectroscopy.

Interference.

Diffraction.

Polarisation.

INTERMEDIATE—Laboratory.

AT KEVIN STREET.

Thursday—Laboratory, 8.35 to 10.5.

Special determinations of densities.

Accurate determination of small dimensions.

Extension and vibration of springs.

Moments of inertia.

Moduli of elasticity—Young's Modulus by bending.

Simple and compound pendulums.

Use of standard barometer—Boyle's law.

Correction of thermometer.

Coefficients of liquids and gases—apparent and real.

Determination of specific heats.

Determination of melting and boiling points of solvents and solutions.

Determination of latent heats.

Vapour pressure curves and cooling curves.

Determination of vapour densities.

Mechanical equivalent of heat and ratio of specific heats.

Optical constants of spherical mirrors and lenses.

Determination of indices of refraction.

Magnifying powers of microscopes and telescopes.

Use of the spectrometer.

Use of the grating to find wave-lengths.

Polarimetry.

Exact photometry.

SENIOR.

AT KEVIN STREET.

Thursday, 7.30 to 10.5.

This Course will consist for the most part of advanced laboratory work, from 7.30 to 10.0 p.m., with frequent occasional lectures on special subjects. Each student will do a special course of experiments assigned to him in accordance with his capabilities and his own requirements.

The following branches of Physics will receive special attention :—

Elasticity and properties of materials (solids).

Viscosity and capillarity.

Osmosis.

Thermometry—high and low temperature measurements.

Calorimetry—methods of precision.

Thermal conductivities.

Vapour pressure and vapour density.

Mechanical equivalent of heat—thermodynamics.

Study of lenses and systems of lenses.

Spectrometry.

Interference of light—bi-prisms, &c.

Diffraction—transmission and reflection gratings.

Polarisation—Polarimetry.

WIRELESS TELEGRAPHY.

If sufficient Students apply, a Course of twelve lectures in Wireless Telegraphy will be given by Mr. W. L. Lyons, at Bolton Street, on Tuesdays, 8.35 to 9.35, commencing November 5th. Fee, 2s. 6d. for the twelve lectures.

ELECTRICITY AND MAGNETISM.

JUNIOR—Lecture.

AT BOLTON STREET,

Tuesday, Junior A—7.30 to 8.30.

Friday, Junior B—7.30 to 8.30.

MAGNETISM.—Permanent magnets, magnetic metals. Methods of magnetising. Distribution of magnetism in a magnet, magnet poles, consequent poles, magnetic moment. The Magnetic Field. Magnetic induction. The Magnetism of the Earth.

ELECTRICITY.—Fundamental facts of statical electricity.

The production of electric currents. The simple cell. Various types of primary cells. Leclanché, Bichromate, and Daniell. The magnetic effects of the current. Electro-magnets and their applications. Galvanometers. Conductors and Insulators. Ohm's Law. Resistance, and the factors on which it depends. Potential, Resistance, and Current strength, with the law connecting them. Practical electrical Units. The Volt, Ampere, Ohm, and Watt. The B.O.T. unit. Divided circuits and the grouping of cells. Ammeters and Voltmeters. Drop of potential and factors governing the size of cables. The thermal effects of the current, and methods of measurement. The relation between the heat produced and the current strength, resistance and time. Fuses. Incandescent lamps. The electric arc. Photometry. The chemical effects of the current. Faraday's Laws. Electro-deposition. Secondary Cells.

JUNIOR—Laboratory.**AT BOLTON STREET.****Tuesday, Junior A—8.35 to 10.5.****Friday, Junior B—8.35 to 10.5.**

Manufacture of magnets and testing of polarity and position of poles ; distribution of Magnetism in a bar magnet ; mapping fields of Force. Study of Induction in iron and steel.

Elementary treatment of magnetic moments and of intensities of magnetic fields by deflection methods ; vibration methods.

Voltaic cells and polarisation. Magnetic effects of Currents. Magnetic Fields in Solenoids.

Principles of Galvanometers.

Ohm's Law---Cells in series, and in parallel.

Resistances in series and in parallel.

Wheatstone bridge.

Variation of resistance with temperature.

Use of Potentiometer.

Shunt circuits.

Determination of internal resistance of cells.

Electrolysis. Use of copper Voltmeter. Heating effect of a Current.

Types of Ammeters and Voltmeters.

Experiments of Electromagnetic Induction.

Comparison of E.M.F's. by various methods.

Simple Calibration of Instruments.

Measurements of Voltage, Current, Resistance, Watts, and Candle-power of an electric lamp.

Electric Bells, etc.

INTERMEDIATE—Lecture.**AT KEVIN STREET.****Wednesday, Intermediate 7.30 to 8.30.**

MAGNETISM.—Resumé of elementary facts—Polarity—Theories of Magnetism—Magnetic Induction—Magnetic permeability—Magnetic properties of iron and steel—Laws of magnetic force—Hysteresis—Magnetic Moments—Magnetometers—Terrestrial Magnetism—Declination—Inclination — Magnetic charts — Magnetic measurements.

ELECTROSTATICS.—Resumé of elementary facts—Theories of electrification—Potential—Induction — Distribution — Capacity — Action of di-electrics—Condensers—Electrical machines—Electrometers—Atmospheric Electricity.

CURRENT ELECTRICITY.—Effects of an electric Current—Conditions necessary for the production of a Current—Methods of setting up a Potential difference—Theory and construction of primary batteries—Magnetic effects and measurement of current—Galvanometers—Ohm's law—Resistance—Transformers—Standard Galvanometers and Resistances—Wheatstone bridge—Post Office bridge—Thermal effects of a current—Joule's law—Applications of heating effects—Chemical effects—Electrolysis—Applications of Chemical effects—Laws of Electro-Magnetism—the Magnetic circuit—Electro-dynamics—Electro-magnetic induction—Induction coils—Alternating Currents—Electric oscillations and Waves—Thermo-electricity—Conduction through gases—Radio-activity.

INTERMEDIATE—Laboratory.**AT KEVIN STREET.****Wednesday, Intermediate—8.35 to 10.5.**

Distribution of Magnetism in a bar magnet; mapping fields of Force.

Comparison of magnetic moments and of intensities of magnetic fields by deflection methods; vibration methods.

Determination of H.—horizontal component of Earth's field; determination of the magnetic moment of a magnet.

Electrical machines. Electrostatics.

Principles of Galvanometers.

Wheatstone's bridge. Post Office Box.

Variation of resistance with temperature.

Use of Potentiometer.

Determination of internal resistance of cells.

Use of copper and gas Voltmeters. Heating effect of a current—Joule's law.

Resistance of Electrolytes. Thermo-electricity. Use of ballistic galvanometer.

Use of earth Inductor to find H.—and "angle of dip."

Testing intensity of magnetic fields and distribution of Magnetism with a small coil; distribution in a solenoid.

Hysteresis and Magnetic Curves.

Comparison of capacities of two Condensers; comparison of E.M.F.'s by means of Condenser.

Self and Mutual Induction.

Calibration of Instruments.

Photometry. Resistance of lamps, hot and cold. Efficiency.

SENIOR.

AT KEVIN STREET.

Friday, Senior—7.30 to 10.5.

This course will consist chiefly of advanced laboratory work with frequent lectures. The following subjects will be specially considered.

Magnetisation of iron and other metals—Hysteresis Curves.

Electrolytic conductivities—Ionic velocities.

Methods of precise measurements of high and low Resistances.

Absolute electric measurements and standardisation of instruments.

Measurements by Ballistic Galvanometer.

Coefficients of Self and Mutual Induction.

Comparison and absolute determination of Capacities.

Thermo-electricity—high temperature measurement.

Ionisation and Radio-activity.

Electric waves—Wireless Telegraphy systems.

Technical Photometry.

Chemistry, Materia Medica, Botany, and Pharmacy.

HEAD OF DEPARTMENT—P. BERTRAM FOY, F.C.S.

CHEMISTRY—INORGANIC, THEORETICAL.

CHEMISTRY—INORGANIC, PRACTICAL.

CHEMISTRY—APPLIED.

CHEMISTRY—ORGANIC, THEORETICAL.

CHEMISTRY—ORGANIC, PRACTICAL.

CHEMISTRY—PRACTICAL FOR PHARMACEUTICAL STUDENTS.

CHEMISTRY—PRACTICAL FOR MEDICAL STUDENTS.

MATERIA MEDICA.

BOTANY.

PHARMACY.

Applied Chemistry.

INORGANIC CHEMISTRY, THEORETICAL.

Lecturer :

M. J. O'CONNOR.

ELEMENTARY.

Wednesday, 7.30 to 8.30.

Historical and introductory.

Nature of Elements, Mixtures, and Compounds.

Decomposition of Water and of Steam ; Hydrogen.

Displacement of Hydrogen from Acids ; properties of this gas.

Preparation of Oxygen, Combustions ; products ; classification.

Oxygen : Density ; Gas Laws of Boyle and Charles.

Combustion : Phlogiston Theory, Modern view. Flame.

Water : Composition by analysis and synthesis. Gay Lussac's Law of Gas Volumes.

Water : Physical properties ; solvent action.

Diffusion of Gases : Graham's Law. Avogardic's Hypothesis.

Dalton's Atomic Hypothesis. Atoms, Molecules, Symbols, Formulae, Equations.

The Atmosphere : Composition. Solubility of Gases in water. Air a mixture : proofs.

Equivalents : Valency and Atomic Weights. Nitrogen from Air, from Ammonium Nitrite.

Hydrogen Chloride : preparation and properties.

Hydrogen Chloride : Volume, Composition. Density, Formula. Chlorides.

Chlorine : Preparation and properties.

Nitric Acid : Preparation and properties.

Nitrates : Nitrogen Pentoxide. Nitrogen Peroxide.

Nitric Oxide : Preparation, properties, Volume, Composition ; Formula.

Nitrous Oxide : Preparation, properties, Volume Composition ; Formula. Law of Multiple proportions.

Ammonia: Preparation, properties, Volume Composition; Formulae.

Carbon: Allotropism. Carbon Dioxide. Modes of preparation, properties, Volume Composition; Formula.

Carbonates: Reduction of Carbon Dioxide. Preparation and properties of Carbon Monoxide.

Sulphur: Preparation of Sulphur Dioxide; properties, Composition; Formula. Sulphites.

Sulphuric Acids: Epitome of preparation, properties, Sulphates.

Hydrogen Sulphide: Preparation, properties, Composition, Formula. Analogy of Sulphur and Oxygen.

SUPPLEMENTARY CLASS FOR MEDICAL AND PHARMACEUTICAL STUDENTS.

Lecturer:

M. J. O'CONNOR.

Thursday, 7.30 to 8.30.

Introductory.

Classification of Elements. Metals. Metalloids. Non-Metal. Crystallisation of Metals.

Combustion of Hydrogen. Oxyhydrogen Flame; production and use.

Oxidising Agents. Respiration of Oxygen. Physiological Effect.

Synthesis of Common Oxyacids from their Anhydrides. Nature of Acids.

Influence of Temperature and Pressure on Gaseous Volumes. Connection to N. T. P. Examples.

Ozone. Allotropism. Hydrogen Peroxide, Bleaching action of.

Further Study of Combustion. Sources of Energy in Animal and Vegetable life.

Water. Gravimetric Composition; purification; detection of impurities.

Influence of Diffusion on the Atmosphere. Liquid Diffusion.

Experimental basis of Formulae and Equations. Chemical Arithmetic.

Periodic Classification of Elements. The Halogen Group.

Nitrogen Group. Phosphorus and its more important Compounds.

Arsenic, Antimony, Bismuth: their chief Compounds. Alloys.

Sodium: Its chief Compounds.

The more important compounds of the following metals: Potassium, Ammonium, Amalgams.

Calcium, Strontium, Barium, Magnesium, Zinc.

Lead, Silver, Gold.

Mercury, Copper, Iron. Specific and Atomic Heats.

Carbon Compounds: General view as to their constitution.

Alcohols: Ethyl alcohol as a type.

Some of the more important organic acids.

Ether Chloroform and Ethyl acetate.

Starch and the chief sugars.

N.B.—After the present Session, the Pharmaceutical Society will require Candidates to have attended Lectures in Chemistry before making the qualifying attendances in the Laboratory.

INORGANIC CHEMISTRY, THEORETICAL.

ADVANCED.

Lecturer:

P. BERTRAM FOY.

Monday, 7.30 to 8.30.

Molecular constitution. Theory of Avogadro. Law of Gay Lussac.

More detailed study of water. Boiling and freezing points and effect of bodies in solution on.

The gas laws applied to dilute solutions. Methods of determining molecular weights.

Oxides of carbon—their properties and constitution; modes of preparation.

Carbonates, their properties and estimation.

Influence of animal and plant life on air. Ventilation.

Nature of flame—ordinary hydro-carbons and products of combustion.

Sulphur and its more important oxides.

Sulphurous and Sulphuric Acids: their preparation and estimation.

Basicity of Acids. Constitution of Sulphuric Acid. Nitrates and nitrites. Calcium Nitrate and nitrification.

Sulphates. Study of their properties and applications. Thio-sulphate and its use.

Phosphorus. Uses, preparation and properties.

Oxides, chlorides, hydrides and more important acids of phosphorus. Calcium phosphate as fertiliser.

Boron, Boron trioxide, Boric acid, Boron fluoride and Borax.

Silicon. Silicon tetrafluoride. Silicates. Glass.

Arsenic, its detection and properties. Acids of Arsenic.

The Hydrogen group, periodic classification.

Antimony and Bismuth. Alloys, their properties, amalgams, &c.

More detailed study of halogen elements. Bleaching Lime and Potassium Chlorate.

Fluorine and Hydrogen fluoride.

Electrolysis and electrolytic dissociation

Chemical dissociation; examples, &c.

INORGANIC CHEMISTRY, THEORETICAL.

Third Year.

Lecturer :
J. J. HUTCHINSON.**Thursday, 7.30 to 8.30.**

Vapour density and methods of finding it.

Specific Heat, relation to atomic and molecular weights.

Metals, their classification and general properties.

General methods of extracting metals from their ores.

Metals of Sodium group.

Manufacture of sodium carbonate and hydrate.

Potassium and its more important compounds.

The Alkaline earths.

The iron group. Metallurgy of iron. Steel, composition and varieties of.

Aluminium ; occurrence, extraction and properties ; the alums.

Zinc and mercury, alloys and amalgams.

Tin, lead, and silver ; their more important salts.

Copper and its compounds.

Outlines of spectrum analysis.

Electrolysis. Electrolytic methods of estimating metals.

Thermo Chemistry. Heat of combustion, thermal value of fuels.

Mass action, reversible chemical changes.

Double decomposition and laws relating to it.

ORGANIC CHEMISTRY.**ELEMENTARY.****Thursday, 7.30 to 8.30.**

These Lectures commence in the Spring when the preceding ones come to an end, forming part of the same Course, and included in the same fee.

Carbon-Valency. Typical carbon compounds.

Hydro-carbons saturated and non-saturated.

Alcohols—their constitution and properties.

Oxidation products of alcohols.

Percentage composition, empirical formulae and molecular weights.

Constitutional formulae, its value and determination in a few typical cases. Isomerism.

ORGANIC CHEMISTRY, THEORETICAL.**ADVANCED.**

Lecturer :

J. J. HUTCHINSON.**Friday, 7.30 to 8.30.**

Characteristics of Carbon Compounds. Qualitative and quantitative determination of Nitrogen. The Halogens, Sulphur and Phosphorus in Carbon Compounds.

The Paraffin series of Hydrocarbons, Homology and Isomerism.

The Olefine Series. The Acetylene Series. Saturated and unsaturated compounds.

The commercial Hydrocarbons. Paraffin, Petroleum, their occurrence and application.

Alcohols. Methyl Alcohol. Ethyl Alcohol. Industrial preparation. Fermentation. Alcoholometry. Constitution of the Alcohols. The higher Alcohols. Fusil Oil.

Aldehydes and Ketones. Preparation, Properties, Derivatives.

The Fatty Acids. Preparation and properties of Formic Acid. Manufacture of Acetic Acid. Vinegar. Constitution of the fatty acids. Acetic Anhydride and Chloride.

Palmitic Stearic and Oleic Acids. Nature of common Fats. Saponification. Soaps.

Ethers. Manufacture of Di Ethyl Ether. Ethereal salts or Esters. Ethyl acetate. Ethyl Sulphate. Hydrolysis of Esters.

Haloid derivative of Paraffins and Olefines. Chloroform. Iodoform. Ethylene Dichloride and Dibromide.

Amines. Preparation and properties of Ethylamine Amides. Acetamide.

Nitriles. Preparation and properties of Acetonitrile.

Polyhydric Alcohols. Glycol. Glycerol. Derivatives. Manufacture of Nitro Glycerine.

Hydroxy Acids. Glycollic and Lactic Acids.

Oxalic, Succinic, Malic and Tartaric Acids. Preparation, properties and synthesis.

Stereo-isomerism.

The Carbo-hydrates. The Sugars. Enzymes. Invert Sugar. Use of Fehling's solution and the Polarimeter.

Starch and the Dextrins. Microscopic examination. Cellulose and Gun Cotton.

Cyanogen compounds. Simple and complex cyanides. Manufacture and properties of Potassium Ferrocyanide. Prussian Blue.

Urea. Its preparation and synthesis. Estimation.

The Aromatic Series. Benzene, a typical closed chain compound.

The more important derivatives of Benzene.

The Phenols. Picric Acid. Aniline. Industrial applications.

The Coal Tar Dyes. A brief account of their discovery and preparation.

PRACTICAL CHEMISTRY.**FIRST YEAR.**

Demonstrators :

P. BERTRAM FOY.**M. J. O'CONNOR.****Tuesday, 7.30 to 10.5.**

Students in the Chemical Laboratories are required to provide themselves with gramme weights, with platinum wire and foil.

Manipulative exercises : Glass-working, Cork-boring, and fitting up Apparatus.

The action of heat, water, &c., on substances and mixtures of substances.

Examination and purification of tap-water. Study of solubility of a salt in water.

Preparation and properties of the more readily obtained substances, *e.g.*, Hydrogen, Oxygen, Chlorine, Hydrochloric acid, Nitric acid, Carbon dioxide, &c. Study of the gases evolved by the action of mineral acids on metals, and the general properties of the residues.

Measurement of volume of gases evolved during chemical reactions. Reduction of gaseous volumes to standard temperature and pressure.

Determination of the Density of Gases. The study of Chalk : various experimental investigations.

The properties of alkalis. Preparation and re-crystallisation of simple salts. Qualitative and Quantitative study of the action of acids on alkalis. The use of Indicators. The determination of the equivalent of an element by simple methods.

Qualitative recognition of Chlorides, Sulphates, Sulphites, Carbonates, Nitrates, and Nitrites.

Examination and purification of tap-water.

Determination of volume of Hydrogen disengaged by unit mass of different Metals—results to be utilised for the calculation of their Equivalents at a later stage.

Examination of the mass and volume of Oxygen from 1 gramme of Potassium Chlorate : comparison of properties of original and residual substances. Density of Oxygen.

Percentage volume of Oxygen in the atmosphere by different methods.

Some fundamental experiments on the rusting of iron.

Displacement of Silver and Copper from solutions of their salts by Magnesium and Zinc respectively. Quantitative measurement. Reduction of metallic Oxides by Hydrogen.

Neutralisation of acids and alkalies : determination of mass of salt formed from a fixed mass of base.

Percentage of water of crystallisation in Soda crystals by Volumetric method.

Preparation and estimation of metallic oxides from fixed mass of metal, using Nitric Acid.

Action of heat and of acids on Carbonates.

PRACTICAL CHEMISTRY.

SECOND YEAR.

Demonstrators :

Monday 8.35 to 10.5.

Tuesday, 7.30 to 10.5.

Wednesday, 7.30 to 10.5.

P. B. FOY.

J. J. HUTCHINSON.

B. G. FAGAN.

Students will be allowed to work on two nights at their option.

General scheme for the classification of metals into groups.

The detection and separation of the following metals :—

Silver, Lead, Mercury, Copper, Bismuth, Cadmium, Arsenic, Antimony, Tin, Iron, Aluminium, Chromium, Zinc, Nickel Cobalt, Manganese, Calcium, Barium, Strontium, Magnesium, Sodium, Potassium and Ammonium.

The classification of acids into groups. The detection and separation of the following acid radicals:—

Sulphates, Carbonates, Sulphites, Fluorides, Borates, Silicates, Phosphates, Chlorides, Bromides, Iodides, Thiosulphates, Sulphides, Hypochlorites, Arsenates, Arsenites, Nitrites, Chlorates and Nitrates.

Principles of Volumetric Analysis. Preparation and use of standard solutions, acids and alkalies. Silver Nitrate, Iodine and Sodium Thio-sulphate.

Exercises in the preparation of substances in a state of purity.

PRACTICAL CHEMISTRY.

THIRD YEAR.

Demonstrator:

J. J. HUTCHINSON.

M. J. O'CONNOR.

Thursday, 8.35 to 10.5.

Friday, 7.30 to 10.5.

INORGANIC.—A more extended use of standard solutions. The use of standard Permanganate, Bichromate and Thio-cyanate solutions.

The ordinary methods of Gravimetric Analysis, including the estimation of Silver, Lead, Copper, Tin, Arsenic, Antimony, Iron, Aluminium, Zinc, Nickel, Calcium, Barium, Magnesium, Sodium, and Potassium, Hydrochloric, Sulphuric and Carbonic acids.

The application of the above, and also of volumetric methods to the determination of the composition of simple alloys, and to simple problems.

Qualitative analysis of mixtures containing metals and acids.

ORGANIC.—Determination of melting and boiling points.

Study of Methyl and Ethyl Alcohols: Formic, Acetic, and Oxalic Acids.

Students who are working exclusively on Organic Analysis will be taken through a special Course of work.

PRACTICAL CHEMISTRY.**ADVANCED ORGANIC.**

Demonstrators :

J. J. HUTCHINSON.**M. J. O'CONNOR.****Thursday, 7.30 to 10.5.****Friday, 8.35 to 10.5.**

The detection of Carbon, Hydrogen, Nitrogen, Sulphur, and the Halogens in Carbon Compounds.

Fractional Distillation. Estimation of Alcohol in a spirituous liquid.

Preparation of some typical organic substances in a state of purity. Melting and boiling points as tests of purity.

Exercises in analytical work, general reactions by which substances may be placed in one or other of the groups : Alcohols, Aldehydes, Ketones, Acids, Esters, Amides, The Sugars, Cyanides. Recognition of the more important typical members of these classes.

Technical Analysis of Oils, Fats, Soaps, and Varnishes.

PRACTICAL CHEMISTRY.**PHARMACEUTICAL COURSE.**

Demonstrator :

M. J. O'CONNOR.**Monday, 7.30 to 10.5.****Wednesday, 8.35 to 10.5.**

Students working in the Laboratory, are supplied with apparatus and reagents, but are to provide themselves with gramme weights, also platinum wire and foil.

Students who attend for a minimum period of one hundred hours are given recognised Certificates of Attendance in connection with the Pharmaceutical Society, provided that they comply with the rules of the class, and pass the examination in Practical Chemistry held at the close of the Session. The qualifying attendance may be spread over two Sessions. In order to secure the Certificate, Students must attend the Lectures with fair regularity, and if they are taking the Pharmacy Course (Page 25) they must also attend well at Botany and Materia Medica or at Pharmacy. See Note, Page 25.

Manipulative Exercises.

Preparation of Salts from Metal and Acid.

Preparation of Salts from Metal Oxide or Hydroxide and Acid ;
from Metal Carbonate and Acid.

Reactions of the Common Acids.

Analytical Classification of Acid Radicals.

Detection of a single Acid Radical in a Solid or Liquid containing one of the following :—

Acetate, Arsenate, Arsenite, Borate, Bromide, Bicarbonate, Carbonate, Chlorate, Chloride, Chromate, Citrate, Cyanide, Formate, Fluoride, Hypochlorite, Iodide, Nitrate, Nitrite, Oxalate, Phosphate, Sulphate, Sulphide, Sulphite, Tartrate, Thiosulphate.

