1937

Architecture, Building and Furniture Trades: Prospectus of Courses Session 1937-38

City of Dublin Vocational Education Committee

City of Dublin
Vocational Education Committee

Scoileanna Ceárd-Oideachais
City of Dublin Technical Schools

Seisiún
1937-38

Session
1937-38

Architecture, Building and Furniture Trades

PROSPECTUS OF COURSES

BOLTON STREET :: RINGSEND

CALENDAR—SESSION 1937-38

1937—SEPT. 6, MONDAY	Whole-time Day Schools open for enrolment. Day Apprentice School resumes work.
SEPT. 13, MONDAY	Whole-time Day Schools commence work and Part-time Day Classes open for enrolment.
SEPT. 20, MONDAY	Evening Classes open for enrolment and Part-time Day Classes commence work.
SEPT. 27, MONDAY	Evening Classes commence work.
NOV. 1, MONDAY	*All Saints' Day.* Whole-time Day Schools—excepting Day Apprentice School and Special Classes—closed.
DEC. 8, WEDNESDAY	*Feast of Immaculate Conception.* Whole-time Day Schools—excepting Day Apprentice School and Special Classes—closed.
DEC. 11, SATURDAY	Teaching work in Whole-time Day Schools ceases (excepting Day Apprentice School and Special Classes).
DEC. 13, MONDAY	Term Examinations in Whole-time Day Schools commence.
DEC. 18, SATURDAY	Schools close for Christmas Vacation.
1938—JAN. 3, MONDAY	All Classes resume work after Christmas Vacation.
JAN. 6, THURSDAY	*Feast of Epiphany.* Whole-time Day Schools—excepting Day Apprentice School and Special Classes—closed.
MAR. 4, FRIDAY	Land Surveying and Levelling Course begins.
MAR. 17, THURSDAY	*St. Patrick's Day.* Schools closed.
MAR. 19, SATURDAY	Land Surveying Field Work begins. Motor Car Driving Lessons begin.
APR. 12, TUESDAY	Last meeting of classes before Easter Vacation.
APR. 20, WEDNESDAY	All classes resume work after Easter Vacation.
APR. 29, FRIDAY	Evening Classes close — excepting Special Classes.
MAY 2, MONDAY	Evening Examinations commence.
MAY 26, THURSDAY	*Ascension Day.* Whole-time Day Schools—excepting Day Apprentice School and Special Classes—closed.
JUNE 6, MONDAY	*Whit-Monday.* Schools closed.
JUNE 16, THURSDAY	*Feast of Corpus Christi.* Whole-time Day Schools—excepting Day Apprentice School and Special Classes—closed.
JUNE 25, SATURDAY	Teaching work ceases in Whole-time Day Schools—excepting Day Apprentice School and Special Classes.
JUNE 27, MONDAY	Sessional Examinations commence in Whole-time Day Schools—excepting Day Apprentice School and Special Classes.
JUNE 29, WEDNESDAY	*Feast of Saints Peter and Paul.* Whole-time Day Schools—excepting Day Apprentice School and Special Classes—closed.
JULY 2, SATURDAY	Whole-time Day Schools and Part-time Domestic Economy Classes close—excepting Day Apprentice School and Special Classes.
JULY 16, SATURDAY	Day Apprentice School and Special Classes close.

CITY OF DUBLIN VOCATIONAL EDUCATION COMMITTEE

COMMITTEE

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TECHNICAL INSTITUTE,
BOLTON STREET,
DUBLIN.

L. E. O'CARROLL, B.A., B.I.,
Chief Executive Officer.

LOCAL SUB-COMMITTEES

For triennial period 1934-37.

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MR. J. SHEERIN.
MR. SLEATOR.

MASTER TAILORS.

MR. W. O'CONNOR.
MR. W. SCOTT.
MR. R. BOYD.

TABLE OF CONTENTS

GENERAL NOTICES

Entrance Examinations, Fees, Regulations

Students, on enrolment, may be required, at the discretion of the Principal to sit for an Entrance Examination. Introductory Courses are provided for those not sufficiently qualified to enter a full Technological Course.