Analytical Classification of the Common Metals. Detection of two Metallic Radicals in a mixture from the following :—

Lithium, Potassium, Sodium, Ammonium, Magnesium, Barium, Strontium, Calcium, Zinc, Manganese, Nickel, Cobalt, Iron, Aluminium, Chromium, Arsenic, Antimony, Tin, Mercury, Lead, Bismuth, Copper, Cadmium, Silver.

Treatment of Insoluble Substances.

VOLUMETRIC ANALYSIS :—

Preparation of Standard Solutions.

Titration of Acids and Alkalies.

Estimation of Acids and Alkalies.

Precipitation Methods :—Use of Silver Nitrate. Estimation of Chlorides. Chlorine.

Oxidation and Reduction Methods.—Use of Potassium Permanganate. Estimation of Iron.

Use of Iodine and Sodium Thiosulphate. Estimation of Arsenic.

Detection of certain Alkaloids.

PRACTICAL CHEMISTRY.**MEDICAL COURSE.****Thursday, 8:35 to 10.5:****Friday, 8.35 to 10.5:**Demonstrator :
M. J. O'CONNOR:

Manipulative Exercises.—Preparation of Salts using a Metal and Acid.

Preparation of Salts using Metallic Oxide or Hydroxide and Acid ; using Metallic Carbonate and acid.

Study of the reactions of the Common Acids. Analytical classification of the Acid Radicals.

Detection of a single Acid in a powder containing one of the following :—

Acetate, Arsenate, Arsenite, Borate, Bromide, Carbonate, Chlorate, Chloride, Chromate, Citrate, Cyanide, Formate, Fluoride, Hypochlorite, Iodide, Nitrate, Nitrite, Oxalate, Phosphate, Sulphate, Sulphide, Sulphite, Tartrate, Thiosulphate.

Analytical classification of the Common Metals. Detection of two Metallic Radicals in a mixture from the following :

Lithium, Potassium, Sodium, Ammonium, Magnesium, Barium, Strontium, Calcium, Zinc, Manganese, Nickel, Cobalt, Iron, Aluminium, Chromium, Arsenic, Antimony, Tin, Mercury, Lead, Bismuth, Copper, Cadmium, Silver.

Identification of certain Sugars :—Cane, Glucose, Maltose, Lactose.

Identification of Urea, Uric Acid, Urates, and Examination of Urinary Constituents.

Identification of certain Alkaloids.

N.B.—Students other than those following the Medical Course omit the last three paragraphs and continue their analysis of insolubles, or begin volumetric work, at their option.

PHARMACY.

Lecturer :

Thursday, 7.30 to 9.35.

Lectures will be given in this Subject if sufficient students apply before Nov. 1.

MATERIA MEDICA.Lecturer :
J. ADAMS.**Friday, 8.35 to 9.35.**

Organs of plants from which drugs are derived, roots, leaves, barks, &c.

Definitions and examples of Oils, both Fixed and Volatile, Resins, Oleo-resins, Gums, Gum-resins, Balsams, and other substances.

Various explanations and definitions: Families, Genera, and Species of Plants; time of collection; characters used in identification; active principles of drugs such as alkaloids, glucosides, &c.; terms used to describe the action of drugs, Astringents, Carminatives, &c.

Detailed description of the drugs of vegetable origin, including name of drug, part of plant used, country whence obtained, name of species of plant and family to which it belongs, distinctive characters of drug, adulterations, active principles, and uses. Drugs derived from the whole plant.

Roots. Underground shoots, rhizomes, &c. Green shoots. Barks. Woods. Leaves. Flowers. Fruits, Seeds.

Fixed and volatile oils. Resins and oleo-resins. Gum-resins Gums, balsams.

Dried juices.—Aloes, Opium, &c.

Miscellaneous substances.—Starch, Galls, &c.

Drugs of animal origin.

BOTANY.

Lecturer :
J. ADAMS.

Friday, 7.30 to 8.30.

The plant cell: Protoplasm, Nucleus, Chloroplasts, Aleurone grains, Starch grains, Crystals.

Other cell-contents: Oil, Sugar, Inulin, Anthocyanin, Ferments. The cell-water, its structure and markings.

Various forms of cells; vessels, sieve-tubes.

The tissues of plants and their functions. Air-spaces.

Structure of Seeds. Germination of Seeds.

The Root; external characters, root hairs, root-cap, internal structure, functions, absorption of substances necessary for plant growth, root pressure, relation to gravity.

Various types of Shoot: runners, buds, rhizomes, tubers, corms, bulbs.

The Stem: external characters, internal structure, fibro-vascular bundles, growth in thickness, structure of woody stems, origin of bark, methods of branching, relation to light and gravity, functions.

The Leaf: various kinds of leaves, bracts, shape of the leaf, stipules, venation, method of unfolding, simple and compound leaves, minute structure, stomata, fall of leaf, functions, relation to light.

The chief types of Inflorescence.

The Flower: symmetry, arrangement and number of parts, aestivation, floral receptacle, calyx, corolla.

The Stamens: number, position, dehiscence of the anther, pollen grains, methods of pollination.

The Pistil: number of carpels, position, placentation.

Structure of the Ovule: fertilisation, development of the embryo.

The Fruit: fleshy, dry, indehiscent, dehiscent.

Methods of dispersal of fruits.

Miscellaneous structures: hairs, emergences, spines, tendrils, nectaries.

Relation of plants to their surroundings: parasitic, carnivorous, climbing, aquatic plants; herbs, shrubs, and trees; protection against animals.

Classification of plants: Gymnosperms, Coniferae Angiosperms, Monocotyledons, Liliaceae, Gramineae, Dicotyledons, Ranunculaceae, Cruciferae, Rosaceae, Leguminosae.

Umbelliferae, Labiatae, Solanaceae, Compositae.

Mechanical Engineering.

HEAD OF ENGINEERING DEPT.—JOHN TAYLOR, M.A.

HEAD OF DRAWING DEPT.—C. B. OUTON.

ENGINEERING.

TECHNICAL DRAWING.

MACHINE DRAWING.

PRACTICAL GEOMETRY.

APPLIED MECHANICS.

HEAT ENGINES.

ENGINE AND MACHINE DESIGN.

STRUCTURAL DESIGN.

SURVEYING.

AEROPLANE MODELLING.

ENGINEERING WORKSHOP INSTRUCTION :

Turners' Work.

Fitters' Work.

Smiths' Work.

Pattern Makers' Work.

Moulders' Work.

Mechanical Drawing.

TECHNICAL DRAWING.

Lecturer :

E. E. JOYNT.

Class A.—Monday, 7.30 to 9.35.

Class B.—Wednesday, 7.30 to 9.35.

This class forms an introduction to Machine Drawing, and will be found most useful to students of Mechanical and Electrical Engineering.

Use of instruments, compasses, tee squares, set squares and scales.

Simple geometrical figures, square, hexagon, etc. Bisection of lines and angles. Construction of regular polygons. Divisions and properties of the circle. Tangents to circles. Cycloidal and involute curves. The numbers 3·1416 and ·7854. The ellipse and its properties.

Simple drawings to scale of elementary machine details as below, particular attention being directed to the geometrical principles involved :—

Hexagon nuts. Bolts. Round and oval flanges. Screw threads, vee and square. Double threads. Setting out tapers. Gib and cotter, keys and keyways. Shaft couplings. Pedestals for shafting. Toothed gearing, spur and bevel.

Elementary engine details, such as—Overhung crank with pin. Crank shaft. Piston and rod. Crosshead. Gun-metal stopcock. Simple stop valve.

The above will be illustrated in every case by means of models, or by the actual details themselves.

Students joining this class will be required to come provided with pencil, compass, set squares, rule, india-rubber and class note-book.

MACHINE CONSTRUCTION AND DRAWING.Lecturer : **C. B. OUTON.**Demonstrator : **E. E. JOYNT.****STAGE 1.****Thursday—Lecture, 7.30 to 8.30.****Drawing, 8.35 to 9.35.**

FASTENINGS.—Bolts and nuts. Studs. Whitworth screw threads. Keys. Cotters. Pins. Rivets and rivetted joints.

BEARINGS.—Form of bearings. Provisions for adjustment, wear, and alignment. Swivel, thrust, footstep, crank shaft, and line shaft bearings.

Bearing supports, pedestals, hangers, brackets, wall boxes.

Bearing lubricators.

SHAFTING.—Different forms of shaft couplings.

WHEELS AND PULLEYS.—Belt and rope pulleys. Open and crossed belts. Belt-shifting gear. Countershafting. Cams and ratchets. Spur and bevel gearing. Proportions of wheels and wheel teeth.

ENGINES.—Cylinders. Pistons. Piston and Piston-rod connections. Stuffing boxes. Packing. Crossheads and slides. Connecting rods. Crank and crank shafts. Valves.

BOILERS.—Boiler shells. Gusset stays. Longitudinal and screwed stays. Boiler mountings.

PIPES.—Joints for steam, gas, and water pipes. Unions. Stop valves.

MACHINE TOOLS.—Simple details of Lathes, Drilling Machines, Shaping Machines.

Forms of tools and cutters.

STAGE 2.

Thursday—Lecture, 8.35 to 9.35.

Drawing, 7.30 to 8.30.

The student will be required to show proficiency in the subjects set out under the syllabus for Machine Drawing of the First Year. He should, however, have attained to a higher degree of finish in draughtsmanship, and be competent to deal with more intricate machine parts.

He should have a general knowledge of the machinery and materials, and a more exact knowledge of the commoner details used in machine construction.

In addition to the subjects listed in the syllabus for Machine Drawing (First Year), a knowledge of the following additional subjects will be expected:—

FASTENINGS.—Lock nuts. Rivetted joints.

BEARINGS.—Various kinds: Propeller; Shaft bearings; Locomotive axle boxes; Ball bearings; Roller bearings; Lubricators; Continuous lubrication—Ring lubricators.

SHAFTING.—Disengaging and friction clutches.

WHEELS AND PULLEYS.—Details of spur and bevel gearing. Worm gearing. Helical gearing. Chain gearing.

ENGINES.—Various forms of slide valves. Cut-off or expansion valves. Piston valves. Drop valves. Balanced valves. Valve rods and guides. Eccentric rods. Eccentric straps and sheaves. Governors.

Internal combustion engines. Cams and cam gear. Valves and spindles. Water jackets.

BOILERS.—Land, locomotive and marine types.

HYDRAULIC MACHINERY.—Construction of pumps and accumulators. Joints.

MACHINE TOOLS.—Lathes. Drilling machines. Planing machines. Shaping machines. Slotting machines. Milling machines. Grinding machines.

Different forms of tools and cutters. Cutting angles and speeds.

MATERIALS.—General properties of materials used in machine construction, including cast iron, wrought iron, steels, copper, brass, gunmetal, bronze, and white metal.

STRENGTH OF MACHINE PARTS. The design of pieces subject to combined bending and torsion.

BOILERS.—Design of boiler details, such as safety valve, stop valve, feed check valve, rivetted joints—simple feed pumps.

STEAM ENGINES.—Calculation of sizes of various parts of steam engines. Design of a simple slide valve gear to produce a given distribution of steam. Design of cylinders, pistons, main bearing connecting rods, cross heads, cranks and simple engine frames.

Design of hangers, clutches, couplings, pulleys, spur wheels and pedestals.

ENGINE AND MACHINE DESIGN.

Lecturer :
C. B. OUTON.

Tuesday, 7.30 to 9.35.

Students in this class will be prepared for the Higher Examinations, Board of Education, City and Guilds Mechanical Engineering, &c.

The design of crank pins, crank shafts for strength and bearing pressure.

Various types of couplings, clutches. Friction couplings, motor car type.

Calculations and design of various forms of rivetted joints. Efficiencies. Strength of boiler flues and stays.

Bolts, nuts, screws, &c. Working stress. Fatigue of bolts. Steam tight joints. Breaking strength. Thickness of flanges.

Steam pipes and pipe connections. Boiler tubes. Expansion joints. Joints for hydraulic pipes.

Calculations and design of cotters and cottered joints. Strength of knuckle joint pin. Gearing chains.

Various forms of bearings, journals and hangers, &c. Allowable pressure on bearings. Work absorbed by bearings, &c.

Roller and ball bearings. Conical rollers for thrust bearings. Ball journal bearings. Lubrication.

Design of toothed gearing. Forms of teeth. Arc of action ; arcs of approach, and recess. Obliquity of action. Involute teeth.

Bevel wheels. Strength of wheel teeth. Arms of fly wheels. Strength of built wheels. Helical form of teeth. Worm and worm wheels.

Various forms of friction gearing. Crown friction gear. Bevel friction wheels.

Belt gearing. Joints in belting and belt fasteners. Limiting distance between shafts. Use of guide pulleys. Strength of pulley arms. Split pulleys.

Rope gearing. Pulley grooves. Friction of rope. Horse power transmitted by ropes.

Wire rope gearing. Strength of wire ropes. Telodynamic transmission. Long distance driving. Aerial cable ways. Power transmitted. Deflection of ropes.

Chains, strength of. Chain fittings. Proportions. Lubrication. Proportion of crane hooks. Straining actions. Shackles.

Steel and iron tanks. Inside and outside flanges. Tank stays. Thickness of plates. Jointing materials. Capacity and weight of contents.

The design of pistons and piston rods. Piston packings. Strength of conical pistons and covers. Pistons for internal combustion engines. Strength of piston rods.

Forms of Crossheads and Guides. Forces acting at the crosshead. Crosshead gudgeon pins. Size of bolts.

Various types of connecting rods. Length, thrust and strength. Rods for internal combustion engines. Coupling rod ends. Lubrication.

Engine eccentrics. Forms of sheaves and fittings. Force required to move a slide valve. Strength of eccentric straps and rods. Setting of valves and eccentrics.

Design of cylinders for simple engine of given horse power.

Design of boilers of given evaporative capacity.

Materials used in construction of machines. Various forms of self hardening steel. Phosphor bronze. Alloys for bearings.

General hints on designing machines and machine frames.

PRACTICAL PLANE AND SOLID GEOMETRY.**STAGE 1.**

Lecturer :

C. B. OUTON.

Demonstrator :

R. J. DOWLING.**Friday—Lecture, 7.30 to 8.30.****Drawing, 8.35 to 9.35.****PLANE GEOMETRY.**

Proportionals.

Sine, cosine, and tangent of an angle. Circular measure.

The construction and use of scales.

Problems on lines and circles.

Construction of similar figures and their properties.

Areas of plane figures.

Problems on the ellipse.

Vectors. Addition and subtraction. Problems on uniplanar forces.

Introduction of Solid Geometry.

Points and Lines. Projections in space.

Views of Solids in simple positions.

Alterations of ground line.

Horizontal projection.

Inclined and vertical planes and plane figures. Sections.

Projections of geometrical solids with faces inclined.

Oblique planes.

Special treatment and facilities will be given to Students who want to learn a little Geometry as ancillary to one of the Department's Technical Courses.

STAGE 2.

Friday—Lecture, 8.35 to 9.35.
 Drawing, 7.30 to 8.30.

PLANE GEOMETRY.

- Trigonometrical tables.
- Similar rectilineal figures. Areas.
- Circles and lines in contact.
- The Link Polygon. Application. Reciprocal figures.
- Conic sections, properties of. Tangents and Normals.
- Special curves. Heart Cam.
- Loci from tabulated data.
- Cycloids and trochoids.
- Plotting on squared paper.
- Solution of equations by graphs.
- Solid Geometry. Doubly-inclined lines.
- Problems on the straight line and plane.
- Projections of regular solids.
- The oblique plane. Various problems on sections, common intersections.
- Horizontal projections.
- Plane and solid figures in given positions.
- The projection of curves and curved surfaces.
- Tangent planes to surfaces.
- Surfaces in contact.
- Intersection of surfaces.
- Cast shadows.
- Metric projections.

ENGINEERING (Junior).

All Students in this Department should attend one of the Classes in Engineering Mathematics, unless they have already had equivalent instruction, or are getting it otherwise.

PRACTICAL MECHANICS.

Lecturer :

E. E. JOYNT.**Tuesday, 7,30 to 9,35.**

This class is introductory to the study of Applied Mechanics and Heat Engines. It will consist partly of lectures and partly of exercises. Simple calculations bearing on practical matters will be made by the Students.

Force : Measurement of Force. Unit of Force.

Equilibrium. Resultant. Parallelogram and Triangle of Forces. Composition and Resolution of Forces. Applications in Machinery.

Work and Horse-Power. Graphical representation and calculations.

Elasticity: Stress and Strain.

Friction: Its effects and uses.

Practical illustrations of the above, and various exercises, graphical and mathematical.

Heat and Temperature. Units.

Transmission of Heat. Conduction through Furnace plates.

Steam and its properties.

Heat and work. Mechanical Equivalent.

Illustrations and Exercises.

ENGINEERING (Intermediate.)

APPLIED MECHANICS.—STAGE 1.

Lecturer :
J. TAYLOR.

Tuesday—Lecture, 7.30 to 8.30.
Laboratory, 8.35 to 10.5.

Unit of force, measurement of force. Composition, resolution and equilibrium of forces. Moments. Couples. Centre of Gravity.

Work—Graphical representation—Horse Power. The principle of work and its application to simple machines.

Friction and the efficiency of simple machines. Transmission of motion by belts and wheel trains.

Angular velocity.

Stress, strain, and elasticity.

Composition of displacements and velocities. Acceleration. Laws of motion. Uniformly accelerated rectilinear motion.

Elementary Hydraulics.

HEAT ENGINES.—STAGE 1.

Lecturer :
J. TAYLOR.

Thursday—Lecture, 7.30 to 8.30.
Laboratory, 8.35 to 10.5.

Heat Engines: Thermometry. Measurement of heat quantity. Latent and specific heat. Energy in its various forms. Their equivalence. Joule's equivalent. First law of thermodynamics.

Properties of steam. The temperature pressure relation of saturated steam.

Steam Tables.

Heat energy contained in a given weight of dry saturated steam ; of wet steam ; of superheated steam. Determination of degree of wetness, and degree of superheat of steam.

Production of steam. General description of a steam boiler. Superheaters. Feed water heaters.

Calorific value of fuels. Air supply required per pound of coal. Products of combustion. Methods of maintaining air supply. Natural draught. Forced draught. Grate area. Transmission of heat from furnace gases to the water in the boiler. Heating surface. Conditions that determine the transfer of heat across the heating surface. Pounds of fuel required in practice to evaporate one pound of water to dry saturated steam.

Steam Boilers: Different types of boilers: Lancashire, locomotive, water tube, marine. Grate area. Heat transmission. Heating surface. Boiler efficiency. Mechanical stokers. Economisers. Feed water heaters. Superheaters: integral and separately fired. Feed pumps and injectors. Safety valves. Results obtained in boiler practice.

Steam Engines: The steam engine cylinder. The indicator and indicator diagram. Points of cut off, release, compression, and admission. The average effective pressure. Calculation of horse power. Clearance volume. Work done per cubic foot of steam. How it depends on back pressure.

Problems in the simple slide valve. Setting of slide valve.

ENGINEERING (Senior A.).**APPLIED MECHANICS.—STAGE 2.**Lecturer :
J. TAYLOR.**Wednesday—Lecture, 7.30 to 8.30.**
Experimental Work, 8.35 to 10.5.

Applied Mechanics: Resultant of a system of forces in one plane. Forces in hinged structures. Forces in girders and trusses.

Moments of forces. Couples. Centres of gravity. Moments of inertia. Moments of areas.

Elasticity. Stress and strain. Tensile, compressive and shearing stresses.

Extension, compression and shearing strains. Modulus of elasticity and resilience.

Ties and struts. Effect of form of cross-section, length and manner of fixing its ends, on the strength of a strut or Pillar. Thin vessels subjected to internal fluid pressure.

Bending moments and shearing forces.

Moments of resistance of beam sections.

Strength and stiffness of shafts. Torsional strength of shafts.

Properties of materials. Cast iron, wrought iron, steels, copper, aluminium, brasses, bronzes, white metal, delta metal.

Testing of materials in tension, compression, bending, or torsion. Stress-strain diagrams. Elastic limit, yield point, ultimate strength. Extension. Elongation. Reduction of area. Effect of sudden loads.

Mass and Densities. Momentum and Impulse. Time and space average of force. Energy. Work. Power. Sliding and rolling friction.

Centrifugal force. Reciprocating motion and vibration. Balancing.

Mechanisms. Conversion of motion. Belts, ropes, chains; wheel trains. Lifting tackle. Screws. Cylindrical bearings. Ball and roller bearings. Couplings and clutches.

Hydraulics. Fluid pressure. Changes of velocity and pressure along the steam lines in fluids. Friction in pipes. Impact of jets on fixed or moving vanes.

Force pump. Hydraulic press. Hydraulic jack. Venturi and other meters. Water turbines. Centrifugal pump.

ENGINEERING (Senior B.).**HEAT ENGINES.—STAGE 2.**

Lecturer :
J. TAYLOR.

Friday—Lecture, 7.30 to 8.30.

Experimental Work, 8.35 to 10.5.

Steam Engines : Cylinder condensation. Leakage. Best cut off. Steam jackets. Drainage of cylinder. Advantage of superheated steam. Expansion in stages, in two or more cylinders. Arrangement and proportions of cylinders in compound engines.

Surface condensers. Circulating pump. Air pump. Jet condensers. Cooling towers.

Piston and Piston rod. Connecting rod. Crank. Inertia stress in coupling rod. The slide valve. Lap. Piston valves. Drop valves. Corliss valves.

Valve gear. Valve diagrams.

Reversing motions. Link motion.

Governors. Watt governor. Spring-loaded governor. Shaft governor. Governor and trip gear.

Inertia of reciprocating parts. Crank effort diagram. Fly wheels.

Balancing of engines. Balancing of revolving masses. Balancing of reciprocating masses.

Testing of steam engines. Brake horse power. Mechanical efficiency. Thermal efficiency. The use of the temperature—entropy diagram.

Steam Turbines : Nozzles. Determination of steam velocity for a given pressure drop. The velocity diagram. Impulse and Pressure Turbines. De Laval, Parsons, and Curtis Turbines.

Internal Combustion Engines : Laws of gases. Properties and calorific values of oils and gases. Gas producers. Air required for complete combustion. The Otto-cycle gas and oil engines. Ignition. Indicator diagrams MEP and HP. Mechanical efficiency and balance sheet. Ignition arrangements.

The Petrol engine. Carburetters. Water circulation. Sparking plugs. Methods of producing the spark. The Diesel oil engines. The explosion pump.

STRUCTURAL DESIGN.

Lecturer :
J. TAYLOR.

Monday—Lecture, 7.30 to 8.30.

Design, 8.35 to 9.35.

Strength of materials ; graphic statics ; design of joists and pillars.

Rolling loads ; equivalent distributed dead load.

Compound stress in web of plate girders ; Rankine's ellipse of stress and its application to Machine design.

Roof design ; Machine design.

MECHANICAL ENGINEERING.

(For Students taking the Examinations of the City and Guilds of London Institute).

LECTURE CLASSES.

For Ordinary Grade, see Classes in Applied Mechanics on Wednesday, 7.30 to 10.5, and in Heat Engines on Friday, 7.30 to 10.5.

For Honours Grade, see Classes in Engine and Machine Design on Tuesday, 7.30 to 9.35, and in Structural Design on Monday, 7.30 to 9.35.

WORKSHOP INSTRUCTION.

Demonstrators :
JOHN TAYLOR.
R. J. DOWLING.

TURNERS' WORK.

Instructor :

Monday, Tuesday, Wednesday, or Thursday, 7.30 to 9.35. P. PUZZAU.

HAND LATHES.—Use of the hand lathe ; the different forms of tools required in working upon various metals ; striking and chasing threads in the hand lathe ; chucking work in the hand lathe.

SLIDE AND SCREW-CUTTING LATHES.—Use of the slide lathe in turning, boring, and surfacing different kinds of work ; the method of finding the wheels required in order to cut screws of various pitches ; the cutting of single, double, and treble threads, both external and internal ; cutting speeds for various metals ; correct forms of tools required in lathe work ; various methods of chucking work in the lathe ; the use of outside and inside laps, and the precautions necessary in order to produce accurate cylindrical work, such as plug and ring gauges.

MACHINE TOOLS.—Use of the planing, shaping, slotting, and drilling machines, and the best methods of fixing work to be operated upon by these machines ; forms of the tools required, and the manner of grinding the same.