FEES FOR SESSION

	s.	d.	
Introductory and Preparatory Courses	2	6	
General Courses	7	6	per Course.
Additional Course Subjects	2	6	each.
Single Subjects	7	6	each.
Land Surveying and Levelling (Of approximately Twelve Weeks).	10	0	for Course.

Fees cannot be refunded.

Students who through obtaining employment are unable to continue in attendance at the Whole-time Day School Courses of the City of Dublin Vocational Education Committee will be admitted to approved evening school courses, without fees, up to the value of the Day School Fees paid.

The same concession may be extended to other students who have left the Day School Courses, if the reasons for their non-attendance at the Day School Classes are considered by the Principal to be adequate.

Applicants for admission to Courses or Classes must be at least fourteen years of age.

The Trade Classes are primarily intended for those engaged in the several trades. Others will not be admitted before November 5th, 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 continue in a Laboratory or Workshop Class if his attendance at the Lecture or Drawing Class is unsatisfactory.

A Class may be discontinued if an insufficient number of students join or attend; the number of evenings allotted weekly to a Class may be reduced if there be a falling off in the attendance. The right is reserved to close Classes for any other reason whatever.

Students must make good any damage done by them.

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

A complete course of study in any section generally occupies about three years.

Where possible, separate classes for journeymen will be arranged in trade subjects.

The Courses as set out are not to be considered as arbitrary, the subjects may, with the sanction of the Principal, be varied to suit the needs of individual applicants.

Special Day Courses are provided for those actually engaged in trades—arrangements being made with employers whereby their apprentices can attend the School six or more hours weekly.

SCHOOL CHOIRS AND DRAMATIC CLASSES.

The Committee is prepared to facilitate the organisation of Choral and Dramatic Societies and similar activities. Students interested are invited to communicate with the Principal of the Institute in which they are enrolled.

SCHOOLS OF

Architecture, Building and Furniture Trades

AT

TECHNICAL INSTITUTES

BOLTON STREET
AND RINGSEND

Technical Institute, Bolton Street

TEACHING STAFF

WILLIAM DAVIDSON, F.R.I.C.C., *Principal.*

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J. J. McKEOWN.
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W. J. KEIRAN.

BOLTON STREET.

DAY APPRENTICE SCHOOL, COURSES IN :—

BRICKWORK, PLUMBING .., PAINTING .. } about 30 hours weekly. See separate Time Table.

Special Afternoon Classes for Apprentice Painters—Mon., Tues., Wed., Thurs., 2 to 5 p.m.
" " " " " **Plumbers**—2 to 5 p.m. on Wed.
" " " " " **Carpenters**—Mon., Tues , Wed., Thurs., 2.15 to 5.15 p.m.

Day Course in Building Science, about 25 hours per week. See separate Time Table.

EVENING SCHOOL COURSES.

INTRODUCTORY COURSE

No of Course.	SUBJECT	Day	Hour	Room	TEACHER	No. of Syllabus
100B	Workshop Arithmetic—C ...	Mon.	7.30-8.30	C 20	W. J. O'Brien	157
	English—C ...	Mon.	8.30-9.30	B 20	W. J. O'Brien	156
	Building Drawing—A ...	Tues.	7.30-9 30	B 20	R. E. Fee	158

GENERAL BUILDING COURSES

For Architects, Civil Engineers, Clerks of Works, Builders and others

The First and Second Year Courses cover the work of the Dept. of Education Elementary Stage Examinations (See Department of Education Technological Certificate Course Exams. Programme)

	FIRST YEAR.					
101B	Building Construction—I. A.	Wed.	7.30-9.30	B 17	J. F. Cleary	6
	Practical Mathematics—I. A.	Thurs.	7.30-9.30	C 7	H. C. Clifton	7
	Practical Geometry—I. A.	Tues.	7.30-9.30	B 17	J. F. Cleary	8
	SECOND YEAR.					
102B	Building Construction—II. ..	Wed.	7.30-9.30	B 10	A. E. Williams	9
	Geometry, Mathematics and Mechanics	Thurs.	7.30-9.30	B 26		10

The Third and Fourth Year Courses cover the work of the Dept. of Education Intermediate Stage Examinations

	THIRD YEAR.					
	Building Construction—III. ..	Thurs.	7.30-9.30	B 10	A. E. Williams	11
103B	Applied Mechanics—III. or	Wed.	7.30-9.30	B. 26		12
	Builders' Quantities—Inter.	Mon.	7.30-10.0	B 26	M. J. Burke	151
	FOURTH YEAR					
	Building Construction—IV ..	Thurs.	7.30-9.30	B. 10	A. E. Williams	13
104B	Applied Mechanics —IV. or	Wed.	7.30-9.30	B. 26		14
	Builders' Quantities Inter.	Mon.	7.30-10.0	B. 26	M. J. Burke	151

The Fifth Year Course covers the work of the Dept. of Education Advanced Stage Examinations

	FIFTH YEAR.					
	Building Construction—V. ..	Thurs.	7.30-9.30	B. 10	A. E. Williams	15
105B	Applied Mechanics—V. or	Wed.	7.30-9.30	B. 26		14
	Builders' Quantities—Adv. ..	Mon.	7.30-10.0	B. 26	J. M. Burke	151

BOLTON STREET.

CABINET-MAKERS' COURSE.

(See Dept. of Education Trade Certificate Course Exams. Programme)

No. of Course	Subject	Day	Hour	Room	Teacher	No. of Syllabus
	FIRST YEAR.					
129B	Cabinet-making, Lecture and Drawing—I.	Fri.	7.30-9.30	B 11	M. Murray.	65
	Cabinet-making, Pract.—I. ..	Thurs.	7.30-9.30	B 11	M. Murray.	66
	SECOND YEAR.					
130B	Cabinet-making, Lecture and Drawing—II.	Wed.	7.30-9.30	B 11	M. Murray.	67
	Cabinet-making, Pract.—II. ..	Mon.	7.30-9.30	B 11	M. Murray.	68
	THIRD YEAR.					
131B	Cabinet-making, Lecture and Drawing—III.	Wed.	7.30-9.30	B 11	M. Murray.	67
	Cabinet-making, Pract.—III.	Tues.	7.30-9.30	B 11	M. Murray.	68
	FOURTH YEAR.					
132B	Cabinet-making, Lecture and Drawing IV.	Wed.	7.30-9.30	B 11	M. Murray.	67
	Cabinet-making, Practical ..	Tues.	7.30-9.30	B 11	M. Murray.	68

COURSE IN UPHOLSTERY.

	FIRST YEAR.					
135B	Upholstery, Theory and Practice	Mon., Wed.	7.30-9.30	D 16	T. Roche	76
	SECOND YEAR.					
136B	Upholstery, Theory and Practice	Mon., Wed.	7.30-9.30	D 16	T. Roche	76
	Measuring and Outdoor Fixing	Thurs.	7.30-9.30	D 16	T. Roche	76
	THIRD YEAR.					
137B	Upholstery, Theory and Practice	Mon., Wed.	7.30-9.30	D 16	T. Roche	76
	Measuring and Outdoor Fixing	Thurs.	7.30-9.30	D 16	T. Roche	76
	FOURTH YEAR.					
138B	Upholstery, Theory and Practice	Mon., Wed.	7.30-9.30	D 16	T. Roche	76
	Measuring and Outdoor Fixing	Thurs.	7.30-9.30	D 16	T. Roche	76

WOOD-CARVING.

	FIRST YEAR.					
140B	Wood-carving, Lecture and Drawing—I.	Mon.	7.30-9.30	B 14	J. Levins.	82
	Wood-carving, Practical—I. ..	Tues.	7.30-9.30	B 14	J. Levins.	82
	Mechanical Drawing and Design —I.	Fri.	7.30-9.30	C 20	R. Grimes	82
	SECOND YEAR.					
141B	Wood-carving, Lecture and Drawing—II.	Mon.	7.30-9.30	B 14	J. Levins.	82
	Wood-carving, Practical—II.	Tues.	7.30-9.30	B 14	J. Levins.	82
	Design—II	Fri.	7.30-9.30	C 20	R. Grimes	82

BOLTON STREET.