CUTTING TOOLS.—Special attention will be given to the proper formation of cutting tools and their edges.

The construction and working of the various machines in the school workshop will be thoroughly explained, and short lectures on practical work will be given each class evening.

In all the Workshop Classes, Students are entitled to work on one evening only.

FITTERS' WORK.

Instructor :
J. MANNING.

Monday, Tuesday, Wednesday, or Thursday, 7.30 to 9.35.

Use of the hammer, chisel, and file in the preparation of flat and other surfaces ; the making of keys and keyways for shafts and pulleys ; use of gauges and templets in fitting work ; use of the file and scraper in the preparation of plane surfaces, such as straight edges and surface plates ; use of compasses, scribing blocks, square, etc., in marking out work preparatory to its being machined ; the use of drifts in finishing square and other shaped tools.

SMITHS' WORK.

Instructor :

H. TAYLOR.**Monday, or Friday, 7.30 to 9.35.**

The care of the fire.

Articles will be made illustrative of the characteristics of wrought iron as to its fibre and contraction, and the various methods of work.

Steel.—Its uses in the making of machine and hand tools, springs, etc. ; also in conjunction with iron as in tools for wood-working.

Brazing will also be introduced as a useful auxiliary to smiths' work.

Short discourses on the production and properties of metals, and on their treatment.

PATTERNMAKERS' AND MOULDERS' WORK.

Instructor :

M. REILLY.**Monday, Tuesday, Wednesday, or Thursday, 7.30 to 9.35.**

Instruction will be given in the practice of patternmaking and in the moulding of brass and iron.

The castings made by this class will be utilised by those in the fitting and turning course.

BRASS FINISHERS' WORK.

Instructor :

J. T. DUIGNAN.**Wednesday, 7.30 to 9.35.**

A Class was started in this subject during the past Session, and the experiment will be continued during the coming Winter. Instruction will be given in Turning and Fitting. A Brass Finisher's Lathe and a Brazing Hearth have been provided.

MANUAL INSTRUCTION IN METAL WORK.

Instructor :

Friday, 7.30 to 9.35.

A Class will be formed for Manual Instruction in Metal if sufficient Students apply before October 31st.

SURVEYING.

Teacher :

Tuesday, 7.30 to 9.35.

Arrangements for practical work are to be made at suitable times.

CHAIN SURVEYING.—Setting out right angles with the chain, and the Optical Square. The chaining of lines on sloping ground by stepping, and by aid of the Abney level. Keeping the Field Book. Plotting the Survey. Area from plan and from Field Book notes.

COPYING PLANS.—Enlarging and reducing.

COMPASS SURVEYING.—Traversing with the Compass and Chain. Closing the Traverse by distributing the error. Use of the Circumferentor.

BOX-SEXTANT.—Construction and adjustment of the horizon glass. How to use the Box Sextant in Traversing and in Triangulation.

THEODOLITE SURVEYING.—The construction: the adjustment, temporary and permanent of the Theodolite. How to use the Theodolite in traversing, and to make a Theodolite survey from a given base line. Measuring base line accurately. Plotting of Theodolite Survey.

LEVELLING.—The Dumpy Level. Its construction. The adjustment, temporary and permanent, of the Dumpy Level. Method of keeping the Level Book. Setting out of drains at definite slopes. Construction of Contour Maps. Curve Ranging.

AEROPLANE MODELLING.

Teacher :

Monday, Wednesday and Friday, 7.30 to 9.35.**R. W. TAYLOR.**

This Class is intended to teach the construction of Model Aeroplanes, and for experimental work in connection with the same. Students will be assisted to construct Models in the Practical Class, and the instruction will be supplemented by occasional lectures. The fee will be 7/6 per Session, giving admission to three classes per week.

Electrical Engineering.

HEAD OF DEPARTMENT—THOS. TOMLINSON, B.E.

ELECTRICAL ENGINEERING, Lectures.

ELECTRICAL ENGINEERING, Laboratory.

WIREMEN'S WORK.

CABLE JOINTING.

ELECTRICAL ENGINEERING.**FIRST YEAR.****PREPARATORY.****Tuesday, 7.30 to 10.5.****or Friday, 7.30 to 10.5.**

In their First Year Electrical Engineering Students attend the Electricity and Magnetism Lecture and Laboratory on Tuesday or Friday, in Bolton Street.

Students of Electrical Engineering are expected to attend one of the Classes in Engineering Mathematics, unless they have already had sufficient instruction in Mathematics, or are getting it otherwise.

ELECTRICAL ENGINEERING.**SECOND YEAR.****LECTURES (Junior).**

Lecturer :

T. TOMLINSON.**Monday, 7.30 to 8.30.****and Thursday, 7.30 to 8.30.**

The Solenoid. Electro-magnets. The magnetic circuit. Permeability.

Electro-magnetic induction. Simple theory of the dynamo. The construction and functions of the different parts of a direct current dynamo. Shunt series and compound windings. Deduction of the formulae for the generated volts. The electric motor, general principles of action. Relation between field strength and speed. Starting and regulating resistance. Reversal of rotation. Series and shunt motors. Commonly occurring faults and wrong connections. Use of various forms of bridge for measuring resistance. Very low resistances. Insulating resistances. Use of Potentiometer. The principles of construction of commercial measuring instruments.

The electrical and mechanical properties of conductors and insulators.

Secondary cells. The various types. Installation and practical treatment.

Electric lamps and lighting. Tests and calculations. Direct current transmission and distribution circuits.

LABORATORY.**Monday 8.35 to 10.5.****and Thursday 8.35 to 10.5.**

LABORATORY.—Practical experiments in the foregoing.

NOTE.—In addition to the theoretical examination, candidates may be required to produce evidence that they have followed a satisfactory course of practical work in the foregoing Syllabus.

THIRD YEAR.**INTERMEDIATE.****Wednesday—Lecture, 7.30 to 8.30.****Laboratory, 8.35 to 10.5.**

Elementary consideration of alternators, and sine waves of induction. Maximum and effective or R.M.S. values of volts and current. Frequency. Effects of self-induction; vector diagrams; angle of lag; Wattless current. Capacity and its effects. Circuits containing resistance capacity and self-induction. Resistance. Harmonics. Skin effect.

Impedance of choking coils. Effects of resistance, air gap, and frequency. Calculations on parallel alternating circuits. Relations between main and branch currents.

Theory of transformers. No load and full load diagrams.

Regulation of a transformer. Calculation of efficiency.

Losses in a transformer. All-day efficiency. Curves of performance.

Auxiliary, constant current, and instrument transformers.

The alternator. Armature and field construction. Polyphase working. Star and mesh connections. Phase and line currents and volts.

Calculations and measurements of three-phase power.

Armature reactions in an Alternator.

Losses in, and efficiency of, Alternators at various loads.

Rotating field with polyphase currents.

Induction Motors. Starting current and torque. Slip.

Effect of motor resistance on speed torque curves.

Methods of starting induction motors.

Alternating current Ammeters, Voltmeters, and Wattmeters.

Synchronisers. Power factor meters and frequency meters.

LABORATORY.—Practical experiments in the foregoing.

N.B.—In special cases, where Students happen to be working for a particular Examination, whose subject matter does not coincide with any one of the Syllabuses here quoted, it will be competent for the Lecturer to allow them to attend the lectures of two successive years for the same fee.

FOURTH YEAR

SENIOR CLASS.

Tuesday, Lecture, 7.30 to 8.30.

Laboratory, 8.35 to 10.5.

CONTINUOUS CURRENT.—Scientific and commercial units and measurements.

Measuring instruments and testing.

The electrical and mechanical properties of materials ; conductors, insulators.

The magnetic properties of materials ; laws of the magnetic circuit and calculations thereon.

C.C. Generators and Motors ; principles of, and essential parts ; elements of design and simple calculations connected therewith ; calculations of and tests for losses and efficiencies.

Secondary batteries ; principles of ; usual forms, testing. Setting up and maintenance.

Electric lamps and lighting ; glow, arc, mercury, vapour, and other lamps ; principles involved, use and testing.

Power transmission and distribution by continuous currents.

Electric traction by continuous currents.

ALTERNATE CURRENT.—Principles of alternate current working ; elementary mechanical theory ; units and simple measurements.

Alternate current power, principles and details of measurement of.

A.C. generators and motors ; principles of and essential parts, elements of design and simple calculations connected therewith, various types of motors ; circle diagrams ; testing.

Transformers and converters ; necessity for ; various types ; elements of design ; simple calculations ; testing.

Power transmission and distribution by alternate currents.

Electric traction by alternate currents.

LABORATORY.—Practical experiments on the foregoing.

ELECTRIC WIREMEN'S WORK.

FIRST YEAR:

Lecturer :

J. P. TIERNEY.

Monday, Lecture, 7.30 to 8.30.

Laboratory, 8.35 to 10.5.

Friday, Laboratory, 7.30 to 9.35.

Students should attend the Lectures and Laboratory in Electricity and Magnetism, Junior on Tuesday or Friday ; and if possible, the Class in Workshop Mathematics.

ELECTRICITY.—Elementary principles, terms, units, batteries, cells.

Simple calculations.

Electric bells, indicators, relays.

Electric lighting, switches, and accessories.

Fuses and fuse boards.

Conductors, gauge, properties, capacities, resistances, and construction.

Insulators, uses, values.

Joining wires and cables.

Wiring systems.

Erection, wiring, and fitting installations.

Testing with detector lamps, &c. Testing insulation.

Connections. Motors.

Telephones.

LECTURE (Second Year).**Monday, 7.30 to 8.30.****Thursday, 7.30 to 8.30.**

The Second Year Wiremen take the lectures in the Junior Electrical Engineering, and may take the Laboratory as well, 8.35 to 10.5. They should also take the Class in Engineering Mathematics, or in Technical Drawing.

ELECTRICAL JOINTING.**PRACTICAL (First Year).**

Instructors :

J. P. TIERNEY.**J. ROTHWELL.****Monday, 8.35 to 10.5.****Friday, 7.30 to 9.35.**

Methods of handling wire and cable.

The soldering iron. Methods of thinning and heating fluxes. Solder making and testing, sweating and preparing thimbles and lugs, making the following joints :—Running end to end, T and Y in 1/18, 3/22, 7/16, 19/16. Connecting to ceiling roses, switches, plugs, holders, and distribution boards. Methods of connecting flexibles. Wiring of three-light ball fittings and electroliers; insulating joints. The connecting up of simple bell and lighting circuits. Looping and strapping.

Running of wires on cleats and insulators. Running of wood casing and capping; mitre cutting.

Cutting, screwing, and bending metal pipes and conduits.

Sorting out circuits by means of the test lamp and detector.

PRACTICAL (Second Year).**Tuesday, 7.30 to 9.35.****Friday, 7.30 to 9.35.**

Joints on cables up to $\frac{1}{2}$ square inch sectional area. Jointing and connecting of lead-covered cables. Making and installing fuses of various capacities. Installation of conduit and conduit fittings. Repair and adjustment of open and enclosed arc lamps. Nernst lamps; connections and renewal of parts. Installation testing with Ohmmeter and generator. Overhaul of motor starters. Brush adjustment on motors and generators. The making of vulcanised joints. Drawing diagrams of switchboard connections, motor circuits, &c., Erection of accumulators. Measuring up work. Estimating.

Building and Allied Trades.

HEAD OF DEPARTMENT—RICHARD COULSON, F.S.I.

TECHNICAL DRAWING.

PERSPECTIVE DRAWING.

BUILDING CONSTRUCTION.

BUILDERS' QUANTITIES.

CARPENTRY AND JOINERY.

DRAWING FOR BRICKLAYERS AND MASONS.

PLUMBING.

PLASTERERS' WORK.

PAINTERS' AND DECORATORS' WORK.

DRAWING FOR PAINTERS AND DECORATORS.

METAL PLATE WORK.

CABINETMAKERS' WORK.

STONE AND MARBLE CARVING.

WOOD CARVING.

ORNAMENTAL IRON WORK.

} See pp. 181 to 184.

TECHNICAL DRAWING.

Lecturer :

M. J. BURKE.**Wednesday, 7.30 to 9.35.**

Simple drawing exercises involving use of T and set squares only.

Making hand sketches, fully dimensioned, on squared paper of full size models of simple parts of a building, and preparation of working drawings to large scale from such sketches.

Division of lines into proportional parts.

Construction of triangles, quadrilateral figures and polygons. Application to practical problems.

Circular and other curved figures. Applications to mouldings, arches, and similar work.

Angles and angular measurement.

Construction and use of scales of various sorts. Problems.

Further hand sketching and drawing to smaller scales of more difficult models of a practical character.

Cross multiplication and simple mensuration.

Estimation of labour and materials according to local methods.

Further and more difficult drawing from models and tools.

Isometric sketching and drawing.

Enlarging and diminishing figures such as profiles of simple mouldings.

Solid Geometry. Names and definition of simpler solids.

Projection of lines, planes, and solids on planes at right angles.

PERSPECTIVE DRAWING.

Lecturer :

M. J. BURKE.**Saturday, 2.30 to 4.30.**

A Class in this Subject will be held if twelve Students make application before Nov. 1.

BUILDING CONSTRUCTION.

Lecturer :
RICHARD COULSON.

Demonstrator;
M. J. BURKE.

STAGE 1.

Monday—Lecture, 7.30 to 8.30.

Drawing, 8.35 to 9.35.

The properties of materials will be illustrated by experiments in the Laboratory.

DRAWING.—The making of Freehand Sketches. Tracing and working Drawings. Orthographic, Isometric, Oblique Projection and Perspective. Squared paper for sketching.

MATERIALS.—Materials used in Building; their origin and properties.

TIMBER.—Growth. Structure. Conversion and Seasoning Varieties. Uses. Laboratory Tests.

Beams, floors, and trusses.

BRICK.—Composition and manufacture. Laboratory Tests.

STONE.—Origin and properties. Laboratory tests.

LIME.—Nature and properties. Mortar and Cement. Laboratory tests.

FOUNDATIONS.—Foundations and footings in ordinary soils. Damp-proof Courses.

BRICKWORK.—Simple bonds in brickwork in plain walling. Sleeper walls. Segmental and semi-circular gauged arches. Names and properties of various kinds of bricks in general use: purposes for which each is specially fitted.

MASONRY.—Varieties of rubble and ashlar walling. Plain work on sills. Wall copings. Characteristics of sandstones, limestones, granite, and igneous rocks.

CARPENTRY AND JOINERY.—Single floors. Trimming around well holes and fireplaces. Stud partitions.

Ordinary roofs, including the King-post truss.

Construction of ledged, braced, framed and panelled doors. Door frames and plain jamb linings. Fixing of skirtings and architraves.

Construction of cased frames and double hung sashes. Casement frames and sashes.

SLATING.—Explanation of terms used in Slaters' work. Cutting and fixing of slates. Treatment of eaves and ridges.

PLUMBING.—Lead gutters and flashing.

PLASTERING.—Composition of various coats of plaster. Ordinary lathing and plastering of internal walls, ceilings and partitions.

STAGE 2.

Tuesday—Lecture, 7.30 to 8.30.

Drawing, 8.35 to 9.35.

The lectures will be supplemented by Demonstrations and Experimental work in the Laboratory, in illustration of the properties of materials.

CEMENT AND MORTAR.—Various mixtures and properties.

CONCRETE.—Composition and manufacture. Uses and properties.

FOUNDATIONS.—Precautions to be adopted in excavations in various soils, with necessary strutting and timbering. Concrete foundations for walls and piers. Damp-proofing of basements and ventilating of underground floors.

BRICKWORK.—Bricks, tiles and drain-pipes. Bonding in junction of walls at right angles. In fireplaces and flues. Finishing of chimney stacks. Hollow walls and methods of bonding. Construction of flat, elliptical and pointed arches. Corbelling. Laboratory tests.

MASONRY.—Masonry walls, bonds, ground and copings. Stone dressings. Joints and fastenings in stonework. Corbelling. String courses and cornices. Arches. Wellknown building stones: quarrying, cutting, &c.

Laboratory tests.

CARPENTRY AND JOINERY.—Construction of double and framed floors. Centres for segmental and circular arches to 15 feet span. "Flitch" beams. Queen-post and composite roof trusses up to 40 feet span. Preparing flat roof for plumbing. Construction of box and taper gutters. Trimming around skylights, chimneys, &c. Self-supporting wood partitions. Construction of doors in hard and soft woods. Various methods of finishing panels. Framed and panelled jamb linings. Vestibule doors and frames. French casement windows. Pivot hung windows. Construction of skylights. Dog leg and open newel stairs.

SLATING.—Roof pitches and coverings: various methods of fixing. Slating, tiling, gutters and leadwork.

PLUMBING.—Leadwork on roofs, gutters, and flats, with rolls, drips, &c. Various joints used in plumbing.

SANITARY WORK.—Principles of sanitation. Laying and jointing of glazed stoneware and iron pipes. Connection with main sewer. Ventilation of drains. Varieties of traps and gullies. Testing.

PLASTERING.—Plasterers' work of all kinds; composition of materials used.

PAINTING AND GLAZING.—Properties and qualities of pigments, varnishes and oils: use in house painting. Window glazing.

STAGE 3.

Tuesday, 7.30 to 9.35

DRAWING.—Making of finished drawings.

APPLIED MECHANICS.—Testing of materials by Compression, Tension, and Bending. Practical illustrations in the Laboratory.

BEAMS.—Bending Moment ; Moment of Resistance ; Moment of Inertia. Framed Structures. Experimental Work in Laboratory.

FOUNDATIONS.—Foundations of all kinds in different situations : construction and treatment. Excavation for cellars and Basements.

BRICKWORK.—Composite walls. Retaining walls. Arching and Vaulting. Sewer construction.

MASONRY.—Various walls, and other work. Arching and Vaulting. Stairs. Copings, Dressings, Lintels and Corbels.

PLASTERING.—Special work. Cornices and enrichments.

CEMENT.—Manufacture of Cement. Various uses. Testing of Cement in the Laboratory.

CONCRETE.—Monolithic, Block and Reinforced. Uses in Engineering and in Building construction. Floors, Arches and Bridges.

CARPENTRY AND JOINERY.—Shoring and Underpinning. Scaffolding and Staging. Gentries and Derrick Towers. Temporary Structures. Casing and Centering for Concrete walls and floors, and for brick or masonry arches. Timber roof-trusses of Mansard, Hammer-beam, and Composite types. Stairs of newel and geometrical types. Machinery used in preparation of Joinery Work.

PLUMBING AND SANITARY WORK.—Fresh water supply : storage and distribution : pipes and fittings. Domestic hot water services : different systems. Baths, Lavatories, Sinks, &c., Drainage works. Sewage. Ventilation. Sanitary materials and construction.

IRON AND STEEL WORK.—Columns, Stanchions, Ties, Beams, and Girders. Design for steel-framed Building.

DEMONSTRATION CLASS.

Demonstrator :
RICHARD COULSON.

Saturday Afternoon, 3 to 5 (or as may be arranged).

Visits will be paid to quarries, works, and manufactories connected with the building trade, so that the methods or processes of obtaining or producing, or manufacturing the various materials may be seen and explained in actual working. Arrangements will also be made, where possible, to inspect important buildings or other works in course of erection or construction in or near the city.

Students must pay their own travelling or other expenses.

BUILDERS' QUANTITIES.

Lecturer :
RICHARD COULSON.

Wednesday—Lecture, 7.30 to 8.30.
Practice, 8.35 to 9.35.

Students taking this subject must have a good knowledge of Building construction and drawing.

ORDINARY STAGE.

Methods of taking off, squaring, and reducing dimensions.

Excavation to surface, basements, and trenches.

Timbering to excavations.

Concrete footings, walls, and floors.

Timber casing and centering.

Abstracting and billing.

Drainage.

Brickwork.

Masonry work.

Carpentry work, floors, partitions, and roofs.

Slating and tiling.

Leadwork to roofs.

Iron and steel work.

Joinery work, doors, windows, and stairs.

Plaster work.

Internal plumbing.

Glazing and painting.

Abstracting, billing, and pricing.

Home work will also be given, strict attention to which is absolutely essential to satisfactory progress in the subject.

HONOURS STAGE.

Wednesday, 7.30 to 9.35.

Facilities will be provided, under the supervision of the Lecturer, for practice in taking off and billing from drawings and specifications of executed works, enabling students to acquire knowledge of the measuring and pricing, in accordance with local rates, of all the branches of work in connection with ordinary buildings of the domestic or commercial type.

BUILDING TRADES.**CARPENTRY AND JOINERY.****JUNIOR CLASS.**

Instructor :

Tuesday, 7.30 to 9.35.

Hand tools, their names, shapes, and uses.

Woods in common use, their names and descriptions.

Mouldings, their shapes and names.

Parallelogram and triangle of forces. Composition and Resolution Graphical methods.

Moments due to parallel forces as in beams.

Determination of specific gravity.

Plans, elevations, and sections of simple solids.

Oblique and isometric projection of solid figures, and of the principal joints used.

Setting out roof trusses, door and window frames, including circular and elliptic curves. King-post truss.

Single floors.—Trimming around well-holes and fireplaces. Skirtings. Partitions. Construction of doors and door-frames of various types. Window-frames and Sashes. Casement Frames.

INTERMEDIATE CLASS.**Thursday, 7.30 to 9.35.**

Nature and properties of various timbers, where grown, ports of shipment, identification marks, defects to be avoided, conversion, seasoning, strength, and preservation.

Scantlings for beams, joists, partitions, and roofs, the various joints employed, and the bolts, straps or stirrups used to secure or strengthen them.

Flooring boards, matched boarding, roof boarding, battens, tilting fillets, gutters, flats, and cess-pits.

Weather-boarding and weather boards, throating and condensation grooves or gullets in work exposed to weather.

Working drawings and setting-out rods for doors, windows, and other framed work : proportions of their different parts, tenons and dovetails.

Fixing wood trimmings, with beads or grooves for key to plaster-work.

Preparing roofs for plumbing. Special doors and frames. Panelling. Special Windows. Skylights.

Construction of double and framed floors.

Hinges, pivots, pulleys, locks, bolts, window fasteners, and other ironmongery.

Stairs of dogleg or open newel type, proportions of tread and riser, details of construction, and methods of support.

Timbering to excavations for cellars, walls, drains, and sewers.

Casing or shuttering and centering for concrete walls, floors, and roofs.

Centering for brick or masonry arches, and methods of easing and striking them.

Drawings for elliptic, four-centered, and other arches, with methods of obtaining normals and tangents.

Development and measurement of surfaces of solids, and method of obtaining dihedral angles in roof work.

Intersections of mouldings under various conditions, enlarging or diminishing, and finding true sections of raking mouldings or angle bars.

Graphic statics for determining stresses in girders, partitions, and roof trusses.

Strengthening beams and girders by flitching, trussing, and other means. Queen-post and composite roof trusses.

SENIOR CLASS.**Monday, 7.30 to 9.35.**

Conversion of timber for maximum strength and stiffness, or to obtain the best figure for joinery work.

Methods of testing strength of timber for structural purposes. Experimental illustrations.

Calculations of stresses in beams and cantilevers, and the designing of joints to withstand them.

Scaffolding, shoring, and staging. Gantries, and Derrick towers.

Temporary buildings and half-timber work.

Taking dimensions from buildings and planning stairs, detailing the various parts, construction of strings for geometrical stairs, face and falling moulds, ramps, wreaths, and scrolls in handrailing.

Setting out and developing curved work in niches, domes, and pendentives: intersections of raking and curved mouldings.

Fittings for domestic buildings, shops, offices, museums, churches, and other public buildings. Dormers, Turrets, and Lantern lights.

Labour-saving machinery, its management and control, and the general handling of work.

EXTRA PRACTICAL CLASS.**Friday, 7.30 to 9.35.**

Course Students who attend all their Classes with regularity will be permitted to continue their practical work on Friday evenings in the Workshop.

PLUMBING.**JUNIOR CLASS (Theory).**

Instructor :
JOHN BOLTON.

Tuesday, 7.30 to 8.30.

Arithmetic and Mensuration for Plumbers.

Properties of the Metals used by Plumbers.

Soft and Hard Alloys, composition and properties.

Soldering of Joints, seams and angles. Fluxes used.

Theory of Lead Burning. Use and care of machine.

Lead, its Ores and Compounds, its manufacture into sheets, pipes, straps, and bends.