No. of Course	Subject	Day	Hour	Room	Teacher	No. of Syllabus
	THIRD YEAR.					
142B	Wood-carving, Lecture and Drawing—III.	Mon.	7.30-9.30	B 14	J. Levins.	82
	Wood-carving, Pract.—III. ..	Tues.	7.30-9.30	B 14	J. Levins.	82
	Design—III	Fri.	7.30-9.30	C 20	R. Grimes	82

FRENCH POLISHING COURSE.

(Including Spray Polishing)

	FIRST YEAR.					
145B	French Polishing, Theory and Practice	Mon.	7.30-9.30	B 23		90
	SECOND YEAR.					
146B	French Polishing, Theory and Practice	Fri.	7.30-9.30	B 23		90

COACH AND MOTOR BODY BUILDERS COURSE.

	FIRST YEAR.					
150B	Coach and Motor Body Building —I. (Lect. and Drawing) ..	Tues.	7.30-9.30	B 13	H. Dempsey	95
	Do. (Practical) ..	Fri.	7.30-9.30	B 13	H. Dempsey	95
	SECOND YEAR.					
151B	Coach and Motor Body Building —II. (Lect. and Drawing) ..	Wed.	7.30-9.30	B 13	H. Dempsey	95
	Do. (Practical)	Thurs.	7.30-9.30	B 13	H. Dempsey	95
	THIRD YEAR.					
152B	Coach and Motor Body Building —III. (Lect. and Drawing)	Wed.	7.30-9.30	B 13	H. Dempsey	95
	Do. (Practical)	Thurs.	7.30-9.30	B 13	H. Dempsey	95

BOLTON STREET.

COACH PAINTING AND PAINTSPRAYING.

No. of Course	Subject	Day	Hour	Room	Teacher	No. of Syllabus
	FIRST YEAR.					
160B	Coach Painting—I. (Pract.) ..	Thurs.	7.30-9.30	B 23	R. McNamara	115
	Do (Drawing and Lettering)	Tues.	7.30-9.30	B 23	R. McNamara	115
	SECOND YEAR.					
161B	Coach Painting—II. (Pract.) ..	Thurs.	7.30-9.30	B 23	R. McNamara	115
	Do. (Drawing and Lettering)	Tues.	7.30-9.30	B 23	R. McNamara	115

SPECIAL CLASS FOR JOURNEYMEN

162B	Paint Spraying	Wed.	7.30-9.30	B 23	R. McNamara	115

COACH TRIMMING.

	FIRST YEAR.					
164B	Coach Trimming	Mon.,Wed.	7.30-9.30	D 18	G. O'Keeffe	122
	SECOND YEAR.					
165B	Coach Trimming	Mon.,Wed.	7.30-9.30	D 18	G. O'Keeffe	122

WOODCUTTING MACHINISTS' COURSE.

	FIRST YEAR.					
170B	Woodcutting Machinery—I. (Practical)	Mon.	7.30-9.30	C 18	C. Kenny.	127
	Woodcutting Machinery—I. (Drawing)	Tues.	7.30-9.30	B 26	C. Kenny.	127
	SECOND YEAR.					
171B	Woodcutting Machinery—II. (Drawing)	Tues.	7.30-9.30	B 26	C. Kenny.	127
	Woodcutting Machinery—II. (Practical)	Thurs.	7.30-9.30	C 18	C. Kenny.	127
	THIRD YEAR.					
172B	Woodcutting Machinery—III. (Drawing)	Fri.	7.30-9.30	B 26	C. Kenny.	127
	Woodcutting Machinery—III. (Practical)	Wed.	7.30-9.30	C 18	C. Kenny.	127

BRICK AND STONELAYERS' COURSE.

(See Dept. of Education Trade Certificate Course Exams. Programme)

	FIRST YEAR.					
174B	Bricklaying (Practical) ..	Tues.	7.30-9.30	C 17	E. Byrne	135
	Bricklaying (Drawing and Theory)	Fri.	7.30-9.30	B 10	E. Byrne	136
	SECOND YEAR.					
175B	Bricklaying (Practical) ..	Thur.	7.30-9.30	C 17	E. Byrne	137
	Bricklaying (Drawing and Theory)	Mon.	7.30-9.30	B 10	E. Byrne	138

BOLTON STREET.

No. of Course	Subject	Day	Hour	Room	Teacher	No. of Syllabus
	THIRD YEAR.					
176B	Bricklaying (Practical) ..	Thurs.	7.30-9.30	C 17	E. Byrne	139
	Bricklaying (Drawing and Theory)	Mon.	7.30-9.30	B 10	E. Byrne	140
	FOURTH YEAR.					
177	Brickwork Drawing	Wed.	7.30-9.30	B 1	E. Byrne	

STONECUTTING COURSE

	FIRST YEAR					
179	Stonecutting, Drawing and Theory ..	Tues.	7.30-9.30	B 10		143
180	Stonecutting, Practical	Thurs.	7.30-9.30	D 18		143

MISCELLANEOUS CLASSES.

*Class A	Land Surveying and Levelling. (See note below.)			C 8	A. M. McLoughlin.	150
,,	E Manual Instruction (Wood) ..	Mon.	7.30-9.30	B 11	J. J. McKeown	153
,,	E Mech. Drawing and Design ..	Fri.	7.30-9.30	C 20	R. Grimes	154
,,	F Manual Instruction (Wood) ..	Thurs.	7.30-9.30	B 12	J. J. McKeown	153
,,	F Mech. Drawing and Design ..	Mon.	7.30-9.30	B 24	W. J. Keiran	154
,,	G Manual Instruction (Wood) Advanced	Wed.	7.30-9.30	B 12	J. A. Clarke	153
,,	H Manual Instruction (Wood) ..	Tues.	7.30-9.30	B 12	J. J. McKeown	
,,	J Mech. Drawing and Design ..	Mon.	7.30-9.30	B 24	W. J. Keiran	154
,,	L Plan Drawing and Reading ..	Mon.	7.30-10.0	B 17	J. F. Cleary	158

SPECIAL CLASSES IN IRISH.

	Irish—I.A.	Mon.	7.30-9.30	C 2	D. S. MacEoin	159
	Irish—I.B.	Thurs.	7.30-9.30	C 2	D. S. MacEoin	159

* This Class will start in March, 1938.

TECHNICAL SCHOOL
RINGSEND

MARTIN KEADY, B.E., B.SC., A.R.C.SC.I., *Principal.*

TEACHING STAFF

W. H. STURDY, (Full Technological Certificates—City and Guilds of London Institute).

B. DEVLIN, B.SC. (Eng.) Lond., A.R.C.SC.I.

I. LAMBERT, B.SC. (Hons.), H.DIP.ED.

P. J. O'HAGAN.

TIME TABLE AND COURSES

BUILDING CONSTRUCTION COURSE.

FIRST YEAR				
Building Construction	Wednesday ..	7.30–9.30	W. H. Sturdy ..	7
Practical Mathematics	Thursday	7.30–9.30	P. J. O'Hagan ..	6
Practical Geometry	Tuesday	7.30–9.30	P. J. O'Hagan ..	8
SECOND YEAR.				
Building Construction	Wednesday ..	7.30–9.30	W. H. Sturdy ..	9
Practical Geometry	Tuesday	7.30–9.30	P. J. O'Hagan ..	10
Mechanics	Friday	7.30–9.30	I. Lambert ..	10
Practical Mathematics	Friday	7.30-9.30	P. J. O'Hagan	10

CARPENTRY AND JOINERY COURSE.

FIRST YEAR.				
Carpentry and Joinery (Practical) ..	Monday	7.30–9.30	W. H. Sturdy ..	18
Practical Mathematics	Thursday	7.30–9.30	P. J. O'Hagan ..	7
Practical Geometry	Tuesday	7.30–9.30	P. J. O'Hagan ..	8
SECOND YEAR.				
Carpentry and Joinery (Practical) ..	Monday	7.30–9.30	W. H. Sturdy ..	22
Carpentry and Joinery (Drawing and Lecture)	Thursday	7.30–9.30	W. H. Sturdy ..	23
Practical Mathematics	Friday	7.30-9.30	P. J. O'Hagan	10

HANDICRAFT (MANUAL INSTRUCTION) COURSE.