Hydrostatics: Water pressure in pipes, tanks, cylinders and boilers. The Syphon.

The lining of sinks and cisterns with sheet metal.

Specific Gravity.

Pneumatics. Simple plans of ventilation.

Protective coatings to iron and lead pipes, &c.

Roof work. Preparation of Wood work. Use of drips, rolls, soakers, flashings, gutters and flats. The laying out and covering of gutters and flats with lead. Lead flashings.

Simple geometry and development of solids.

Oil and Rust cements, nature and use.

Pipe Bending.

Use of traps for sanitary fittings.

Heat and its effects. Frost.

Specific Heat and transmission of heat.

Simple systems of domestic heating.

JUNIOR CLASS (Practical).**Tuesday, 8.35 to 10.5.**

ROOF WORK.—Bossing up sheet lead for gutters, flats, &c., without reducing the thickness. The setting and cutting out of sheet lead for soakers and flashings. Setting out, preparing and soldering simple forms of cesspool boxes and rain water heads.

PIPE BENDING.—Bending Lead Pipes up to 2 inches by hand or with the use of sand, bobbins, or bending irons.

The making and testing of Solder.

Preparing and making Upright, Underhand, Flange and Branch joints with and without the use of plumbing irons.

Preparing and Soldering seams and angles for Cisterns and Sinks.

INTERMEDIATE CLASS.

Instructor :
JOHN BOLTON.

Thursday—Lecture, 7.30 to 8.30.**Drawing, 8.35 to 9.35.**

Mensuration for Plumbers.

Various modes of making Joints.

The laying out and covering of special gutters and flats. Roof Work. Rolls, drips, &c.

Covering ridges, hips and chimneys. Different forms of flashing.

The covering of Dormers and methods of securing the lead.

Ornamental lead work.

Setting out of cesspool boxes and soldering.

Hydrostatics and Hydraulics for Plumbers.

Hot water supply.—Cylinder and tank systems. Combined cylinder and tank systems.

Indirect systems for hard water districts.

Heating water by steam for domestic supply.

The selection and fixing of boilers, pipes and fittings.

Heating by hot water.—Low pressure systems. Arrangement and fixing. High pressure systems.

Water Supply.—Collecting and storage of water. Filters.

Water services, constant and intermittent supplies.

Pumps and Hydraulic rams.

Domestic Plumbing. Gas pipes. Hot and cold water pipes. Lead and copper. The making of joints. Taps.

Sanitary Plumbing.—Setting out and construction of house drains.

The arrangement and fitting of sanitary appliances.

Soil pipes. Waste and Antisiphonage pipes

Sewage disposal.

Testing the drains and sanitary fittings.

INTERMEDIATE (Practical).

Friday, 7.30 to 9.35.

ROOF WORK.—Setting from drawings, and bossing up sheet lead for gutters, flats, &c. Working down roll ends and drips. The warping of lead for circular gutters, &c. Setting and cutting out of soakers, step-flashing, cesspool boxes and rain water heads. Fancy lead work.

PIPE BENDING.—Bending drawn lead pipe up to four inch by hand or with sand, bobbins or dummies. Setting out sheet lead to form bends or set-offs, for use with rectangular pipe, with the seam soldered or burned up.

SOLDERING.—Preparing, fixing and soldering Upright, Underhand, Branch and Flange Joints as they occur in practice, up to four inch with and without the use of plumbing irons. Preparing and soldering flat and Upright seams or angles for Cisterns and Sinks.

LEAD BURNING.—Charging and using machine, preparing and burning seams in flat, sloping, horizontal, and upright positions. Preparing and burning Joints on Pipes.

COPPER PIPE WORK.—The loading and bending of Copper Pipes for hot water. Joints in use. Precautions in fixing.

SENIOR CLASS.

Wednesday, 7.30 to 10.5.

If Advanced Students enter for Plumbing, so as to justify the formation of a Senior Class, work will be arranged for them on Wednesday evenings as above. Special exercises will be arranged to suit their special needs.

EXTRA PRACTICAL CLASS.

Course Students who attend with regularity their Course Classes and Senior Students specially recommended by the Instructor, will be permitted to continue their practical work on one extra night in the week by arrangement.

PLASTERERS' WORK.

Instructor :
JAMES SAUNDERS.

JUNIOR CLASS.

Thursday, 7.30 to 9.35.

Tools used for shop work, modelling, building work and concrete.

Names and qualities of the various limes in use, distinctions between them, and methods of testing.

Various qualities of sand, their preparation and proportion of admixture for different limes and cements. Substitutes for sand.

Composition of various coats of plaster. Ordinary lathing and plastering of internal walls, ceilings and partitions.

Portland cement and its uses.

Cast Concrete Work.

Mixing tempering and manipulating stucco.

Pressed cement casting. Dry process.

Cutting Moulds.

Laths used in building work.

Running and mitring mouldings and fixing ornament.

Fibrous plaster and its uses.

Preparing brick and stone walls for plaster work.

Moulding and casting in wax and gelatine.

SENIOR CLASS.

Wednesday, 7.30 to 9.35.

Tests and analyses for limes, plasters and cements. Causes of hydraulicity and methods of imparting it.

Mode of gauging and using the various substitutes for lime plaster.

Setting out panelled ceilings and walls for solid and fibrous plaster.

Plastering plain and fluted columns and pilasters with an entasis.

Running and forming oval mouldings to given dimensions.

Moulding and casting in plaster, wax, gelatine, sulphur and Phelps's metal.

Methods of forming returned and break mitres, and pediments.

Measuring plaster work.

Quantities of materials.

Compositions used for decorative work.

The preparation of bracketing for plasterer's work.

SHOP WORK.—Waste moulding in plaster and wax; piece moulding from high relief and from the round; running plaster piece moulds; piece moulding in plaster, wax and sulphur. Moulding from life. Scagiola making and polishing. Gesso, composition, carton-pierre, fibrous plaster, plain face, and fibrous slabs.

MODELLING.—Modelling in clay, plaster, stucco, gesso, and cement.

'SGRAFFITO.—Description of materials, with proportion of quantities, and method of manipulation. Pouncing, cutting, and clearing out. Methods employed for work done *in situ* and on slabs.

Description and drawings of observed examples of work in Dublin or elsewhere.

PAINTERS AND DECORATORS' WORK.

Instructor :

THOMAS MARKEY.

Junior Class, Thursday, 7.30 to 9.35.

Extra Practical, Friday, 7.30 to 9.35.

Intermediate Class, Tuesday, 7.30 to 9.35.

BRUSHES, TOOLS, PLANT, AND APPLIANCES.—The names, description and use of brushes and other tools; the care and preservation of brushes, tools, and appliances.

MATERIALS.—The principal pigments, thinners, driers, used in painting; their uses and distinctive qualities; pigments adapted for use in oil or water.

PREPARATION.—The preparation of ceilings, walls, and wood-work; the methods of filling or otherwise producing a smooth surface for painting.

PAINTING.—The mixing and application of paints ; methods of finishing work.

ENAMELLING.—The various enamels in use ; the use of clear oil varnishes.

DISTEMPERING.—Methods of using different water paints ; pigments which are specially adapted for tinting various distemper bodies.

PAPER HANGING.—The preparation of pastes and adhesives ; necessity for interlining ; methods of trimming and hanging paper and relief materials.

IRONWORK.—The preparation of ironwork ; paints and vehicles required for ironwork ; mordants.

SIGN WRITING AND LETTERING.—The different styles of lettering ; setting out of signs ; lettering on different surfaces.

COACH PAINTING.—Special instruction for those engaged in Railway or other Coach painting works.

GRAINING.—The grounds for the various woods, the pigments used in graining, glazing ; combing, stippling, veining, pencilling, overgraining ; brushed and fumed oak effects ; methods of inlaying by grounding and brushing out process.

MARBLING.—Terminology of marbles, granites ; their suitability ; colours used in marbling ; glazes ; granites ; porphyries, grounds and how imitated ; methods of inlaying marbles for dadoes, bands.

VARNISHING.—The application of varnish, felting down and polishing.

Course Students who attend all their Classes regularly will be allowed to continue their practical work on one extra evening.

SENIOR CLASS.

Instructor :
W. F. NAGLE.

Monday Lecture, 7.30 to 8.30.

Monday, Workshop Instruction, 8.35 to 9.35.

Wednesday, Workshop Instruction, 7.30 to 9.35.

Laws in decoration and ornament.

Styles of Architecture. Distinctive features. Decoration.

Theory of Colour. Harmony and Contrast. Colour Combinations.

Making sketches and coloured scale drawings for scheme of decoration.

Preparation of full-sized details for craftsmen to work from.

Decoration in distemper.

Decoration of existing relief ornament.

Methods of using gold, silver and other metals. Preparing different grounds for gilding. Water gilding. Matt and burnish. Gilding on glass, plain and embossed.

Decorative schemes. Ceilings, walls, friezes, dadoes, panels, borders, &c.

Adapting ornament to suit requirement of spaces. Expression of material.

Gesso decoration and its treatment.

Preparing and cutting stencils for one or more colours. Application of stencils in decoration. Care of stencils.

Striping, lining, outlining.

Light and shade. Painting ornament in monochrome.

Painting ornament in colour.

Pounces and transfers, their uses.

Ornamental lettering, enrichment and colouring.

Decorative staining.

DRAWING FOR PAINTERS AND DECORATORS.

Instructor :

W. F. NAGLE.**Friday, 7.30 to 9.35.**

- Drawing simple designs for Friezes.
- Dado borders.
- String courses.
- Pilasters.
- Panels.
- Corner pieces.
- Breaks.
- Centres.
- Diapers.
- Simple heraldic devices.
- Ornamental lettering, short texts to scale.
- Making suitable drawings for imitation of inlaid woods, marbles, &c.
- Rough sketches for schemes of decoration.
- Making scales and working drawings for schemes of decoration.
- Working out sketches with measurements previously taken from existing buildings, and setting to given scale.
- Drawing of Historic Ornament.
- Sketches of Lunette, Cartouche.

THEORY FOR PAINTERS.

Instructor :

JOSEPH KING.**Wednesday, 7.30 to 9.35.**

- Pigments used in the Painting trade.
- Their uses and distinctive qualities.
- Various terms used in the trade.
- Brushes, tools, and plant. Description and uses of each, and their care and preservation.
- Preparation of surfaces previous to Painting.

The necessity of mixing Paint to suit the ground to which it is to be applied.

Mixing of colour for ordinary use, and method of application.

Varnishing. Preparation of grounds for Varnishing, felting down and polishing.

Distempering. Preparation, mixing and application of ordinary Distemper to grounds of different nature.

Elements of colour. Theory.

Removal of paint by burning off : Paint removers.

Different kinds of Graining.

Dimensions of different Paperhangings. Preparation of Pastes for hanging the different materials. Preparation of wall surfaces. Removal of old paper and hanging new paper.

Measurement of simple areas for Painters' and Paperhangers' work.

Simple tests for Varnishes and Pigments.

Use and application of Zinc White as distinct from White Lead.

Preparation of woods for staining in Oil, Water and Spirit.

Enamels. The preparation of grounds and application of Enamel.

Ironwork. Preparation of Ironwork. Application of paint for protection and decoration.

White Lead. The different qualities and simple tests.

Use and properties of various Water Paints, Oil and Turpentine substitutes.

METAL PLATE WORK.**LECTURE AND SETTING OUT OF PATTERNS.****JUNIOR CLASS.**

Instructor

G. PAPPIN.**Tuesday— Junior Lecture, 7.30 to 8.30.****Junior Drawing, 8.35 to 9.35.****Thursday— Junior Practical, 7.30 to 9.35.****Monday— Senior Lecture, 7.30 to 8.30.****Senior Drawing, 8.35 to 9.35.****Wednesday—Senior Practical, 7.30 to 9.35.**

If sufficient Students attend their Course Classes regularly during October, an extra Practical Class will be held on subsequent Fridays for those Students.

Geometrical problems suitable for Metal Plate Workers, on angles, circles, polygons, ovals, oblongs, &c.

The calculation of dimensions of vessels of given capacities. Sizes of main and branch pipes for stoves and ventilating purposes. Weights, sizes and gauges of sheets, wire, rivets, &c.

Setting out to scale the plans, elevations and patterns of simple articles of equal taper.

The development of right cones and patterns in two or more pieces.

Patterns for equal tapering bodies, round, oblong, or oval, in two or more pieces for large and small work.

Setting out patterns for unequal tapering bodies, such as hoods, hoppers, &c.

Lecture.—Fuels, their composition. Physical character and the modes of applying them in Metal Plate Work.

Setting out patterns for unequal tapering bodies of flat and curved surface combined, such as an oblong body with round corners.

Lecture.—The properties of Metals, specific gravity, melting points, &c.

Setting out patterns for unequal taper. Oval bodies.

Lecture.—The physical and chemical properties of Iron and Steel.

Setting out patterns for Tee pipes equal and unequal, meeting at any angle.

Bends in two or more pieces or in circular segments such as lobster back pattern.

Lecture.—The physical and chemical properties of Lead, Zinc, and Tin.

Setting out patterns for V pipes, branches, ventilating pipes and ventilators.

Setting out patterns for articles having square or oblong bases and circular or oval tops.

Lecture.—The physical and chemical properties of Aluminium, Antimony, Nickel and Silver.

Setting out patterns for compound bent surfaces such as Vases, Moulded Bases, Ornamental covers, &c.

Lecture.—Alloys.—The composition and properties of brasses, solders, hard and soft. Bronzes, &c. Theory of soldering, brazing, &c.

Setting out patterns for inclined or raking mouldings, gutters, roof work, &c.

Lecture.—Galvanising, tinning and retinning process, &c.

The setting out of patterns for Finials in copper, and zinc, and also for Lamps, Boxes, Baths, and general toilet ware. Ships ventilators, Lamps, &c.

Lecture.—Galvanising, and the manufacture of tinplate.

SENIOR CLASS.

Physical and chemical properties of metals.

Alloys.—Composition and properties.

Tin-plate, galvanised iron, lead, coated iron.

Tinning properties.

Fuel of various kinds and modes of application.

Making drawings and patterns of advanced character.

PRACTICAL.

The use and care of hand and machine tools used in Metal Plate Work.

The methods and use of cutting and bending appliances for light and heavy materials.

The methods and use of pipe bending appliances including bath beading machines, &c.

The cutting of sheet metal and flattening by (a) rolling (b) hammering, &c.

The cutting of notches and allowances for lap, wiring and making of seams of various kinds.

The methods of joining Sheet Metal by (a) Soft Soldering (b) rivetting (c) Grooving, and the use of suitable fluxes.

The methods of joining various articles by brazing, such as Tee pipes, branches, bends, spouts, piping, cylinders, &c., in iron, copper, or brass.

Annealing, stretching, raising, planishing and general principles of working up sheet copper, brass, and zinc. Iron, plain and coated; tinning and retinning of various articles.

The making of flue and ventilating pipes, branches, Y pieces and all classes of ventilators, plain and ornamental.

The making of revolving and fixed chimney cowls in copper, zinc, and galvanised iron.

The method and construction of seams and flashings used in covering roofs, domes, &c., with copper, zinc or galvanised iron.

The making of gutters, hopper heads, rain water pipes, mouldings, &c., to suit any angle.

The making up of ships lamps, ventilators, &c., in iron, copper or brass.

The making up of kitchen utensils and toilet ware, boxes, trunks, &c. The making of gas, oil and electric lamps, plain and ornamental.

CABINETMAKERS' WORK.

Instructor :
JAMES HICKS.

Junior Class.— . Tuesday, . 7.30 to 9.35.

Intermediate Class.—Wednesday, 7.30 to 9.35.

Senior Class.— . Monday, . 7.30 to 9.35.

Instruction will be given in practical work to apprentices and those engaged in the trade, and will be mainly in branches which students have not generally the opportunity of practising.

GRADE 1.

Nature and properties of the various kinds of wood used, and where obtained.

The most suitable for construction, with the best methods of seasoning and preparing for use.

Tools and their uses, with practical demonstrations as to sharpening and keeping in order.

Woodworking machinery, its advantages and economy.

Joints of various kinds—plain, cooper, and tongued, mortice and tenon, dowelled and dovetailed.

Geometry applied to cabinet making, orthographic, oblique and isometric projection.

Preparation of working drawings from pictorial sketches.

Names and descriptions of different parts of furniture and mouldings.

Methods of building up circular rims and curved panels or similar work.

Veneering, the preparation of grounds, and the appliances used.

Cabinet metal-work, hinges, and other fittings, with the best methods of fixing.

FOR ADVANCED STUDENTS.

Carcase work and chair work : methods of building up, and joints used, for both ordinary and first-class work.

Mechanical actions for desk cylinders, expanding tables, and other purposes.

Inlaying and veneering with various materials.

Working drawings and diagrams, setting-out panels and templates.

Design of furniture : principles and proportions in relation to its uses and the materials employed.

Styles of furniture : their characteristic features, and the periods to which they belong.

MOULDINGS.—Their setting out, shaping and combination. The various styles, their characteristic features, and their practical treatment.

INLAY AND VENEERS FOR CABINET WORK.—The best methods of preparing veneers, laying, routing, shading veneers, making stringing for inlays, inlaying with various materials, such as metal, ivory, bone, pearl, and tortoiseshell.

Students should attend the Class in Design and Drawing for Cabinetmakers.

EXTRA PRACTICAL CLASS.

Thursday, 7.30 to 9.35.

Course Students who are attending their Classes regularly, and Senior Students, by special permission, will be allowed to continue their practical exercises on Thursday evenings.

Miscellaneous Trades.

TAILORS' CUTTING.

Instructor :
JOHN BYRNE.

ELEMENTARY.

Junior Class— Thursday, 7.30 to 9.35.

Intermediate Class—Friday, 7.30 to 9.35.

THE PRINCIPLES OF MEASUREMENT.—Record of measurements, study of the male figure ; normal and abnormal figures. Stooping, erect, and corpulent figures. High, low, round and square shoulders. Enlarged scyes and large shoulders. Long and short necks. Prominent calves. Knock-knees. Bow-legs. The principles of scale drawing and drafting ; construction lines. Drawing of diagrams and drafting of patterns. Marking position of pockets. Block patterns ; their use and adaptation. Materials ; influence of the nature of the material on the allowances for making-up ; allowances for paddings.

TROUSERS.—The principles of trouser cutting. How to lay patterns with a view to economy, and to suit various designs of material. Trousers for normal and abnormal figures. Narrow, wide and straight legs. Riding trousers. Peg tops. Bell bottoms.

VESTS.—The principles of vest cutting. How to lay patterns with a view to economy, and to suit various designs of material. Single and double-breasted ordinary vests. Single and double-breasted dress vests, sleeved vests.

COATS.—The principles of coat cutting. How to lay patterns with a view to economy, and to suit various designs of material. Coats for normal and abnormal figures. Frock, morning, dress, lounge, Norfolk, and reefer coats.

OVERCOATS.—Frock, Chesterfield, Sac, Inverness, Ulster and Covert coats.

ADVANCED.

Senior Class—Tuesday, 7.30 to 9.35.

Materials as affecting fit and cutting. Linings most suitable for various materials and styles. Trimming ; materials and quantities required. Trying on ; how to prepare the garment ;

the process of fitting on. Making up, shaping, staying, putting in pockets, sleeves. Making collars. Examination of finished garments. Alterations.

TROUSERS.—Military and naval.

BREECHES.—Livery, riding, dress, cycling, and clerical breeches. Knickerbockers and knicker-breeches. Pantaloon.

GAITERS AND LEGGINGS.—Spats, riding leggings, livery and clerical gaiters.

VESTS.—Military and naval vests, clerical vests, cassock vests, dress vest and livery vest.

COATS.—Military and naval coats, tunic, patrol, full dress, undress, monkey, mess and frock coats. Clerical coats. Frock and dress coats. Double and single-breasted cassocks. Hunting and livery coats.

OVERCOATS.—Military, naval, and livery overcoats.

LADIES' GARMENTS.—Ladies' costume skirts; close and loose-fitting jackets.

Students must provide themselves with a tape measure and pipeclay, and will be expected to take notes and make sketches at each of the lessons.

HAIRDRESSERS' WORK.

Instructors:

JOSEPH ADDISON.

JAMES LACY.

ELEMENTARY.

Junior—Monday, 8.35 to 10.5.

Preparation of combings; methods of separating roots from points; weaving; making of frizzettes; preparation and mixing of hair; utilising long and short combings; making of tails, switches. Brushing and combing ladies' hair; ladies' hair, cutting and singeing; curling and plain hairdressing.

Lectures and demonstrations on how to finish work.

ADVANCED.

Intermediate—Wednesday, 8.35 to 10.5.

Senior—Wednesday, 8.35 to 10.5.

Making of puffs and marteaux curls; knotting pin curls; foundation for fringes, transformations, scalps, wigs; different foundations and nets for same; springs; water weaving; fringe and transformation dressing; marcel weaving; modern and historic dressing.

Lectures and demonstrations on various styles of hairdressing.

BOOT AND SHOE MANUFACTURE.

Instructor :

EDWARD LEONARD.**Junior Class— Tuesday, 7.30 to 9.35.****Intermediate Class—Thursday, 7.30 to 9.35.****Senior Class— Monday, 7.30 to 9.35.**

The aim of this class is to give a knowledge of the various branches of the trade to apprentices and improvers, who, owing to the increased use of machinery, are usually confined to one of the many branches of the Boot Trade.

Several machines are being added to the equipment.

Instruction will be given in the following subjects :—

Determination of simple areas, as of skins ; definition of terms ; the action of water upon leather ; metric system of measurement ; differences between the bones of the infant and adult ; how muscles act, effect of friction and pressure ; the formation of the foot and leg, with their characteristics and functions ; methods of obtaining the shape and dimensions of the foot and leg ; measuring apparatus ; methods of recording measurements ; fitting up lasts for bespoke. Pattern-cutting—standards ; men and boys' ; ladies' and girls' ; drafting standard pattern ; grading patterns into sets ; cutting patterns into working sets. Clicking ; selection and description of various hides and skins and their adaptability ; economy in cutting up skins for men's and ladies' boots ; upper fitting. Closing ; action of parts of simple machines for uppers ; rough stuff cutting ; the hide and its divisions ; cutting and sorting bottom stuff ; lasting ; hand-lasting for machine-sewn work ; machine-lasting for machine-sewn work, with reference to various machines used ; methods of attaching soles to uppers ; boots for malformed feet. Finishing ; hand-finishing ; description of tools ; machine-finishing ; acids, stains, colouring substances, dyes, and paints used in finishing boots and shoes ; hand-sewn method ; preparing insole ; welt and lasting ; attaching welt and sole ; raw materials ; tanning.

MANUAL INSTRUCTION (Woodwork).

Teacher :

T. W. THORNTON.**Wednesday—Junior, 7.30 to 9.35.****Monday— Senior, 7.30 to 9.35.**

The object of the instruction is to train the hand and eye by accurate measurement and by the use of tools, and to impart a knowledge of the principles of simple construction.

TIMBER.—Its nature, growth, and description, qualities, seasoning, uses. Countries and ports from which we receive our supplies, the forms in which it is brought into the market. Description of the more common kinds of woods, and the purposes for which they are best adapted.

TOOLS.—Their names, proper uses, correct handling, principles of construction, and the modes of hardening sharpening and using them; the varieties and uses of the various accessories required in construction, such as nails, screws, glue.

EXERCISES IN JOINT WORK.—Housing joint, cross-halving joint, **T**-halving joint, notched **T**-joint, notched cross joint, mortice and tenon joint, bridle joint, tongue and groove joint. Cogging joint, mortice bridle joint, oblique halving joints. Tredgold's notched halving joints. Common box dovetailing.

MODELS.—Bench hook, pen-tray, flower-pot stand, flat ruler, flower stick, key label, string winder, round ruler, flower-pot cross, nailed box, finger plate, bracket, set squares, **T**-square, try square, towel roller and rests, drawing board, soap-box, scoop mirror frame, knife-box, organ-pipe and other examples.

MANUAL INSTRUCTION (Metalwork).

Teacher :

Friday, 7.30 to 9.35.

A Class will be formed for this subject if sufficient students apply.

Art School.

This School includes the subjoined departments under the general supervision of the

ART MASTER—WILLIAM L. WHELAN, HEAD OF THE ART SCHOOL.