FIRST YEAR.				
Manual Instruction (Wood)	Tuesday	7.30–9.30	W. H. Sturdy ..	153
Woodwork Drawing	Thursday	7.30–9.30	W. H. Sturdy ..	153
SECOND YEAR.				
Manual Instruction (Wood)	Tuesday	7.30–9.30	W. H. Sturdy ..	153
Woodwork Drawing	Thursday	7.30–9.30	W. H. Sturdy ..	153

PHYSICAL TRAINING.

Town Hall, Ballsbridge.

Physical Training (Men)	Wednesday ..	8–10	E. Chandler ..	

ARCHITECTURE and BUILDING TRADES

SYLLABUSES

EVENING SCHOOL

BUILDING CONSTRUCTION. I.

In this class the student will be familiarised with the more common building materials. Practice in freehand pictorial sketching of building details will be given, and students will be required to make therefrom proper working details to scale.

During the session occasional visits will be paid to buildings in course of erection for the purpose of examining and sketching details of construction.

6. *Concrete* : Examples of the use of Concrete in foundations, dwarf and rising walls, drain beds, door and window sills and copings.

Foundations : Foundations and footings in ordinary soils—damp-proof courses. *Brickwork* : simple bonds of brickwork in plain walling—sleeper walls—segmental and semi-circular gauged arches—various kinds of bricks, and the purposes for which each is fitted. *Masonry* : varieties of rubble and ashlar walling—plain work on sills—wall copings—characteristics of sandstones and limestones. *Carpentry and Joinery* : single floors—trimming around well-holes and fireplaces—stud partitions—ordinary roofs, including king-posts trusses—construction of ledged and braced 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* : terms used in slater's work—cutting and fixing of slates—treatment at eaves and ridges. *Plumbing* : lead gutters and flashings. *Plastering* : composition of various coats of plaster—ordinary lathing and plastering of internal walls, ceilings, and partitions.

TEXT BOOK.—C. F. Mitchell : Elementary Building Construction and Drawing.

PRACTICAL MATHEMATICS. I.

7. Approximate calculations—fractions—areas of triangle, rectangle, parallelogram, trapezium, irregular quadrilateral, etc.—evaluation of formulæ—algebraic symbols—rules as algebraic formulæ—mensuration of the circle, prism, cone, cylinder, pyramid—easy simple equations—transposing formulæ—square root—the right-angled triangle, sine, cosine, and tangent of an angle and use of tables—percentages—averages—graphs—areas of irregular curved figures and average values by mid-ordinate rule—Graphical statics—the triangle and polygon of forces—simple problems on forces acting at a point—stresses in simple frames—parallel forces—simple cases only, such as determination of the reactions of supports of a loaded beam.

PRACTICAL GEOMETRY. I.

8. Construction and use of scales—plotting of angles by protractor or trigonometric tables—division of lines in giving proportions—measurement of angles in degrees—sine, cosine and tangent of an angle—their values by graphical methods—construction of a triangle from given data—location of points by rectangular co-ordinates—construction of polygons—similar figures—enlarging and reducing figures by radial projection—areas of triangles, polygons and curved figures—construction of circles from specified data—tangents—angles in a segment—methods of defining positions in space, of points, lines and planes—horizontal and vertical traces—inclinations of lines and planes to planes of projection—prisms and pyramids—the regular tetrahedron—the sphere—the right circular cylinder and cone—plans, elevations and sections of these solids.

BUILDING CONSTRUCTION. II.

The instruction in the second year will give a more extended knowledge of the subjects dealt with in the first year syllabus, including the following :—

9. *Concrete* : Reinforced Concrete in floors, lintels, walls and roofs.