FREEHAND DRAWING.

MODEL DRAWING.

MEMORY DRAWING.

GEOMETRICAL DRAWING.

LIGHT AND SHADE DRAWING.

PLANT AND MEMORY DRAWING.

BRUSHWORK AND PAINTING OF ORNAMENT.

DESIGN.

DESIGN APPLIED TO CRAFTS.

MODELLING.

STONE AND MARBLE CARVING.

WOOD CARVING.

ENAMELLING ON METAL.

DECORATIVE AND ORNAMENTAL IRON WORK.

ART AND ARTISTIC CRAFTS.

The instruction in Art will comprise a thorough and practical knowledge of Drawing, Design and Modelling, more especially in their applications to Industry and Trade. It is also intended for those who desire to make Art their profession or a part of their general education.

The School is equipped with a varied collection of plaster casts, antique and modern figures, busts, architectural ornaments, examples of ornament of all periods, diagrams, photographs and books, which are available for study and reference.

Students of the Design Class who can produce suitable designs on paper, in clay, or other medium, will have every opportunity of working out their own designs in the woodcarving, metal-work, enamelling, or other craft classes. Designs for gesso-work, leather-work, stencil-making, or other handicraft requiring no special apparatus, may be carried out in the class.

The Art Department is located in No. 14 of the Lower Kevin Street Schools, save for Modelling in Clay, which is conducted in No. 2, and Art Ironwork in No. 6.

The Staff consists of:—

Art Master and Head	..	..	W. L. Whelan.
Assistant Teacher	..	..	W. Millard.
Assistant Teacher	..	..	J. J. Burke.
Teacher of Modelling	..	..	T. J. Mathers.
Ironwork Instructor	..	..	H. Taylor.

* The three first-named Teachers of Art are responsible for instruction in the following subjects.

FREEHAND DRAWING.

Thursday, 7.30 to 9.35.

Friday, 7.30 to 9.35.

Materials and aim of Study.—Methods of using pencil, pen, charcoal, and brush. Their suitability to express form in line or mass.

Blackboard demonstrations to show methods of construction, structural planning, guide, leading and controlling lines; proportion of masses, spaces, boundaries and details.

Drawing from large diagrams of construction of ornamental floral, foliated and animal forms, carefully selected and graduated to train the hand and lead the eye to appreciate beauty of form and proportion. The principles of ornament.

Free-arm drawing on paper and blackboard.

Exercises to test the students' ability to apply the principles which have been already taught.

Exercises in the representation of form with flat washes of colour.

Direct drawing in silhouette.

Drawing from casts of simple ornament and simple sprays of natural foliage in high and low relief. Drawing from shells, butterflies and birds.

Drawing from photographs of simple sprays of natural foliage, flowers and fruit.

Drawing from photographs, casts and large diagrams, of typical examples of historic styles, patterns, and schemes of decoration, including heraldry and lettering in use at different periods, furniture, utensils, costume, armour, &c. Typical ornamental treatments of borders, medallions, panels, friezes, and pilasters.

Provision to be made during the lessons for practice in time-drawing.

Simple memory drawing.

MODEL DRAWING, DRAWING OF COMMON OBJECTS. MEMORY DRAWING.

Wednesday, 7.30 to 9.35.

Experiments to show by actual observation the effect of perspective in modifying the appearance of objects. The position of points, meaning and illustration of vanishing. The laws governing the appearance of objects, and how they should be drawn.

Drawing the circle in different positions, at the eye level, above and below the eye level. Application to the drawing of familiar objects of circular section, such as cylinders, jars, and cans.

The drawing of regular solids, with application to common objects: the Cube, rectangular Prism, triangular Prism, hexagonal Prism, Cone and Pyramid.

The Ring and its applications.

Drawing models and objects singly and in groups.

Drawing articles of common use, embodying the principles already taught: jugs, cans, chairs, tables, cupboards, presses, candlesticks, lamps, tools, clocks and articles of furniture.

Concurrently with above lessons time-sketching.

Memory Drawing and exercises.

MECHANICAL DRAWING AND GEOMETRICAL DESIGN.

Tuesday, 7.30 to 9.35.

Drawing Instruments, and Materials. General directions. Simple exercises in the use of Tee Squares, set squares, and compasses.

Geometrical definitions. Lines, Proportional division of a line.

Triangles, Quadrilaterals. Simple pattern-drawing.

General information concerning Polygons. General methods for constructing Polygons from given data.

Lines and Circles. Convergent lines, Touching Circles.

Scales. Construction of Plain Scales. Diagonal Scales and Proportional Scales. Scale of Chords.

Inscribed and Described Figures.

Tangents and Tangential Arcs.

Construction of Similar Figures.

Foiled Figures.

Conic Sections.—The Ellipse, its tangents and normals. Mechanical methods for drawing the Ellipse. The Parabola, Hyperbola, and Cycloidal Curves.

Orthographic Projection, Points, Lines and Planes.

Plans and Elevations of Solids in simple positions.

Plans and Elevations of geometrical solids and simple objects, singly or in combination.

Construction of Sectional Areas.

Construction Lines on which Patterns are based.

Units of Pattern, Diaper, Chequer, Spot and Powder.

Geometric spacing of Walls and other Surfaces.

Bands and Borders. Arch Forms. Tracery.

Greek and Roman Mouldings. Gothic Mouldings and Piers.

In addition to the above, exercises will be set, and reference will continually be made to the application of Geometry to the different branches of Industrial Art.

DRAWING IN LIGHT AND SHADE, FROM CASTS, MODELS, COMMON OBJECTS, AND NATURAL FORMS.

Lecturer :

Monday—Junior, 7.30 to 9.35.

Wednesday—Senior, 7.30 to 9.35.

Materials and how to use them. Simple exercises in rendering flat tones. Graded and flat tones by means of chalk, pencil, pen, and brush.

Meaning of terms: Light, Half tone, Shade, Cast-shadow, and their modifications.

Plane surfaces and surfaces inclined to the source of light. The Cube, Prism, and Box.

Shadows from straight lines and simple surfaces on plane and curved surfaces.

Curved Surfaces: The Cylinder, Cone, and Sphere. Exercises on above to show the effect of different backgrounds.

Rings with concave and convex sections.

Vase forms. The distribution of light and shade on vase forms.

Exercises in rendering geometric solids.

Relief ornament on flat grounds and on curved surfaces.

More advanced exercises from the Cast, and from groups of objects.

Application of the principles of Light and Shade to the drawing of architectural and natural forms. Details from the Antique. Drawing in Light and Shade from Memory, and time drawings.

PLANT DRAWING. MEMORY DRAWING OF PLANT FORM. PLANT FORM IN DESIGN.

Wednesday, 7.30 to 9.35.

Exercises to illustrate treatment. Difference between pictorial and decorative treatment. Colouring and drawing.

The structural point of view and its bearing upon design.

Plants used in ornament: the Lotus, Acanthus, Vine, and Honeysuckle.

Essential characteristics for preserving the identity of the plant.

Conventional and Naturalistic treatments. Stems—erect, climbing, twisting, &c. Branches and leaf arrangements. Stages of development: stipules, bracts, and other small details. Leaves: simple and compound. Flowers: The Calyx, Corolla, and Stamens. Fruits: seed vessels, seeds, winged seeds. Roots and Bulbs.

Concurrently with above, drawings in pencil, chalk, pen or brush, such plants as the following:—

The Buttercup.	The Primrose.
The Convolvulus.	The Cranesbill.
The Dahlia.	The Daffodil.
The Harebell.	The Iris.
The Bay.	The Laurel.
The Arbutus.	The Artichoke.
The Oleander.	The Wild Rose.
The Oak.	The Ivy.
The Poppy.	The Field Daisy.
The Holly.	

These exercises to give a simple analysis, from an artistic rather than a botanical point of view, of the chief structural characteristics. Sketches to indicate the general character and growth of the plant, the various shapes which a leaf takes in its growth, the arrangement of the leaves on the stem, the plan and profile of a flower, the arrangement of its petals, the form of its Calyx, of its Pistil and of its Stamens.

BRUSHWORK AND PAINTING ORNAMENT.

Monday, 7.30 to 9.35.

Brush forms resulting from single brush-impressions. Combined brush marks.

Brush marks of different tones. The rendering of ornamental forms by means of brush strokes.

Drawing with the brush in silhouette, simple architectural and natural forms, leaves, and flowers.

Direct expression of plant and animal life by means of brushwork.

The mixing and harmonious juxtaposition of colour and the preparation of various grounds.

Painting ornament in oil and tempera from the Cast, from photographs, and from examples of Decorative Painting to be found on vases or tiles. Copying from stained glass and other examples of Historic Art. The importance and influence of the situation and surroundings on the painting of ornament.

INDUSTRIAL DESIGN.

ELEMENTARY.

Thursday, 7.30 to 9.35.

Materials used in designing, paper, tinted grounds, blackboard, chalk, charcoal, colours, stains and inks.

Methods of Work.—Transferring, Pouncing, Stencilling, Bi-ateral and Radial patterns, Working drawings.

Methods of delineation, Outline, Surface, Massing or Spacing, Relief, Modelling and Carving

Elements of Ornament. Geometry as the basis of ornament. Geometric design, Floral and natural forms, their adaptation to decoration.

Designing to fill given spaces, Square, Triangle, Border, Spandril, Lunette, Pilaster, Panel. The designs may consist of :—Ornament composed of straight lines only; Geometric Ornament; Interlacing ornament, Scroll-work, and Foliated or Floral ornament.

Surface design and repeating patterns, composed of straight lines, geometric, interlacing, scroll-work, and floral ornament. Diapers and "All-over" patterns. "Drop," "Sprig," and "Trellis" patterns.

ADVANCED.

Friday, 7.30 to 9.35.

Designing Borders, Panels, and Diapers in given historic styles : Greek, Roman, Celtic, Early Gothic (13th Century), Renaissance, and Moresque manners.

Designs for Panels, Capitals, Pilasters, Friezes, Borders, Spandrils, and Book-covers in which some well known plant is taken as the *motif*.

Designs adapted to some specific purpose and to some specific mode of execution, such as the various simple processes of workmanship, Stencilling, Colour-printing, Inlaying, Carving, Modelling, Casting, and Leather-work.

Exercises in making designs for some particular object, such as a Ceiling, a Capital, Frieze, Casket or a Panel, in relief or in the round.

Concurrently with above work, the study of Historic Ornament illustrating conventional treatment and the expedients by which the Mediaeval or oriental workman modified natural form to suit his ideas of Ornament.

ADVANCED DESIGN APPLIED TO CRAFTS.**(For Senior Students).****Thursday, 7.30 to 9.35.**

Advanced designs, designs adapted to special processes of execution: Wood carving, Goldsmiths' work, Process printing, Enamelling, Embossing, Casting and Ironwork.

Designs for schemes of decoration with some important feature carried out to full size, or to as large a scale as the limits will allow.

Designs for important Compositions to full size or to a large scale, with sketches to show the position the design is meant to occupy.

THE PRINCIPLES OF ORNAMENT AND DESIGN: HISTORIC DEVELOPMENT OF STYLES.**Thursday, 7.30 to 9.35.**

Lectures for Craftsmen and Students of Design. The use of form and colour for decorative purposes in various periods.

Architectural elements, general proportions of architectural forms

Principles and elements of Ornament.

Structure and growth of Plants, Trees and Shells.

Analysis of form and design. Characteristics in typical ornaments, metal-work, Bronzes, Porcelain, Costume, Textiles and Embroideries.

Ornament: ancient, mediaeval, and modern.

The temples of Karnak and Thebes. Greek and Roman monuments. Assyrian bas-reliefs. Pompeian decorations. Ornamented Metal utensils, Furniture, Lamps, and other objects.

Styles of ornamental and decorative work by artists such as Ghiberti, Donatello, Michael Angelo, Raphael, Benvenuto Cellini, Bernard Palissy, Adam, the brothers Sheraton, Chippendale, Wedgwood, Owen Jones and Alfred Stevens.

THE PRINCIPLES OF ORNAMENT, AND THE HISTORIC DEVELOPMENT OF STYLES.

Thursday, 8.35 to 9.35.

Seven Lectures on the following subjects will be given by the Art Master, Mr. W. L. Whelan, on Thursday evenings, 8.35 to 9.35, the dates of which will be posted on the door of the Art Room.

The principles underlying all designs ; the use of form and colour.

The general proportions of Architectural form and examples of Ornament.

The structure and growth of plants, trees and shells.

The lines of growth and motion in animals, birds, ships and waves.

Analysis of form and design.

Characteristics in typical ornaments, costume, textiles, bronzes, metal-work, furniture, porcelain and monuments.

Ornaments—Ancient, Mediaeval, and Modern.

These lectures, whilst primarily intended for students who are taking up the study of design and for those engaged in the various handicrafts, are open to other students.

MODELLING.

Instructor :

THOMAS J. MATHERS.

Junior—Monday, 7.30 to 9.35.

Senior—Wednesday, 7.30 to 9.35.

A graduated course of instruction in Clay Modelling.

The application of Modelling to Industrial Design.

Instruction will be given in the modelling of styles of architectural and decorative ornament. Marble, stone and wood carvers, plasterers, architects, designers, and decorators will have opportunities of acquiring a practical knowledge of relief ornament, applicable to the particular work in which they may be engaged.

Modelling ornament from casts of simple forms and from photographs of architectural details. Modelling flowers, fruit and foliage, from nature, and adapting natural forms for architectural and decorative purposes.

Making of models in plasticine, clay, and wax for reproduction in bronze, silver, and gold.

Designing and modelling for reproduction in solid and fibrous plaster for ceilings, cornices, friezes, enriched mouldings, capitals, and wall decoration.

Modelling from Casts of Ornament, or animal forms.

Modelling from natural forms and drapery. Masks and heads : human figures or parts from casts.

The mechanical process employed in casting and the making of moulds. The casting of Models.

During the Session lectures and demonstrations will be given on the application of designs to various materials, according to the technical wants of the individual students. For advanced students, instruction in the History of Sculpture.

STONE AND MARBLE CARVING.

Instructor :
THOMAS J. MATHERS.

Friday, 7.30 to 9.35.

A knowledge of drawing and modelling being essential to those who wish to benefit by the teaching, students will be required to give some time each week to attain this.

The nature of the material. The tools used in carving. The decorative treatment of stone and marble ; mouldings and enrichments ; ornament. Methods of pointing. Processes of reproduction in stone or marble from plaster models. Monumental work. Architectural work.

WOOD CARVING.

Instructor :

JOHN MILLIGAN.

Junior—	Thursday, 7.30 to 9.35.
Intermediate—	Tuesday, 7.30 to 9.35.
Senior—	Monday, 7.30 to 9.35.
Special—	Wednesday, 7.30 to 9.35.

Students are not eligible for the classes in wood carving unless they are able to satisfy the Art-master of their competence in freehand drawing or modelling; and in the absence of this, must take up classes in these subjects along with the course in wood carving. A knowledge of freehand drawing and modelling is indispensable to success in wood carving.

The instruction will be of a progressive nature.

JUNIOR.

The use and names of tools used in Wood Carving.

The sharpening of tools. Stones employed.

The various woods made use of. Treatment of the different classes of wood: the influence and effect of grain.

Setting out and starting a piece of work. The methods adopted.

First stage in the working of a pattern.

Second stage in the working of a pattern. Modelling the work.

Finishing the work.

Simple patterns of carving with one or two tools.

Ornamental forms in soft and hard timber.

Carving in flat and broad treatment in yellow pine.

Carving in hard timber and how to treat same.

Simple panels from casts.

Conventional foliage in different styles from cast.

Natural forms of foliage. How to treat practically in wood.

Geometrical patterns and freehand ornament contrasted in their application to Furniture and Architectural work.

INTERMEDIATE.

Carvings of the Renaissance "Italian" period.

Carvings in the French Renaissance style.

Gothic Carvings.

Carvings in different styles applied to architectural and interior decoration.

SENIOR.

The work of the Italian Renaissance explained and examples given.

The French Renaissance explained.

Natural foliage and Geometrical treatment.

The Gothic periods. Norman.

Early English period.

Decorated period.

Perpendicular Styles.

Examples of Architectural treatment.

Carvings as applied to furniture.

Individuality of style explained and examples given.

Course Students who attend all their Classes regularly, and Senior Students, by special permission, may continue their practical work on Wednesday evenings.

ENAMELLING ON METAL.

Instructor :
WILLIAM L. WHELAN.

Friday, 7.30 to 9.35.

Enamel—Its nature and qualities. The practical application of enamel. Metals to which it is applied.

Methods of enamelling—Cloisonné. Plique à Jour. Champlevé. Baisse Taille. Painted or Limoges.

The selection and treatment of the enamels employed. Firing and finishing.

Students attending the class will design the work they are to carry out, and arrangements will be made to enable them to study design and prepare the necessary drawings.

DECORATIVE AND ORNAMENTAL IRONWORK.

Instructor :
H. TAYLOR.

Tuesday, 7.30 to 9.35.

Thursday, 7.30 to 9.35.

The class is intended for those who have some practical knowledge of general smiths' work, but who are desirous of practising the more decorative sections of their trade.

ELEMENTARY.

Iron, its nature and properties.

The various kinds of iron used in trade by art-iron workers.

Tools, their various applications and uses.

The treatment and manipulation of wrought-iron : Forging, Welding, Jumping, Bending, and Embossing.

Methods of joining iron-work. Details used in art-smithing.

Riveting, Intersecting, Tenoning, Shrinking on Collars.

Twisting.—Spindle-shaped spiral twists. Scrolls. Volutes.

Slitting.

ADVANCED.

Interlacings. Plaiting. Hammering.

Scrolling bars into volutes to a given scale.

Beating scroll ends into forged or embossed leaves.

The construction of husks, flowers, rosettes, leaves and sprays, garlands and festoons. Cartouches and Shields.

The making of panels, grilles, balustrades, gates, hinges, hanging-signs, brackets, chandeliers, electroliers, lanterns, stands, and other objects in iron.

Special attention will be given to the treatment of metal work for use in electric light, gas and lamp fittings.

Printing.

MUNICIPAL SCHOOL OF PRINTING, BOLTON STREET.

EVENING CLASSES.

TYPOGRAPHY, PRACTICAL :

Compositors' Work	..	First Year.
" "	..	Second Year.
" "	..	Third Year.

Press and Machine Work	..	First Year.
" " "	..	Second Year.
" " "	..	Third Year.

Linotype Work	..	Elementary.
" "	..	Advanced.

Classes in Technical Arithmetic.
 Classes in English.
 Classes in Drawing.

LITHOGRAPHY.—Drawing Class.

AFTERNOON CLASSES.

TYPOGRAPHY, PRACTICAL :

Classes in Technical Arithmetic.
 Classes in English.
 Classes in Drawing.

TYPOGRAPHY, THEORETICAL.

Chief Lecturer :

COMPOSING—FIRST YEAR.**Monday, 8.0. to 9.0.**

In addition to Practical Demonstrations the Junior Students will be instructed in the following matters :—

Spelling ; Punctuation ; and Grammatical Construction. Type : dimensions and proportions of body and face. Various faces and founts. Characters in a fount. Lays of the Case. Type metal. Implements in use, and how to use them. Distribution and composing. Spacing and justifying. The Linotype Machine. The Monotype.

COMPOSING—SECOND YEAR.**Thursday, 8.0. to 9.0.**

The subject matters of the Junior Class dealt with more fully. The Point system. Its features and advantages. The composition of Type Metal, of Stereo and Lino Metal. Bookwork ; casting off MSS.—the treatment of preliminary matter and notes. Measures for book-work. Margin. Methods of imposition. Proof correction. The reading of proofs ; correction marks. Display work. The use of ornament. Borders, ornaments, and rules. Tint blocks. Combinations of type. Tabular work : details and precautions. The setting of headings. Display work. The principles and methods involved.

PRESS AND MACHINE WORK—FIRST YEAR.**Tuesday, 8.0. to 9.0.**

The Junior Machine Students will receive instruction in the following matters :—

PAPER.—Its nature and sources. Methods of manufacture. Standard sizes. Folding and cutting. Qualities : treatment for special purposes.

INK.—Nature and composition. Properties and treatment in use. Methods of Manufacture. Black and coloured inks. The inking table.

Simple schemes of imposition. Chases and furniture. Locking-up formes. The common appliances of the Printing Shop.

ROLLERS.—Their composition and treatment. The Albion Press. Platen Machines. Cylinder Machines.

TYPOGRAPHY, PRACTICAL.

Instructors :

COMPOSITORS' WORK—FIRST YEAR.**Practical— Monday, 9.5 to 10.5.****Additional—Tuesday, 8.0 to 10.5.**

The lay of the Case. Preliminary exercises in the setting-up of type according to the most approved methods, special attention being paid to style. Spacing and justifying. The division of words. Insetting.

The use of leads and rules. Cutting to standard sizes.

The handling of type when set up. Locking up. The distribution of type. The pulling of proofs. Proof correction : reader's marks : manipulation. The treatment of ink.

Display work : Simple examples.

COMPOSITORS' WORK—Second Year.**Practical —Thursday, 9.5 to 10.5.****Additional—Wednesday, 8.0 to 10.5.**

Setting-up from difficult MSS. Correcting to worked proofs. Display work. The use and manipulation of borders, ornaments and rules. Construction of type. Attention to fundamental principles. The use of colour.

Pamphlet work : suitable measures : margin : schemes of imposition.

Tabular work : simple examples and exercises.

COMPOSITORS' WORK—THIRD YEAR.**Practical— Wednesday, 8.0 to 10.5.****Additional—Thursday, 8.0 to 10.5.**

In this class the students will take up more difficult tasks, and will be encouraged to turn out individual work of an artistic nature.

In all the above cases, the additional night is offered free to those only who are taking Courses, and are attending regularly all the Classes of their Courses. Others are required to pay an additional fee for the additional night, if they make use of it.

TYPOGRAPHY, PRACTICAL.

Instructor :

PRESS AND MACHINE WORK—FIRST YEAR.

Tuesday, 9.5 to 10.5.

Additional—Wednesday, 8.0 to 10.5.

In this class students will be taken through graduated exercises, and will be familiarised with the manipulation of Ink and of Paper ; with the pulling of proofs, and with the single Presses. In particular they will have practice with the Hand and with the Phoenix Platen Press, and gain some experience of the Miehle Machine.

PRESS AND MACHINE WORK—SECOND YEAR.

General— Thursday, 8.0 to 10.5.

Additional—Wednesday, 8.0 to 10.5.

In this class the students will carry out work on a Quad Crown Miehle Machine. Particular attention will be paid to "making-ready" and to "register." Simple exercises in colour printing and in the turning-out of artistic samples of Display work.

PRESS AND MACHINE WORK—THIRD YEAR.

General— Wednesday, 8.0 to 10.5.

Additional—Thursday, 8.0 to 10.5.

Special work of an advanced nature, carried out by the students themselves.

See Note at foot of preceding page for meaning of "additional" night.

LINOTYPE MACHINE WORK.

Instructor :

R. A. LATCHFORD,**Junior Demonstration—Tuesday, .. 8.0 to 10.5.****Senior Demonstration—Thursday, .. 8.0 to 10.5.****Junior Practice— Monday, .. 8.0 to 10.5.****Senior Practice— Wednesday, 8.0 to 10.5.**

In these classes students will be taken in small groups for individual instruction in the use, manipulation, management, and adjustment of the Machine. On Monday nights lectures and demonstrations will be given to the Junior students ; and on Friday nights to the Senior students.

MONOTYPE.

It is hoped that instruction in Monotype work will soon be added.

TECHNICAL CALCULATIONS AND WORKSHOP MATHEMATICS.

Lecturer :

MICHAEL HANLY.**First Year— Thursday, 8.0 to 9.0.****Second Year—Tuesday, 8.0 to 9.0.****Third Year— Monday, 8.0 to 9.0.**

In these classes a graduated course of instruction will be given in Arithmetical Calculations, with special regard to the needs of Printers. A little elementary Algebra will be introduced in the Second Year.

FIRST YEAR.

ARITHMETIC.—Measures and Multiples ; fractions (vulgar and decimal) ; simple and compound proportion by unitary method ; simple interest ; averages and percentages ; the metric system ; technical calculations.

GEOMETRY AND MENSURATION.—Simple geometrical ideas ; use of protractors and compasses ; areas of triangles and rectangles ; areas of other figures and cubic capacities.

SECOND YEAR.

ARITHMETIC.—Contracted multiplication and division of decimals ; square and cube root ; variation and rate of gain or loss ; simple and compound interest ; Metric and British systems of units ; technical calculations.

GEOMETRY AND MENSURATION.—Simple, practical geometry ; mensuration of plane figures and of the circle ; volumes and surfaces of Cylinder and Cone. Specific gravity.

ALGEBRA.—Simple rules and exercises.

THIRD YEAR.

Further developments of the foregoing, for more advanced Students.

ENGLISH.

Lecturer :

MICHAEL HANLY.**First Year— Thursday, 9.5 to 10.5.****Second Year—Tuesday, 9.5 to 10.5.****Third Year— Monday, 9.5 to 10.5.**

In these classes will be given a graduated course of instruction in English.

FIRST YEAR.

Spelling. Punctuation. Grammatical construction. The formation and nature of phrase, clause, and sentence. The parts of speech. Moods and tenses. The sequence of tenses. Prefixes and affixes: their use and meaning.

GRAMMAR.—The uses and inflections of the parts of speech; parts of a simple sentence; the subordinate sentence and its functions; analysis of sentences; correction of grammatical errors.

COMPOSITION AND SPELLING.—Letters and essays on given subjects; paraphrasing; summarising; dictation of passages previously prepared by Students.

Students will be required to read aloud in class from a selected reader, with a view to extending their vocabulary, and improving their methods of speaking.

SECOND YEAR.

GRAMMAR.—The construction of sentences; the connection of sentences and sequence of tenses; correction of faulty sentences; prefixes and affixes; their use and meaning; syntax.

COMPOSITION AND SPELLING.—The writing of letters and reports. Essays on given subjects; paraphrasing, summarising; dictation of passages previously prepared by Students. Students will be required to read aloud in class from standard authors.

THIRD YEAR.

More advanced instruction in the foregoing English Literature. Study of standard authors.

TECHNICAL DRAWING.

Instructor:

C. E. LODGE.

Elementary—Wednesday and Friday, 9.5 to 10.5.

Advanced— Wednesday and Friday, 8.0 to 9.0.

A graduated course of instruction is offered in Drawing at the above times. The exercises will be such as to lead practical Printers up to the kind of designing work which will be useful to them in their business. Each Student attends on one night only.

AFTERNOON CLASSES.**TYPOGRAPHY.**

Lecturer .

The afternoon classes are intended for newspaper hands, and will not be held unless there be a sufficient number of applicants.

COMPOSITORS' WORK—ELEMENTARY.

Monday, 4.0 to 6.0.

The instruction will be of a practical nature, but a portion of the time will be occupied by a general demonstration to the Students. For subject matter see page , First Year.

COMPOSITORS' WORK—ADVANCED.

Monday, 4.0 to 6.0.

For subject matter of demonstration and work, see page .

LINOTYPE.

Instructor ;

R. A. LATCHFORD.

Monday, 4.0 to 6.0.

Practical instruction in the use of the Linotype Machine.

**TECHNICAL CALCULATIONS AND
WORKSHOP ARITHMETIC.**

Lecturer :

MICHAEL HANLY.

Wednesday, 5.0 to 6.0.

Students will be shown how to make the calculations that are needed in their Trade, and will work out exercises under the direction of the teacher.

ENGLISH.

Lecturer :

MICHAEL HANLY.

Wednesday, 4.0 to 5.0.

For subject matter see page .

TECHNICAL DRAWING.

Instructor :

C. E. LODGE.

Wednesday, 5.0 to 6.0.

Exercises of a practical nature, such as should be serviceable to Compositors, will be done under the guidance and instruction of the Teacher.

Commercial Subjects.

HEAD OF DEPARTMENT AND PRINCIPAL—

MARTIN R. WHEELER, M.A.

IRISH.

FRENCH.

GERMAN.

COMMERCIAL ENGLISH.

COMMERCIAL ARITHMETIC.

COMMERCIAL GEOGRAPHY.

BOOK-KEEPING.

ACCOUNTANCY.

SHORTHAND.

BUSINESS METHODS.

TYPEWRITING.]

COMMERCE.

In the Commercial School, Students will be given every facility and encouragement to follow the Courses of Study laid down by the Department. The final Diploma should be of great value to them in after life, apart even from the useful training involved. All are strongly advised to make themselves acquainted with the new Scheme of the Department at the outset, and to consult Mr. Wheeler, the Principal of the School, as to their course of study in preparation for these Examinations.

IRISH.

Teacher :
DENIS LYNCH.

Junior Class—Friday, 7.30 to 9.35.

Senior Class—Wednesday, 7.30 to 9.35.

These classes are divided into Junior and Senior, and are intended for those who desire to acquire a useful knowledge of the language, more especially with a view to occupying positions in districts where such knowledge is essential. The instruction will include pronunciation, reading, grammar, translation, composition, commercial, and technical terms.

JUNIOR.

In addition to the progressive lessons on every night there will be direct conversation, exercises or reading from a standard Author officially appointed.

Names of objects in the room.

Use of the Article.

Verb "ṛo beic̃." Formation of short sentences.

The verb "ṛo beic̃." Present and past tenses with the preposition "aṣ̃."

The negative and interrogative forms, the future tense.

The verb "ṛ̃." Formation of sentences. Difference between the verbs "ṛ̃" and "ṛ̃ã".

The verb "ṛ̃" with the preposition "te" denoting ownership.

The verb "ṛ̃" with the Adjective.

The verb "ṡo ṡeic̄" with the preposition "ar̄".

Aspiration of nouns.

The Indicative Mood.

Familiar Regular Verbs.

Eclipsis of Nouns. Exercises and Conversation.

Numerals. Lesson on the clock.

More familiar forms of Regular and Irregular Verbs.

Exercises in Composition.

SENIOR.

In addition to the progressive lessons, there will be on every evening direct Conversation, exercises or reading from an officially appointed standard Author.

Verbs "ṡo ṡeic̄" and "ir̄." Idiomatic uses with Prepositions

The Regular Verb with particles.

The Irish prepositions. A story in Irish.

The Compound Prepositions.

Original Compositions.

Special Constructions.

Comparison of Adjectives.

Cardinal Points (Map of Ireland).

Numerals, time of day, dates, numeration, space and distance.

Idiomatic constructions, and expressions.

Declension of Nouns and Adjectives.

Irregular Nouns.

The Second conjugation.

The Autonomous Verbs.

The verb "must" "ought," &c. Irish equivalents.

The subjunctive mood and certain Irregular Verbs.

Exercises on the Irregular Verbs.

Difficult exercises in composition, and in translation.

FRENCH.

The method chiefly followed in teaching is that known as the direct or new method, which has been introduced from the continent.

The aim is to give the learner a ready command over the sounds, words and phrases of the language. To secure this result use is made of object and picture lessons, which proceed on definite lines and where subject-matter may be mastered by adequate repetition.

JUNIOR.

Monday, 7.30 to 9.35.—Class A.
Tuesday, 7.30 to 9.35.—Class B.
Friday, 4.0 to 6.5.—Class C.

Teachers ;
MICHAEL HAYES.
DENIS LYNCH.
DENIS LYNCH.

The instruction will comprise pronunciation, reading, and translation into English, Elementary Grammar, exercises, and conversation on familiar subjects.

In addition to the following subject matter, on most class nights, there will be direct Conversation, exercises, or readings from a standard Author specially appointed.

Names of familiar objects. The Definite Article.

The Noun and Adjective.

Masculine and Feminine Nouns, singular and plural, with Definite and Indefinite Articles.

The Partitive Particles with Definite Article. The verb "*Avoir*" for conversation.

Familiar Regular Verbs in the Indicative Mood.

Certain Irregular Verbs in the Indicative Mood.

Comparison of Adjectives. Illustration from chart. Verb *Etre*.

Numerals Hour of day, age, cardinal and ordinal numbers.

Verbs *Avoir* and *Etre*. Questions and answers.

Pronouns with nouns. Regular verbs in the Past Tense

Familiar Irregular Verbs in the Indicative mood.

Certain familiar Irregular Verbs in the Present Perfect. Author, question and answer.

Written composition and answer.

Idiomatic uses of *Avoir* and *Faire*.

Relative and Demonstrative Pronouns.

Regular Verbs, future tense.

Use of the Prepositions and of the Adverb

Composition and Translation

INTERMEDIATE.

Teacher ;

Thursday, 7.30 to 9.35.

DENIS LYNCH.

The instruction will aim at progressive development of the foregoing, and special attention will be given to conversational exercise,

In this class the study of Grammar will be followed up, particular attention being paid to the use of the Subjunctive Mood and to the Irregular Verbs.

Exercises will be undertaken in the following :—

The Various Tenses of the Regular Verbs.

The Subjunctive and Imperative Moods.

The Negative and Interrogative forms.

Auxiliary Verbs.

The use of Particles.

Various parts of speech.

Intransitive Verbs.

Reflexive Verbs.

The Irregular Verbs.

Concurrently with the foregoing, direct conversations will be held illustrative of the work in hand.

Exercises in composition, involving the use of the Subjunctive Mood.

Translation: French to English: English to French. Commercial terms will be studied and Commercial Letters written. A Standard Author, officially appointed, will be constantly used and studied.

SENIOR.

Teacher ;

Monday, 7.30 to 9.35.

DENIS LYNCH.

The instruction will comprise more difficult exercises in grammar and translation, conversation on commercial subjects ; the terms used in commerce and industry, banking operations, railways, steam boats, shipping, manufactures, exhibits, market reports, circulars ; commercial letter-writing.

In addition to the subject matters hereafter quoted, there will be on almost every class night, either Dictation, Conversation, or Reading from a Standard Author, officially appointed.

The Direct Method will be made use of.

Idiomatic use of the Definite Article.

Irregular and Compound Nouns : Construction of sentences.

The Reflexive Verbs, with exercises.

Irregular Verbs. Exercises, Commercial Letter-writing.

Translation.

Lessons in Direct Method introducing Irregular Verbs.

The French Prepositions with the Infinitive.

The French " Money " Terms.

French " Weights and Measures."

Short Commercial Letter, correction in class.

Idiomatic uses of French Prepositions such as *en*, *dans*, *parmi*, *entre*, *vers*, and *envers*.

The Subjunctive Mood. Use of Conjunctions governing same.

Words and clauses requiring same.

Verbs with a Transitive or Intransitive meaning.

The Past Participle. The Adverb

The Verb "*Faire*" and its idiomatic uses. Verb "*Faire*" followed by Infinitive.

Original Compositions : Criticism in Class by students.

Idioms commonly used. Commercial letter. Author.

General commercial expressions in Banking and Financial operations.

GERMAN.**JUNIOR.**

Teacher :

M. P. CRINION.**Friday, 7.30 to 9.35.**

The instruction will comprise pronunciation, reading, translation into English, Elementary Grammar, simple object lessons and conversation in German.

Conversations by direct method will be continually employed. Exercises or Readings from a Standard Author officially appointed. Names of familiar objects.

The use of the Definite Article and verb *sein* in sentences. Genitive of Strong Declension, and verb *haben* in sentences.

Conversation, introducing Indefinite Article, Pronouns, and the simple senses of weak verbs.

Sentences introducing simple Prepositions; order of words in simple sentences illustrated.

Weak Declension of Nouns, the verb *werden*.

Conversation, introducing the plurals of nouns, numerals (1 to 20), simple conjunctions.

Determinative Adjectives, order of words in Compound Sentences
Prepositions Auxiliaries of Mood. Dictation.

Declension of Adjectives: Conjugation of Strong Verbs, and free composition.

Relative Pronouns. Original Numbers.

Inseparable Verbs. Indefinite Pronouns.

Passive Verbs. Comparison of Adverbs.

Reflexive Verbs.

Impersonal Verbs.

Separable Verbs.

Forms of simple private correspondence.

Expressions of weight, and dimension.

Simple conversations for shopping and travelling.

SENIOR.**Wednesday, 7.30 to 9.35.****GRAMMAR.**

Declension of Nouns.

Prepositions.

Declension of Adjectives.

Model Auxiliaries.

Weak verbs, passive Verbs.

Pronouns. Strong Verbs.

Cardinal and Ordinal numbers.

Comparison of Adjectives.

Inseparable and separable Verbs.

Syntax of the Article.

Syntax of the Infinitive.

Reflexive Verbs.

Syntax of Model Verbs.

Arithmetical Terms.

Impersonal Verbs.

Syntax of Subjunctive, and exercises.

Syntax of Participles.

Verbs governing the dative.

Difficult exercises in composition, and in translation.

CONVERSATION.

Conversations on the following subjects will be held concurrently with the study of Grammar :—

The Dwelling-house, the Kitchen, the Breakfast, the Writing Lesson, the Garden, the Farmyard, the Parlour, the Year, the Clock, the Library, Epistolary Correspondence, the Post Office, Clothing, the Railway Station, the Village, the Farm-house, the Spring, the Summer, the Autumn, the Winter, Money, Weights and Measures.

The reading of an officially appointed Standard Author will also be undertaken.

COMMERCIAL CORRESPONDENCE AND ARITHMETIC.

COMMERCIAL CORRESPONDENCE.

Teacher :

D. K. LEAHY.

Monday, Junior A—7.30 to 8.30.

Tuesday, Junior B—7.30 to 8.30.

Wednesday, Junior C—7.30 to 8.30.

Thursday, Junior D—7.30 to 8.30.

Essentials of a good business letter. Parts of a business letter.

Difference between private, official, and commercial letters as regards style and arrangement.

Punctuation of correspondence. Proper paragraphing. Correct spelling and division of words.

The address and subscription of letters. Different modes of address. Addressing envelopes. Enclosures. Folding letters.

Correct use of capital letters. The possessive case. Appropriate phrases for beginning and ending letters.

Correct use of pronouns. Shall and will ; should and would.

Concord of noun and verb. Sequence of tenses.

Clearness and force : (a) proper meaning of words ; (b) arrangement and emphasis of words ; precision in the use of synonyms. Idiomatic use of prepositions.

Rules of essay-writing. How to break up a subject. Beginning an essay. Division and sub-division of subject.

Unity of the sentence : various kinds of sentences.

The essentials of a good paragraph.

Condensing sentences. Writing of telegrams. Confirmation by letter.

Note-taking and summarising. Paraphrasing. Abbreviations used in commercial correspondence.

Throughout this Class the students will be required to write specimen letters, dealing with business transactions. Home-work will be set for this purpose and for Essay-writing.

COMMERCIAL CORRESPONDENCE.**SENIOR.****Friday, 7.30 to 8.30.***Business Correspondence of a more Advanced Character.*

Letter-writing in general.

English Grammar: Its bearing on composition.

Punctuation: Its advantages and abuse.

Grammatical Analysis: Its value in composition.

Accuracy in the form and in the construction of words.

The choice of words. Accuracy in the meaning attached to them.

Perspicuity—attained by brevity, simplicity, directness, arrangement of words, precision of meaning.

Essay-writing.

The sentence: Various kinds—short, long, periodic, loose, balanced. Unity of thought.

The paragraph: Its unity and coherence; mutual relation of its sentences; indication of its theme.

Emphasis and inversion. Use of detail. Figures of speech.

Writing of reports based on suggested subjects of reference.

Indexing and Precis-writing. Direct and Indirect Narration.

The copying from abbreviated matter or carelessly-written manuscript of business letters, advertisements, and circulars.

Supplying copy to printers. Routine of getting matter printed
Correction of proofs.

N.B.—Arrangements will be made with the printing school for a practical demonstration of this subject.

Throughout the Session, Home-work will be set on Business letter writing, and on Essay composition.

COMMERCIAL ARITHMETIC.**JUNIOR.****Monday, Junior A—8.35 to 9.35.****Tuesday, Junior B—8.35 to 9.35.****Wednesday, Junior C—8.35 to 9.35.****Thursday, Junior D—8.35 to 9.35.**

Long and cross tots. Averages.

Short and approximate methods of calculation.

Calculation of market prices, and graphical representation of same. Graphical representation of statistics, &c.

Decimalisation of money, weights, and measures; use in such calculations as those of costs of materials.

The Metric System and decimal coinage.

Conversion of the principal foreign currencies, weights, and measures.

Practice: Simple, compound, decimalised.

Application of unitary method to calculation of percentages.

Simple interest. Preparation of Tables of Interest.

Trade and Cash Discounts.

Discount of Bills of Exchange.

Commission and Brokerage.

Proportion and prices of mixtures.

Mensuration of plane figures and rectangular solids, with commercial applications. Specific gravity: its use in the calculation of weights.

COMMERCIAL ARITHMETIC.**SENIOR.****Friday, 8.35 to 9.35.**

Methods of approximation.

Advanced exercises in Simple Interest.

Bank calculation of Interest.

Calculations based on Bills of Exchange.

Exchanges and Exchange Operations.

Bankruptcies and Dividends.

Partnerships.

Equation of Payments.

Profit and Loss. Alligation.

Stock and Share transactions, with allowance for commission, and registration fees actually charged.

Arithmetical and Geometrical Progressions.

Logarithms and logarithmic tables.

Compound Interest.

Annuities (life, lease, redemption, and Land Court).

Insurance.

Calculation of interest and sinking funds on State and Municipal loans. Depreciation Methods of calculation.

COMMERCIAL GEOGRAPHY.

Teacher :

M. WHEELER.

Friday, 8.35 to 9.35.

General considerations with regard to Commerce.

TRADE.—Imports ; exports ; balance of trade ; general and special Commerce ; facilities and hindrances to trade, such as languages, tariffs, bounties, currencies, weights and measures.

Foreign markets.

PHYSICAL GEOGRAPHY.—Climate, configuration and their economic effects.

Influence of Physical Geography on Commercial activity.

COMMODITIES.—Their nature ; places of origin ; the geographical and local conditions under which they are produced ; quantities available for export ; centres of industry ; reasons for their location.

COLONISATION.—The British Colonies ; position ; climate, &c.

TRANSPORT.—Navigation ; telegraphs ; distances ; trade routes and ordinary modes of conveyance to important markets ; canals and railways ; ship canals ; ports ; harbours ; harbours of refuge and coaling stations.

THE GREATER INDUSTRIES.—Coal ; iron and steel ; textiles ; beverages ; chemical industries, &c.

Special attention will be given to the Commercial geography of Ireland and of the United Kingdom.

Essays will be set as home work.

BOOK-KEEPING.

Lecturer :
M. MORRISSEY.

JUNIOR.

- Monday** —Junior A., 7.30 to 9.35.
Tuesday —Junior B., 7.30 to 9.35.
Wednesday —Junior C., 7.30 to 9.35.
Friday —Junior D., 7.30 to 9.35.

The cash book (simple form) and petty cash book.

Personal accounts and statements of Account.

Goods and profit and loss account.

The form and uses of purchase book, sales book, return book, and stock books.

Simple documents, invoices, cheques, &c.

Principle and advantages of double entry.

The journal—its form and uses in modern business.

Cheques, advanced form of cash book with columns for discount, office cash, and bank.

Posting of these books in ledger.

Trial balance.

How a trading account, as a substitute for a goods account, is kept.

The profit and loss account. Distinction between gross and net profit.

The balance sheet of sole trader.

The explanation of the commercial terms in book-keeping, and of their abbreviations, will be dealt with from time to time during the Course.

The lessons towards the end of the session will be devoted to revision.

INTERMEDIATE.

Lecturers :
M. MORRISSEY.
M. F. FLOOD.

Thursday, Intermediate A—7.30 to 9.35.

Monday, Intermediate B—7.30 to 9.35.

More advanced treatment of the foregoing.

Principle and advantages of double entry.

Opening a set of books from particulars given.

The journal—its uses in modern business.

The cash book, different forms, cheques, reconciliation statements, interest petty cash system. Transferable leaf ledgers.

The form and use of—the purchase book, the sales book, and return books.

The posting of these books to ledger, and preparing of trial balance.

Bills of exchange, bill books, posting to ledger, treatment in accounts.

Consignment accounts. Contract accounts. Departmental accounts.

Partnership and partnership accounts.

Accounts necessary at formation and dissolution of partnership.

The trading account.

The preparation of trial balance of—Profit and loss account—balance sheet of sole trader or of partnership or public company—Preparing for audit.

Reserve for bad and doubtful debts and discount.

Depreciation of fixed assets.

SENIOR.

Lecturer :
M. F. FLOOD.

Tuesday, 7.30 to 9.35.

The work of the previous year will be continued, and more complex cases considered.

Full treatment of the accounts kept by Limited Companies, and the methods of keeping them—including formation, carrying on, and winding-up.

Bankruptcy with all its details.

Capital and current charges ; sale, purchase, and winding-up of business.

Conversion of single entry accounts to double entry.

Royalty accounts.

Joint venture accounts.

Receipts and expenditure accounts.

Self-balancing ledgers.

ACCOUNTANCY.

Lecturer:

M. F. FLOOD.

Thursday, 7.30 to 9.35.

ACCOUNTING.—Various systems, including the double account system, and their application to the needs of private and public undertakings. Statutory forms of accounts. Statistical books.

TRIAL BALANCE.—Differences in Books ; apportionments, adjustments, and closing entries ; cost accounts, branch accounts.

BALANCE SHEET.—The reading of the balance sheet. The form in which it should be drafted. (a) Assets.—Stock, and its valuation ; book debts—valuation and reserves ; investments—their valuation. Premises and depreciation of premises, furniture, plant, and machinery. (b) Liabilities.—Secured, unsecured, contingent. (c) Capital.

Sinking funds, suspense accounts, special and secret reserves, goodwill. Reconstruction of companies. Systems with internal check, including check figure systems. Bankruptcy.

Methods of reducing labour in book-keeping, including tabular systems, and card, transferable leaf and slip systems. Foreign currencies and their treatment in the accounts.

COMPANY LAW AND PROCEDURE.—Conversion of private firms into joint stock companies. Promotion and flotation of various kinds of companies. The issue of shares and debentures. Various kinds of capital and shares. Letters of allotment and regret. The Statutory requirements as to memorandum and articles of association and Table "A." Management, meetings, and returns to Registrar of Joint Stock Companies. Incidence of goodwill. Dividends, &c. Amalgamations, reconstruction, and liquidations.

COMMERCIAL LAW.—General principles of the law of Contract. Contracts of (a) sale ; (b) negotiable instruments ; (c) carriage and affreightment. Mercantile persons, principal and agent. Mercantile property and guarantees. Outlines of the law of partnership and bankruptcy.

BUSINESS METHODS.

Lecturer :

JUNIOR.

Wednesday, Junior A.—7.30 to 8.30.

Junior B.—8.35 to 9.35.

The object of this class is to give an intelligent idea of the ordinary duties of a junior clerk in merchants' or other offices. The instruction, therefore, will be of a practical nature throughout, and demonstrations will be made with modern business appliances.

No one will be allowed to join the class who has not a satisfactory knowledge of Commercial English and Arithmetic. Students are generally recommended to supplement their training in office routine by attendance at the class in Commercial Correspondence and Arithmetic.

Office Routine.—Introductory. Business habits, and office work.

The handling of correspondence.

(a) *Letters despatched.*—Office stationery. Form of business letters. Copying letters. Making up letters for post. Addressing, &c.

Postal rates—Home, foreign, colonial.

Other postal regulations and services ; registration and insurance of letters, express delivery, &c.

Indexing of various kinds.

Postage book.

(b) *Letters received.*—Letter registers. Docketing.

Filing of letters by different systems, including the card index, and its application to various purposes.

Telegrams—home and foreign, rates. Lettergrams.

Telegraphic codes and cyphers.

Telephone, receiving, transmitting, and recording messages.

Remitting money. Postal orders. Money Orders—home and foreign. Telegraphic Money Orders. Cheques.

Simple business forms. Price lists, orders, delivery, dockets, &c.

Invoices, statements, receipts.

Business terms and abbreviations.

Exercises will be set on the above, and Essays required for Home-work.

INTERMEDIATE.

Tuesday, 8.35 to 9.35.

Lecturer :

M. WHEELER.

This class is intended for Students who have gone through the work of the Junior class, or have been some time at business.

Firms and partnerships. Companies, limited and unlimited.

Finance.—Postal and Money Orders. Cheques—varieties, crossings, endorsements.

Bills of exchange, acceptance, endorsement, days of grace, discounting, renewing, retiring. Dishonouring—liability of parties. Furnishing of accounts in connection with renewing, &c. of B/E. Accommodation Bills. Promissory Notes. I.O.U.'s. Bills of sale.

BANKING.—Deposit and current accounts. Banking documents, terms, and ordinary mercantile Banking transactions.

HOME TRADE.—Routine of buying and selling goods. Tenders and estimates. Firm offers. Contract notes. Orders. Invoices. Debit and credit notes. Statements. Account sales. Discounts. Commissions. Brokerage. Agencies.

TRANSPORT OF GOODS.—Delivery books, consignment notes, advice notes, railway rates, railway and steamship routes.

MARKET REPORTS and their interpretation.

STOCK EXCHANGE, dealings and technical terms.

COMMERCIAL terms and abbreviations.

Exercises will be given in the way of essays and drafting of reports, especially for Home-work during the Session.

SENIOR.

Lecturer :

M. WHEELER.**Thursday, 8.35 to 9.35.**

JOINT STOCK COMPANIES and limited partnerships. Share debenture and loan capital. Preferred, ordinary, deferred, and founders' shares. Capital, nominal and subscribed. Prospectuses and the procedure of forming, carrying on, and winding-up Limited Companies.

BANKING AND FINANCE.—The currency and coinage of the United Kingdom, and of the chief commercial countries. Theory of Foreign Exchanges. The money market. Foreign bills of exchange.

The Banking System : Its organisation and functions—relationship of a bank to (a) its branches ; (b) agents ; (c) other banks ; (d) borrowers. Control and distribution of capital. Sources of profit. Published accounts—Bank-note issue, economy of precious metals. Short history of the Bank of England. Banking system of the United Kingdom, Banking documents and terms. " Legal Tender."

COMMERCE AND TRADE.—Home and foreign trade. Imports, exports, and balance of trade.

SALE OF GOODS.—Terms of sale, and law relating to sale of goods. Invoices generally in connection with importation and exportation. Average due dates. Accounts current.

SHIPMENT OF GOODS.—Certificates of origin, formalities ; Consular invoices ; Consignments. Charter parties ; bills of lading ; freights ; dock and warehouse work. Bonded stores. Cubic and superficial measurements of packages.

The Metric System.

INSURANCE.—Short history of Insurance, fire, life, marine, and other forms. Lloyd's. General and particular average and adjustments.

Terms and abbreviations used generally in connection with commerce, Banking, Insurance, and shipping.

Exercises will be set in the writing of Essays and reports, especially for the work during the Session.

SHORTHAND (Pitman's System).

Teachers :

F. C. WALLIS-HEALY.**M. F. BOYLE.****M. QUANE.**

Junior Class A.—	Wednesday, 7.30 to 9.35.—Men and Boys.
Junior Class B.—	Thursday, 7.30 to 9.35.—
Junior Class C.—	Monday, .. 7.30 to 9.35.—Women and Girls.
Junior Class D,—	Tuesday, .. 7.30 to 9.35.
Intermediate Class A.—	Friday, .. 7.30 to 9.35.
Intermediate Class B.—	Thursday, 7.30 to 9.35. .
Senior Class.—	Tuesday, .. 7.30 to 9.35.

JUNIOR.

Phonetic basis of Pitman's shorthand; alphabet; simple consonants; joined consonants; upward and downward R; consonant combinations.

Long vowels; vowel places; long vowel between two consonants; short vowels; short vowel between two consonants.

Grammalogues; diphthongs; additional sign for S and Z.

Initial S circle; initial SW circle; initial ST loop; final S circle; final ST and STR loops.

Distinction between use of circle and stroke S; loop ST and S, T; initial hooks; special explanation of right and left hooked curves fr, vr, &c.

Double consonants; circle S prefixed to initial hook; final hooks; circle S added to final hook; final hook and final vowel.

The aspirate (four methods of expressing).

Upward and downward L and R.

The halving principle (six phases).

W and Y series of diphthongs; vocalisation of the PR and PL series.

Prefix Con or Com; suffix ING; stops, &c.

Shorthand reading practice and transcription.

"Tion" hook."

Additional double consonants.

The aspirate.

Upward and downward L and R.

The halving principle.

Elementary speed practice.

INTERMEDIATE.

In this class the foregoing principles and methods will be further developed.

Dictation of commercial correspondence and reports of company meetings.

Reading and transcribing notes.

Practice for speed.

SENIOR.

Tuesday, 7.30 to 9.35.

Teachers :

F. C. WALLIS HEALY.

M. F. BOYLE.

Double length principle.

Vocalisation of the PR and PL series.

W and Y series of diphthongs.

Dissyllabic diphthongs.

Prefixes and suffixes.

"Corresponding" style grammalogues and contractions.

Principles of phraseography and illustrations.

Punctuation marks ; shorthand reading practice.

Adaptation of phonography to the practical needs of the note-taker by means of further abbreviating devices, &c.

Writing in position.

Significant marks and interpretation for transcription ; representation of figures.

Compounds of here, there, and where ; negative prefixes.

Reporting grammalogues.

Reporting contractions.

Advanced phraseography.—General, business, political, law, &c.

The principles of abbreviation by means of intersection.

Similar words distinguished by difference of outline.

Dictation at slow rates for speed practice up to 40 words a minute will be commenced about the middle of the session, and continued concurrently with the development of the more advanced abbreviating principles.

SHORTHAND SPEED.

Teacher :

M. F. BOYLE.

Friday, Junior Speed— 7.30 to 9.35.

Wednesday, Intermediate Speed—7.30 to 9.35.

Monday, Senior Speed— 7.30 to 9.35.

JUNIOR.

Includes (1) advanced theory Students who have a good general knowledge of the principles of the system, as developed in the "Instructor," and the various special abbreviating devices, and who are competent to commence slow dictation practice ; and (2) those pupils who have already commenced speed work and whose rate of writing has not passed 40 words a minute.

INTERMEDIATE.

In this Class Pupils will be enrolled whose speeds range between 40 and 70 words a minute, approximately.

SENIOR.

The Senior speed class will include Pupils writing from 80 to 120 words a minute and over.

Attention will be given when opportunity offers to practice for Press and general reporting, summarising, &c.

In all the speed classes illustrations of standard outlines, contractions, phrases, and other abbreviations, will be displayed on the blackboard and explained, and practical advice and suggestions offered. Special attention will be given to dictation of commercial correspondence, reports of company meetings, &c., and a certain amount of time will be devoted by Students each class evening to reading or transcribing their notes.

Students will be prepared and presented for speed certificate examinations towards the close of the Session.

SHORTHAND AND TYPEWRITING.

SHORTHAND.

Teacher :
A. MANLY.

Junior Classes—Monday, Wednesday, and Friday—7.0 to 10.5.

Intermediate Classes—Tuesday, 7.0 to 10.5.

Senior Classes—Thursday, 7.0 to 10.5.

The subjects of Shorthand and Typewriting will be taken concurrently, and constitute one class at the one fee of 5s. for the Session.

Each Student is required to do one hour's work in the Typewriting Class, and one hour's work in the Shorthand Section.

The Programme of work in Shorthand will be similar to that in the Shorthand Classes described above.

TYPEWRITING.

Teachers :
JAMES O'SHEA.
MISS C. MORAN.

Junior Classes—Monday, Wednesday, and Friday—7.0 to 10.5.

Intermediate Classes—Tuesday, 7.0 to 10.5.

Senior Classes—Thursday, 7.0 to 10.5.

The various type-writers and their keyboards; arrangement of letters, figures, stops; general structure of the machines, and their essential parts; ribbons and pads; fingering exercises; copying of easy matter, and graduated writing.

Practical exercises.

The machines used are the "Remington," "Yost," "Williams," "Empire," "Smith Premier," "Densmore," and "Oliver."

The Classes are held from 7.0 to 8.0, 8.5 to 9.5, and 9.5 to 10.5, each Student working for one hour.

Domestic Economy.

Domestic Economy.

DEPARTMENT COURSES.

The actual course for Students preparing for the Department Certificates is set out on page 33.

The Syllabuses for these Courses are printed here for the direction of Students, although the whole of the work is not yet provided for, in our schools.

COOKERY.

FIRST YEAR.

Economy in the choice, purchase and storage of foods.

Classification of foods, food values.

A knowledge of the primary methods of: Boiling, Roasting, Stewing, Grilling, Frying, Baking, Steaming.

Fuels and temperatures suitable for various processes.

The making of beverages—tea, coffee, cocoa, &c.

HOUSEWIFERY.

SECTION A,

Care, cleaning and management of grates, ranges and stoves.

Construction and care of sinks. Cleaning of kitchen and of household utensils and furniture.

The making of simple cleaning and polishing agents.

Cleaning and care of lamps.

Setting of tables for various meals.

Weekly routine of the house.

Household accounts. Planning of household expenditure.

Cleaning of boots, gloves and chamois.

SECTION B.

NEEDLEWORK.—The various stitches used.

Patching and darning of cotton, woollen, damask, and dress materials.

Making of simple hand-sewn undergarments.

COOKERY.**SECOND YEAR.****SECTION A.**

More advanced exercises in the processes set out in the first year syllabus.

Re-heating of foods.

Invalid Cookery.

Diets, and feeding of infants.

Compiling simple menus and practice in cookery of same.

Bread and pastry making.

Egg Cookery and Lenten fare.

Trussing of fowl and rabbits.

SECTION B.

LAUNDRY-WORK.—Various cleaning and bleaching agents; choice, use and storage.

Choice and care of Laundry utensils.

Preparation for washing day.

Removal of stains. Simple disinfectants.

Washing and finishing:—

White clothes (personal and household).

Collars and cuffs.

Flannels and Woollens.

Prints and muslins.

Laces and silks.

NEEDLEWORK.

Care of, and use of sewing machine. Drafting of simple patterns of undergarments and blouses. Making of undergarments, blouses, and children's clothes. Renovating garments

COOKERY**THIRD YEAR.****SECTION A.**

Preservation of foods.

Bottling of fruit and vegetables.

Pickling of meat and vegetables.

Jam making.

Fancy bread-making.

Cake making.

Sweets and pastries (including meat pies).

Salads.

SECTION B.

LAUNDRY-WORK.—Washing and finishing man's shirt, chintz, cretonne and coloured embroidery, lace curtains, children's clothes. Dry cleaning laces, furs, &c.

SECTION C.

HYGIENE.—The structure of the body in relation to its functions. Food and its digestion. The blood and its circulation. Air in relation to health. The respiratory system. The skin and its functions. Simple methods of ventilation. Domestic water supply. Sources of contamination. Drainage and disposal of refuse. Personal Hygiene.

DRESSMAKING.

The making of lined walking skirts, underskirts, and plain, fancy blouses.

COOKERY.**FOURTH YEAR.****SECTION A.**

The compiling of advanced menus, the setting and decorating of dinner tables, the serving of meals and accompaniments, the making of superior soups, luncheon dishes, entrees, jellies, and creams, hot sweets, savouries and sauces, various sandwiches, the trussing and cooking of game. Cake making and decorating. Beverages and cordials.

SECTION B.

FIRST AID AND SICK NURSING.—First Aid treatment of bleeding, fractures, dislocations, &c.

Wounds and their treatment, simple bandaging, poultices, sprains and bruises. Burns and scalds.

Poisons and their antidotes. Fits and their treatment. Drowning and artificial respiration.

Care and treatment of invalids and children. The choice and arrangement of the sick room. Common ailments and their treatment by simple home remedies. The nature of the commoner infectious diseases. Isolation. The treatment of tuberculosis patients. Disinfectants and disinfection.

DRESSMAKING.

Making of coats and skirts.

Making of frocks.

DOMESTIC ECONOMY.

Qualified Students in this section are expected to follow courses of at least two subjects rather than a single class. The Lectures in Junior Physics (page 91), should be of special value to students in the Cookery classes.

AFTERNOON CLASSES.**HOUSEHOLD COOKERY.**

Teacher :

MISS M. BELLINGHAM TODD.

Tuesday, 3 to 5.5 p.m. (Kevin Street).

This course will be arranged to meet the requirements of heads of households, and the class will open on Tuesday, 1st October. Instruction will be given on kitchen management; keeping of stores; cleaning, etc.; the preparation of food for the sick, with reference to special diet for young children and adults; new and varied dishes for dinner, luncheon, breakfast, supper and tea.

For further subject matter see page 220.

DRESSMAKING.

Teacher :

MISS K. M. MURPHY.

Class E, Junior—Monday, 3 to 5.5 p.m. (Chatham Row).

Class F, Senior—Friday, 3 to 5.5 p.m.

This Class will open on Monday, 30th September.

See page 224 for subject matter.

COOKERY.

Teacher :

MISS K. CLANCY.

Monday, Junior— 3 to 5.5 p.m. (Rutland Square).

Wednesday, Senior—3 to 5.5 p.m.

This Class will open on Wednesday, 2nd October. See page 224. for subject matter.

DRESSMAKING.

Teacher :

MISS K. M. MURPHY

Class G—Thursday, 3 to 5.5 p.m. (Rutland Square).

This Class will open on Thursday, 3rd October. See "Home Dressmaking," page 226.

COOKERY.

(KEVIN STREET).

Teacher :

MISS M. BELLINGHAM TODD.**Lecture : Tuesday, 7.30 to 9.35.****Practical Work :****Class A.—Monday, 7.30 to 9.35.****Class B.—Wednesday, 7.30 to 9.35.****Class C.—Thursday, 7.30 to 9.35.—for Senior Students.**

The instruction during the Session is progressive, consisting of Demonstration and Practice lessons, and includes lectures on Theoretical Domestic Economy.

The primary methods of cookery. Casserole of potatoes, Corn-flour mould, Gingerbread.

The four points of successful cookery. Irish stew, Yorkshire pudding, Apple pie.

Roasting.—Roast mutton, Onion sauce, cheap Seed cake, Rice pudding.

Using up cold meat.—Rissoles, Shepherd's Pie, Meat patties. Oatmeal biscuits, Sandwich cake.

Boiling meat.—Boiled beef, Dumplings and Broth.

Swiss Puddings, Christmas cake, iced.

Soups.—Vegetable and bone.—Lentil and Potato Soups.

Sweet Omelette, Scones, Mince Pies, Flaky Pastry.

Bread and Cakes.—Yeast bread, brown and white, Soda Bread, Sponge cake, Shrewsbury and Queen cakes.

Fried Bacon, Savoury Omelette.

Frying.—Wet and Dry.—Fried Steak.

Dough nuts, Pancakes, Cocoanut and Lemon Buns.

Broiling.—Chops, Steak and Fish. Custard Puddings, Steamed Apple Pudding, Macaroni Cheese, Raspberry Buns.

Vegetables.—Potatoes Boiled, Baked, Steamed, and Fried; Cabbage, Cauliflower, Carrots and Turnips Boiled, Stewed Lentils, Spinach and Onions; Tomatoes baked.

Breakfast and Savoury Dishes.—Tea, Coffee, Cocoa, Porridge, Scotch eggs, Kippers, Fried Sausages, Eggs—boiled, fried, poached, and buttered; Milk rolls.

Fish.—Boiled and Baked, Fried in Batter, Fried with egg and bread crumbs, Fish pudding and cakes, Kedgerree, Anchovy, Parsley and white sauces ; Jam roly-poly, Apple and Currant dumplings.

Cookery for the Sick and Convalescent.—Beef teas, Mutton broth, Gruel, Sheep's head, Custard, Irish moss and Orange jellies, Stewed celery, Egg snow, Egg flip, Steamed chop, Baked fish, Invalids' cake.

Soups.—Tomato, Gravy, Fish, &c. ; Fried liver and bacon, Stewed tripe, Bread pudding, Seed cakes, Semolina pudding.

Potato Salad, Salad dressing, Stewed fruit, Welsh Rarebit, Rice, and Cheese, &c.

Simple Jellies and Creams.—Lemon and Cowheel jellies.

HYGIENE AND HOUSEWIFERY.

Instruction in these subjects will be provided if required by six students working for the Department Courses.

CONFECTIONERY.

A class in the above subject will be opened if a sufficient number of students present themselves for instruction.

MEN'S COOKERY CLASS.

A course of instruction will be arranged to meet the requirements of Chefs, Mess Cooks, &c., if a sufficient number of students present themselves.

COOKERY.**RUTLAND SQUARE.**

Monday, Junior Lecture—7.30 to 9.35.
 Tuesday, Junior Practical—7.30 to 9.35.
 Wednesday, Senior Lecture—7.30 to 9.35.
 Thursday, Senior Practical—7.30 to 9.35.
 Monday or Wednesday—(3.0 to 5.5.)

Teacher :
MISS K. CLANCY.
 with Miss M. J. DOYLE.

JUNIOR CLASS.

SOUP-MAKING.—Lentil, pea, potato, tomato, gravy, mutton broth, &c., &c.

COOKING MEAT OR FISH.—Stewing beef, mutton, tripe, rabbit, fish, and Irish stew.

Roasting mutton, beef, and pork (gravies).

Boiling mutton, corned beef, fish.

Grilling chops, steaks.

Frying bacon, sausages, chops, steaks, and onions, liver, and fish.

Reheating cottage pie, hash, mince, fish pie, fish cakes, and kedgeree.

PASTRY.—Short, flaky, suet pastry, fruit pie, jam tarts, meat pie, sausage rolls, Cornish pasties, meat puddings, dumplings and roly-poly, pancakes, fritters, and Yorkshire pudding.

CUSTARDS.—Baked, steamed, and cup custards.

MILK PUDDING.—Rice, sago puddings ; ground rice and cornflour moulds.

SUET PUDDINGS.—Treacle, lemon, Christmas, and fruit puddings.

CHEESE DISHES.—Welsh rare-bit, macaroni cheese, rice and cheese.

SAUCE-MAKING.—Plain white sauce, parsley, caper, egg, Anchovy, cornflour, sweet and jam sauces.

BREAD AND CAKES.—White and brown yeast bread, scones, sponge cakes, fruit cakes, rock cakes, short bread, and oatmeal biscuits.

INVALID DISHES.—Beef tea, barley water, boiled and poached eggs, steamed fish and gruel.

VEGETABLES.—Potatoes, boiled, baked, steamed and fried. Green vegetables. Root vegetables. Dried vegetables.

MISCELLANEOUS.—Tea, coffee, cocoa, baking powder, clarified fat, porridge, potted meat, sandwiches, omelettes, salad.

The lighting and management of a kitchen fire and gas stove. The construction of open and closed ranges, with regard to the flues, ovens, hot water supply, &c.

SCULLERY WORK.—The proper construction and cleaning of a scullery sink, &c. The cleaning of utensils used in cookery.

The relative temperatures (moist and dry) in the primary methods of cookery. Simple tests for finding the required temperature of water, fat, oven, &c.

Primary methods of cooking. Simple rules based on the underlying principles. Cleanliness in the preparation and cooking of food. The proper storage of food. Result of carelessness in these matters.

Economy in cooking (time, fuel, and food material). The use of fore-thought, and routine in kitchen work and marketing.

Suitable food for infants, children, and invalids. Variation in diets advisable for hot and cold weather, and for different occupations.

Arrangement for simple meals for a week. Vegetable and meat substitutes.

SENIOR CLASS.

Wednesday, 7 30 to 9.35.

The second year's Course is intended for those who have already attended the first year's Course and have attained some proficiency in Plain Cookery. Soups, Fish, Entrees, Meat, Vegetables, Puddings, cold Sweets, Savouries, and Cakes.

The Course will consist mainly of practical work. There will be occasional demonstrations.

LECTURE.—Food, meals for a family, quantity, choice, price, market value of food.

HOUSE WORK.—Periodical cleaning, furnishing, warming, lighting, choice, care, and cleaning of floor coverings.

THE SKIN.—In health and disease. Care of toilet brushes, combs, and sponges.

VENTILATION.—The composition of air, inspired and expired. Respiration. Effects of respiration and combustion on air. Simple ways of ventilating.

Advantages of ready money transactions. Economical administration. Keeping household accounts.

HYGIENE AND HOUSEWIFERY.—Arrangements will be made for meeting the needs of those who are preparing for the Department Course, if six Students make application.

COOKERY (Afternoon).

SUPERIOR HOUSEHOLD CLASSES.

Monday, Junior—3 to 5.5

Wednesday, Senior—3 to 5.5.

The work done in these Classes will be generally on the lines of the foregoing Syllabuses, but will be more suitable for superior housekeepers, including higher class Cookery, Hors d'œuvres, Soups, Entrees, Entremets, Savouries, Sweets, Icing, and decorating Cakes, &c.

DRESSMAKING.

(CHATHAM ROW).

Class A, Junior—Monday, 7.30 to 9.35.

Class B, Senior—Friday, 7.30 to 9.35.

Class E, Junior—Monday, 3.0 to 5.5.

Class F, Senior—Friday, 3.0 to 5.5.

Teacher:
Miss K. M. MURPHY.

Assistant:
Miss A. CLARKE.

DRESS CUTTING.

JUNIOR.

The making of lined walking skirts, under skirts, and plain and fancy blouses.

Choice of materials and principles of cutting out.

Method of taking measurements. Drafting of blouse pattern.

Pattern tested, prepared, and planned out on material.

Blouses cut out. Method of tacking up.

Rules for fitting and altering. Joining seams.

Sleeve and collar. Sleeve pattern tested and prepared.

- Method of measuring and fixing tucks.
 Method of planning and cutting out sleeves. Tacking up.
 Machining. Pressing.
 Making and setting on collar. Setting in sleeves.
 Finishing blouses. Putting on fastenings. Various sorts.
 Drafting skirt pattern. Preparing.
 Pattern completed, corrected, and planned out.
 Pattern planned out on lining and material.
 Skirt tacking commenced. Lining tacked out on material.
 Skirt tacked up. Stitching up started, stay-tape fixed.
 Notching and pressing seams.
 Method of arranging placket opening.
 Method of fitting and setting on waist-band.
 Pocket-making and fixing.
 Measuring and turning up bottom edges of skirts.
 Casing and finishing off bottom edges of skirts.
 Methods of braiding or binding bottom edges of skirts.
 Method of cutting out blouse on the cross.
 Points to remember when cutting out fancy blouses.
 Fancy stitches taught. Fancy knots, buttons, and bows suitable for blouses.
 General finishings. Work corrected.
 Machining, darning, and patching on dress material. Woollen and cotton. Method of patching print and linen.

SENIOR.

- Principles and method of taking measurements of bodice and sleeves. Drafting pattern of tight fitting bodice.
 Continued drafting of bodice pattern. Hints on choice of materials. Linings.
 Drafting finished. Pattern tested and prepared. Drafting sleeve. Drafting collar.
 Drafting bodice to $\frac{1}{2}$ -inch scale and $\frac{1}{4}$ -inch scale. Patterns tested and prepared.
 Making of coats and skirts.
 Notes and diagrams of skirts. Drafting four-gored skirt. Planning and cutting out.
 Tacking out and tacking up.

Planning and cutting out bodice. Taking out bodice. Tacking up. Fitting.

Stitching up. Notching seams. Pressing seams (flat).

Binding seams, different methods. Binding with sarcenet ribbon.

Putting fasteners on skirts. Setting into waist bands.

Arranging bodices for hooks and eyes, edge to edge. Finishing edges. Pressing. Stitching up. Fitting seams.

Arranging decorative sections of bodices.

Making up sleeves. Finishing of same.

Making of frocks.

HOME DRESSMAKING.

(RUTLAND SQUARE).

Teacher:

Class C, Junior.—Wednesday, 7.30 to 9.35.

Miss K. M. MURPHY.

Class D, Senior.—Thursday, 7.30 to 9.35.

Class G, Aft.— Thursday, 3.0 to 5.5.

JUNIOR CLASS.

The making of lined walking skirts, underskirts, and plain and fancy blouses.

Measurement for blouse pattern. Choice of materials. Method of taking measures. Drafting blouse pattern.

Planning pattern on material. Material cut out. Stitches taught.

Arrangement of tucks in material. Method of tacking and stitching.

Drafting of sleeve and collar. Sleeve pattern prepared.

Making of sleeves and collar. Sleeves cut out and tacked.

Setting on of collar band. Various methods of fixing on fastenings.

Setting in sleeves. Stitching and finishing.

Notes and diagram of three-gored skirt. Drafting pattern.

Testing, correcting and preparing pattern.

Planning pattern on material. Skirts cut out, tacking started.

Method of making placket opening. Fastenings arranged.

Skirts completed as far as waist bands. Method of putting on waist band and fitting.

Bottom edges pared and prepared for finishing.

Various methods of finishing and braiding skirts.

Pocket-making and fixing into skirts.

SENIOR CLASS.

- Measurement: The taking of measures. Choice of materials.
 Drafting bodice patterns.
 Patterns, tested, corrected, and prepared.
 Pattern planned out on lining.
 Bodice lining cut out. Bodice lining fitted.
 Sleeve and collar drafted, corrected, and prepared.
 Making of coats and skirts.
 Material marked out for skirt.
 Skirt drafting. Notes and diagram of three gored-skirt.
 Four-gored skirt pattern drafted.
 Skirt patterns tested, corrected, and prepared.
 Skirt patterns planned out on lining, and cut out.
 Lining planned on material, and cut out. Material tacked out on lining.
 Skirt tacked up and ready for stitching. Seams stitched up, notched, and pressed.
 Method of measuring and setting on waist band.
 Turning up of bottom edge of skirts, tacking, and paring.
 Pocket-making. Pockets stitched.
 Making of frocks.

NEEDLEWORK.

(CHATHAM ROW).

Class A, Junior—Tuesday, 7.30 to 9.35.

Class B, Senior—Thursday, 7.30 to 9.35.

(RUTLAND SQUARE).

Class C, Junior—Friday, 7.30 to 9.35.

Class D, Senior—Monday, 7.30 to 9.35.

Class E, Aft.—Monday, 3.0 to 5.5.

Teacher:

MISS K. DOYLE.

Teacher:

MISS K. DOYLE.

JUNIOR CLASS.

- The various stitches used.
 Patching and darning of cotton, woollen, damask, and dress materials.
 Making of simple hand-sewn undergarments.
 Lectures on materials used in underclothing, width, and price per yard, also different sizes of needles and threads suitable for various materials.
 Lesson on hemming, sewing, and seaming. Drafting out of chemises for (1) women (2) girls (3) children. Drawing diagrams of garments.

- Cutting out of chemises on materials and tacking together.
 Putting neck-band on to chemise. Lesson on a buttonhole.
 Drafting out drawers. Drawing diagrams.
 Cutting out drawers on material and tacking together.
 Drafting out a shaped band. Putting band on to drawers.
 Drafting out petticoats for (1) women, (2) girls, (3) children.
 Drawing diagrams and cutting out same on material.
 Making up petticoats. Finishing off petticoats.
 Lesson on a flannel patch (1) square or oblong, (2) triangular.
 Drafting out aprons and cutting out on material. Making up
 aprons. Putting on waist-band and finishing off.
 Drafting out a woman's nightdress. Drawing diagrams of same.
 Cutting out nightdresses on material and tacking together.
 Setting on yoke and sleeves.
 Cutting out, making up, and putting on collar.
 Drafting out girl's overall, and cutting out on material.
 Drafting out of girl's overall, and cutting out on material.
 Drawing diagram. Making up overall. Setting on yoke. Making
 sleeves and setting same.
 Finishing off overall, tucks, buttons, button-holes, &c.
 Darning a thin place on material. Binding flannel.
 Drafting out a man's night-shirt. Drawing diagrams and making.
 Putting on cuffs. Making and setting on collar.
 General finish of garment. Buttons, buttonholes, &c.
 Lesson on the renovating of table linen, bed linen, &c.

SENIOR CLASS.

Care of, and use of, sewing machine. Drafting of simple patterns of undergarments and blouses. Making of undergarments, blouses, and children's clothes. Renovating garments.

Cutting out a reduced or small-size pattern. Cutting out enlarged patterns. Cutting out by (1) proportion (2) measurements. Drawing patterns to scale. Method of obtaining patterns of the various parts of made-up garments.

Cutting out and tacking up paper patterns. Cutting out pinafores.

Lesson on a calico or linen patch, print, or dress patch.

Cutting out chemises. Construction of the garment.

Cutting out drawers. Construction with (1) straight band (2) shaped band.

Drafting out night gowns for girls and women. Fancy night gowns from a plain pattern.

Drafting out Combinations. Diagrams and cutting-out.

Drafting out petticoat bodice. Finishing off.

Drafting out of underskirt or petticoat.

Mending a hole in stocking. Mending a three-cornered tear in dress material. Mending various cuts in table linen.

Linen darning. Grafting. Stocking darning.

Baby clothing. Overalls. French bodices. Night shirts and day shirts.

MILLINERY.

(RUTLAND SQUARE.)

Teacher:

MISS R. SHARPE.

Thursday—Junior, 7.30 to 9.35.

Tuesday—Senior, 7.30 to 9.35.

Wiring and covering bandeaux.

The use of wire; the making of wire frames to measurement.

The covering of wire frames in muslin, net straw, and crinoline.

The lining of hats and bonnets.

The making of wired silk bows.

Hemming with various materials for bows.

Bindings for straw hats, silk, velvet, or satin.

Slip stitch bindings, and the cutting of the material.

Plain silk, velvet, or satin rouleau.

Wire lace for hat trimming.

Floral crowns.

Renovating straw hats. Plateau.

The making of wire bonnet frames. Covering bonnet frames.

The making and covering of buckram mushroom shapes.

The making and covering of child's bonnet shapes.

The making of rosettes.

For Senior Students, more advanced work will be done in the above exercises.

Music.

Municipal School of Music, Chatham Row.

PIANOFORTE.

VIOLIN.

CLARINET.

OBOE.

BASSOON.

TROMBONE.

IRISH PIPES.

FLUTE.

PICCOLO.

FIFE.

CORNET.

BOMBARDON.

HORN.

EUPHONIUM.

DRUMS.

SINGING (TONIC SOL-FA).

The Session will begin on Monday, 30th September, 1912, and end on Saturday, 10th May, 1913.

In the instrumental classes each hour will be divided among four students, all of whom should be present during the whole hour. The time at which each Student is to attend will be arranged in consultation with the Teacher; as a rule each pupil may come on two days in the week so long as the numbers permit.

Special efforts will be made to encourage Irish Music.

Fee for a single Class :—

10s. for the whole Session.

In the case of a *bonâ fide* member of a City Trade Band, the fee will be 5s. for the Session.

PIANOFORTE.**LADIES' CLASSES.**

Teacher :

MRS. H. ANNESLEY

Monday and Friday, 5.25 to 9.40.

Tuesday and Thursday, 5.25 to 7.30.

MEN'S CLASSES.

Teacher :

A. T. CULLEN.

Wednesday, 6.30 to 9.40.

Saturday, 4.0 to 7.10.

VIOLIN.**LADIES' CLASSES.**

Teacher :

Mrs. BLOOM POLLOCK.

Monday and Friday, 6.30 to 9.40.

Tuesday and Thursday, 6.30 to 8.35.

MEN'S CLASSES.

Teacher :

P. J. GRIFFITH.

Tuesday, 6.30 to 9.40.

Wednesday, 6.30 to 9.40.

Thursday, 6.30 to 9.40.

Saturday, 4.0 to 7.10.

TONIC SOL-FA (SINGING.)

Teacher :

W. H. NESBITT.

Tuesday and Thursday, 8.0 to 9.5.

IRISH PIPES.

Teacher :

Tuesday and Thursday, 7.15 to 8.15.

A class for this instrument will be formed if there be a sufficient number of applicants.

CLARINET.

Teacher :

Monday and Friday, 6.30 to 8.35.

OBOE, BASSOON.

Teacher :

Monday and Wednesday, 8.40 to 9.40,

TROMBONE.

Teacher :

Wednesday, 7.30 to 8.30.

Friday, 8.40 to 9.40,

CORNET AND HORN.

Teacher :

ALEX. BURKE.

Thursday, 6.30 to 8.35.

Saturday, 4.0 to 6.5.

BOMBARDON AND EUPHONIUM.

Teacher :

ALEX. BURKE.

Thursday, 8.40 to 9.40.

Saturday, 6.10 to 7.10.

DRUMS

Teacher :

THOMAS MITCHELL.

Monday, Tuesday, Wednesday and Friday, 6.30 to 7.30.

FLUTES.

Teacher :

THOMAS MITCHELL.

Monday and Wednesday, 7.35 to 9.40.

Tuesday and Friday, 7.35 to 9.40.

TIME TABLE FOR SCHOOL OF MUSIC.

No. of Class	NAME OF CLASS	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Pianoforte, Ladies—							
330	Class 1 and 5	5.25—6.25	5.25—6.25	...	5.25—6.25	5.25—6.25	...
332	Class 2 and 6	6.30—7.30	6.30—7.30	...	6.30—7.30	6.30—7.30	...
334	Class 3	7.35—8.35	...	...	...	7.35—8.35	...
335	Class 4	8.40—9.40	...	...	...	8.40—9.40	...
Pianoforte, Men—							
336	Class 1	...	...	6.30—7.30	...	...	4.0—5.0
337	Class 2	...	...	7.35—8.35	...	...	5.5—6.5
338	Class 3	...	...	8.40—9.40	...	...	6.10—7.10
Violin, Ladies—							
339	Class 1 and 4	6.30—7.30	6.30—7.30	...	6.30—7.30	6.30—7.30	...
341	Class 2 and 5	7.35—8.35	7.35—8.35	...	7.35—8.35	7.35—8.35	...
342	Class 3	8.40—9.40	...	...	...	8.40—9.40	...
Violin, Men—							
343	Class 1 and 2	...	6.30—7.30	6.30—7.30	6.30—7.30	...	4.0—5.0
344	Class 3 and 4	...	7.35—8.35	7.35—8.35	7.35—8.35	...	5.5—6.5
345	Class 5 and 6	...	8.40—9.40	8.40—9.40	8.40—9.40	...	6.10—7.10
348	Tonic Sol-fa	...	8.0—9.5	...	8.0—9.5	...	...
350	Irish Pipes	...	7.15—8.15	...	7.15—8.15	...	...
351	Clarinet, Class 1	6.30—7.30	...	...	...	6.30—7.30	...
352	" Class 2	7.35—8.35	...	...	...	7.35—8.35	...
353	Oboe	8.40—9.40	...	8.40—9.40	...	...	...
	Bassoon		...	...	...	...
354	Trombone	...	...	7.30—8.30	...	8.40—9.40	...
Cornet and Horn—							
356	Class 1	...	...	...	6.30—7.30	...	4.0—5.0
357	Class 2	...	...	...	7.35—8.35	...	5.5—6.5
360	Bombardon and Euphonium	...	...	...	8.40—9.40	...	6.10—7.10
362	Drums	6.30—7.30	6.30—7.30	6.30—7.30	...	6.30—7.30	...
363	Flutes, Class 1	7.35—8.35	...	7.35—8.35	...	...	...
364	" Class 2	8.40—9.40	...	8.40—9.40	...	...	...
365	" Class 3	...	7.35—8.35	...	...	7.35—8.35	...
366	" Class 4	...	8.40—9.40	...	...	8.40—9.40	...

Appendix.

PRIZES AND CERTIFICATES.

FOR COURSES OF STUDY.

On the completion of the period of the Course, on application, a Certificate will be awarded to every qualified and Certified Student who attends during the successive years any of the Technical Courses offered in this Calendar, and passes with credit the Examinations held at the end of each year.

To those who pass the Department Examinations, covering a period of 3 or 4 years, a Full Course Diploma will be awarded, in addition to a Provisional Certificate obtainable one year earlier.

To induce attendance at Courses of Study the Committee will award prizes varying in value from 5/- to 10/- to all students who obtain 66 per cent. marks in the Sessional examinations of the Schools. The amount will depend on whether the student makes 40, 60 or 80 attendances in the two or three subjects of a Course as set out in the Prospectus.

A prize, value 2/6, will be given to every Preparatory year student who makes three-fourths attendances in each subject and gets at least 66 per cent. marks in the final Examination in each subject.

PRIZES IN INDIVIDUAL SUBJECTS.

Prizes and certificates will also be awarded to students who obtain the following successes in the examinations held by the Board of Education, by the City and Guilds of London Institute, or by the Society of Arts, and who make at least three-fourths of the possible number of attendances in Class. These awards are restricted to Qualified "Technical Students" who have attended regularly one of the Authorised Courses of study.

SCIENCE.

(Examinations under Board of Education.)

1st Class Higher Examination	£1 5 0
2nd Class Higher Examination	0 17 6
1st Class Lower Examination	0 10 0
2nd Class Lower Examination	0 7 0

ART.

(Examinations under Board of Education.)

Following is the old list of rates of prizes for Art, which is quoted in the absence of definite information as to the future scheme of the Board of Education. In 1913 the prizes will be awarded, as nearly as can be judged, by this schedule

Group IV., 1st Class	£1 5 0
Group IV., 2nd Class	0 17 6
Group III., 1st Class	0 15 0
Group III., 2nd Class	0 12 0
Group II., 1st Class	0 10 0
Group II., 2nd Class	0 7 0
Group I., 1st Class	0 5 0

TECHNOLOGY.

(Examinations under City and Guilds of London).

1st Honours	£1 5 0
2nd Honours	0 15 0
1st Ordinary	0 10 0
2nd Ordinary	0 5 0
Pass Practical	0 5 0

COMMERCIAL CLASSES.

(Examinations under Society of Arts).

Stage III., 1st Class	£0 12 6
Stage III., 2nd Class	0 7 6
Stage II., 1st Class	0 6 0
Stage II., 2nd Class	0 3 6

A student having taken or shared a prize cannot compete again for such prize, or for one in a lower stage of the same subject.

NOTE.—No student is eligible for any of the following prizes who obtains less than 50 per cent. marks in examination, or has made less than 75 per cent. of the possible attendances.

PAINTERS' AND DECORATORS' WORK.

The Dublin Guild of Master Painters have given prizes value £4 on the results of an examination conducted by the Guild at the close of the session. Prizes were awarded both in Practical Work and in Theory.

These Competitions are limited to *bonâ fide* apprentices.

MACHINE CONSTRUCTION AND DRAWING.

Messrs. Kennan and Son offer a prize value 10s. to the student who makes the most improvement and the best attendance during the session in Machine Construction and Drawing Classes. Competition is limited to *bonâ fide* artisans or apprentices under 21 years of age.

BOOT AND SHOEMAKING.

Messrs. Manfield and Sons offer a prize value £1, Mr. E. J. Long offers a prize value 10s., and Messrs. E. Lenehan and Son also offer a prize value 10s. to the students who make great progress during the session.

HAIRDRESSERS' WORK.

Prizes are offered for competition amongst the students of the class by Mr. Austin Kane, M. Prost, Madam Drago, Messrs. R. Hovenden and Son (London), and Messrs. Russell and Sons.

METAL PLATE WORK.

The City of Dublin Tinsmiths and Sheet Metal Plate Workers' Society offer a prize of £1 1s. to be given on the results of the City and Guilds of London Institute's examinations for the pupils of the Metal Plate Class.

DRESSMAKING.

The Dublin Master Drapers' Association offer prizes value £3 to *bonâ fide* Dressmakers.

The Board of Education Examinations have been undergoing so much change that it seems best to refer Students to the printed Time-Table which will be posted up at Bolton Street and Kevin Street, and it would not be safe to describe even the Awards.

It may be noted, however, that the Whitworth Exhibitions and Scholarships have been awarded in competition at the Evening Science Examinations. These consist of thirty £50 Exhibitions tenable for one year, and four Scholarships of £125 a year, tenable for three years, unless altered.

CITY AND GUILDS OF LONDON INSTITUTE.

Prizes are offered for competition at the Examinations held in April and May. The Institute also offers silver and bronze medals in each subject contained in their programme.

THE ROYAL COLLEGE OF SCIENCE FOR IRELAND.

Copies of the Programme and Scholarship Scheme of the Royal College of Science will be posted in the Hall of the Schools for the information of the Students.

THE NATIONAL ASSOCIATION OF MASTER PAINTERS.

The Association, at the annual convention, holds examinations for apprentices, and offers numerous medals and money prizes. Travelling Scholarships value £50 are offered annually, and are open to all *bona-fide* apprentices.

ROYAL DUBLIN SOCIETY.

The Society, at the Art Industries Exhibition in connection with the Horse Show, offers many prizes for Craft Work, such as Wood Carving, Enamelling, Leather Work, Artistic Metal Work, Modelling for Ornamental Plaster Work.

IRISH TRAINING SCHOOL OF COOKERY AND DOMESTIC ECONOMY.

Certain Scholarships, consisting of free training, are offered annually by the Department in connection with this School.

EXAMINATIONS.

ENTRANCE EXAMINATIONS.

Before they are enrolled in Classes new applicants should be examined in English, Arithmetic and Drawing to test their general preliminary education. Satisfactory evidence of general education (*i.g.*, Certificates of Board of Intermediate Education or other examining bodies) may exempt from examination. See pages 14-15.

Entrance Examinations will be held each evening (Saturday excepted) from 18th September to 30th September.

CLASS EXAMINATIONS.

Class Examinations will be held by each teacher towards the close of the Session. Prizes are given on the results. The enrolment of a Student will be considered as an undertaking to make a sufficiently good attendance and also to sit for the Class Examination. Only Qualified Technical Students taking Authorised Courses are eligible for the Prizes.

EXTERNAL EXAMINATIONS.

The dates of the various Examinations held by the City and Guilds of London Institute, and the Society of Arts are set forth in this Appendix. Only such Students as have made sufficiently good attendances are to be entered for these Examinations.

SPECIAL NOTICES.

PUBLIC LIBRARY, LOWER KEVIN STREET.

The Public Library adjoining the Schools is equipped largely with Books and periodicals of special value to Students.

CORPORATION APPOINTMENTS.

The Corporation of Dublin have two vacancies yearly in the Electric Lighting Works for Improvers who have received a sufficient preliminary training in the Technical Schools. Students who desire to apply for these positions should notify the Teacher of the Class in Electric Lighting.

TECHNOLOGY.

Boot and Shoe Manufacture, Grade I.	April 28th	..	7 to 10 p.m.
Do. Grade II.	April 29th	..	7 to 10 p.m.
Do. Grade III. and Final	April 30th	..	7 to 10 p.m.
Telephony—Ordinary Grade	.. April 30th	..	7 to 10 p.m.
Do. Honours Grade	.. May 1st	..	7 to 10 p.m.
Telegraphy—Ordinary Grade	.. April 28th	..	7 to 10 p.m.
Do. Honours Grade	.. May 1st	..	7 to 10 p.m.
Electrical Engineering—Elementary	April 28th	..	7 to 10 p.m.
Do. 1st Paper, Ordinary	.. April 28th	..	7 to 10 p.m.
Do. 2nd Paper, Ordinary	.. April 30th	..	7 to 10 p.m.
Do. 1st Paper, Honours	.. April 28th	..	7 to 10 p.m.
Do. 2nd Paper, Honours	.. April 30th	..	7 to 10 p.m.
Wiremen's Work (Written)	.. April 29th	..	7 to 10 p.m.
Do. (Practical)	.. May 3rd	..	3 to 6 p.m.
Metal Plate Work..	.. May 1st	..	7 to 10 p.m.
Plumbers' Work (First Year)	.. April 28th	..	7 to 10 p.m.
Do. Ord. and Hons. (Written)	May 1st	..	7 to 10 p.m.
Do. Ordinary (Practical)	.. April 26th	..	2.30 to 8 p.m.
Do. Honours (Practical)	.. May 3rd	..	2.30 to 8 p.m.
Mechanical Engineering—			
Do. Ord. Grade, Part I.	.. April 29th	..	7 to 10 p.m.
Do. Ord. Grade, Part II.	.. May 1st	..	7 to 10 p.m.
Do. Honours (Written)	.. May 1st	..	7 to 10 p.m.
Typography, Preliminary	.. April 28th	..	7 to 10 p.m.
Do. Ord. and Hons. (Written)	.. April 29th	..	7 to 10 p.m.
Do. Ordinary (Practical for Compositors)	.. April 19th	..	2.30 to 7 p.m.
Lithography, First Year	.. April 28th	..	7 to 10 p.m.
Do. Ord. and Hons.	.. April 30th	..	7 to 10 p.m.
Carpentry and Joinery, Preliminary	April 28th	..	7 to 10 p.m.
Do. Ord. and Hons. (Written)	.. April 19th	..	2.30 to 6.30 p.m.
Do. Honours (Practical)	.. May 3rd	..	2.30 to 6.30 p.m.
Boilermakers' Work	.. May 1st	..	7 to 10 p.m.
Brickwork (Written)	.. April 30th	..	7 to 10 p.m.
Do. (Practical, in London)	.. May 3rd	..	1 to 8.30 p.m.
Masonry (Written)	.. April 28th	..	7 to 10 p.m.
Do. (Practical, in London)	.. April 26th	..	1 to 8.30 p.m.
Plasterers' Work	.. April 29th	..	7 to 10 p.m.
Painters' and Decorators' Work—			
Do. Preliminary (Written)	.. April 28th	..	7 to 10 p.m.
Do. Ordinary and Honours	.. April 29th	..	7 to 10 p.m.
Cabinet-making	.. April 29th	..	7 to 10 p.m.
Builders' Quantities	.. April 29th	..	7 to 10 p.m.
Tailors' Cutting (Written)	.. April 28th	..	7 to 10 p.m.
Do. Ord. Grade (Practical)	.. May 3rd	..	2.30 to 5.30 p.m.
Do. Hons. Grade (Practical)	.. May 3rd	..	2.30 to 7 p.m.
Dressmaking (Written)	.. May 1st	..	7 to 10 p.m.
Do. (Practical)	.. May 3rd	..	2.30 to 7 p.m.
Millinery (Written)	.. April 29th	..	7 to 10 p.m.
Do. (Practical)	.. April 26th	..	2.30 to 6.30 p.m.
Plain Needlework (Written)	.. April 30th	..	7 to 10 p.m.
Do. (Practical)	.. April 19th	..	2.30 to 6.30 p.m.
Plain Cookery (Written)	.. April 28th	..	7 to 10 p.m.
Do. (Practical)	.. April 26th	..	4 to 7 p.m.
Engineers' Quantities and Estimating	.. April 30th	..	7 to 10 p.m.
Structural Engineering	.. April 28th	..	7 to 10 p.m.
Heating and Ventilation, Grade I.	.. April 28th	..	7 to 10 p.m.
Do. do. Grade II.	.. April 30th	..	7 to 10 p.m.
and Final			

ROYAL SOCIETY OF ARTS EXAMINATIONS, 1913.

PROVISIONAL TIME TABLE (LIABLE TO ALTERATION).

	Monday, April 7. (7—10 p.m.)	Tuesday, April 8. (7—10 p.m.)	Wednesday, April 9. (7—10 p.m.)	Thursday, April 10. (7—10 p.m.)	Friday, April 11. (7—10 p.m.)
Advanced Stage.	Book-keeping. Précis-writing. Economics. Danish and Norwegian.	Arithmetic. Commercial Law. German. Italian. Spanish.	French. Commercial History and Geography. Typewriting. (7.30 to 10 p.m.).	Accounting and Banking. Shorthand (140 and 120 words per minute.) (7.15 to 10 p.m.)	English Portuguese. Russian. Swedish. Chinese. Japanese. Hindustani.
Intermediate Stage.	Typewriting (7.30 to 10 p.m.). French. Danish and Norwegian. Commercial History and Geography.	Book-keeping. Précis-writing.	English. Economics. Spanish. Commercial Corres- pondence and Business Training.	Arithmetic. German. Portuguese. Italian. Russian. Chinese. Japanese. Hindustani.	Swedish. Shorthand (100 and 80 words per minute), (7.15 to 10 p.m.).
Elemen- tary Stage.	Handwriting and Correspondence. French.	Commercial Geography. Typewriting, (7.30 to 10 p.m.).	Book-keeping. Spanish.	Shorthand (50 words per minute), (7.15 to 10 p.m.).	Arithmetic. German. Italian.
Music.		Harmony.	Rudiments of Music, (7 to 9 p.m.).		

The last day for receiving entries at Kevin Street is February 21st. The special subject for Commercial History and Geography is:—"Africa."