Foundations : Precautions 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* : bonding in junction of walls at right angles, in fireplaces and flues—finishing of chimney stacks—hollow walls and

methods of bonding them—construction of flat, elliptical and pointed arches—corbelling. *Masonry*: stone dressings—joints and fastenings in stonework—string courses and cornices—corbelling, arches—well-known building stones, quarrying, cutting, etc. *Carpentry and Joinery*: double floors—centres for segmental and circular arches to 15ft. span—" Flitch " beams—queen-post and composite roof up to 40-ft span—preparing flat roof for plumbing—box and taper gutter—trimming around skylights, chimneys, etc.—self-supporting wood partitions—doors in hard and soft woods—methods of finishing panels, framed and panelled jamb linings—vestibule doors and frames—French casement windows—pivot-hung windows—skylights—dog-leg and open newel stairs with trimmings. *Slating*: roof coverings, methods of fixing. *Plumbing*: leadwork on roofs, gutters and flats, with rolls, drips, etc.—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 of drains by smoke and by water. *Plastering*: plasterers' work of all kinds, with knowledge of composition of materials used. *Painting and Glazing*: properties and qualities of pigments, varnishing, oils and other materials used in house painting and window glazing.

TEXT BOOK.—Mitchell: Advanced Building Construction.

GEOMETRY, MATHEMATICS AND MECHANICS.

10. Areas of irregular plane figures by squared paper—mid-ordinate rule and Simpson's rule—mensuration of geometrical solids—volumes and weights of girders, floors, roof coverings—amount of excavation in trenches for walls—volume of concrete in foundations, etc.—more difficult examples in plane geometry—construction and chief characteristics of the ellipse—further examples of plans, elevations and sections of solids—development and interpenetration—general problems on lines and planes—intersecting planes and the angle between them, with practical applications—parallel and perpendicular lines and planes—dihedral angle.

Graphical statics—the triangle and polygon of forces—stresses in frames—parallel forces—reactions of supports—units of force—measurement of force—composition and resolution of forces—moments of couples—centre of gravity and stability.

BUILDING CONSTRUCTION. III.

In this year of the Course the student will obtain a wider knowledge of the subjects already dealt with. More time will be given to the making of finished drawings. Colouring, tracing and inking-in will receive some attention.

11. *Drawing*: inking-in, tracing, colouring and lettering of drawings. *Concrete*: in floors, walls, beams, piers and columns. Methods of reinforcing, shuttering and forms. Materials and Specifications. *Foundations*: natural and artificial foundations upon land and under water — timbering for excavations — damp sites and their treatment. *Brickwork*: bonds of all kinds—composite walls—retaining walls—ornamental construction in brickwork—sewer construction—brick manufacture—terra cotta and artificial stones—their manufacture and uses. *Masonry*: various kinds of stones—their characteristics and chemical composition and suitability for different climatic conditions—construction of tracery windows—arches—stone stairs. *Carpentry and Joinery*: shoring and underpinning—scaffolding and staging—gantries and derrick towers—temporary building and half-timber work—centres for arches, and methods employed to fix and ease them—open timber and other forms of roof trusses—dormers—turrets—window frames and sashes of all kinds—shutters—lantern lights—shop fronts—planning and construction of stairs—timber: characteristics, defects, conversions, modes of seasoning, causes of decay, and means of preservation. *Plumbing and Sanitary Work*: domestic hot and cold water supply—baths, lavatories, sinks and w.c. fittings—waste pipes, soil pipes and ventilating pipes—sewage disposal for an isolated house—manufacture of lead and its general uses. *Ironwork and Fireproof Construction*: modern roof trusses up to forty-five feet span—steel joists and stanchions—fireproof construction in floors, roofs and stairs.

TEXT BOOK.—Mitchell: Advanced Building Construction.

APPLIED MECHANICS. III.

12. Revision of the Second Years' work on moments, couples and centres of gravity—efficiency of machines—graphic statics—Bow's notation—space and force diagrams—link polygons for parallel and non-parallel forces—further consideration of stresses in frame structures, such as roof trusses up to 45ft. span

—dead load and wind pressure diagrams— diagrams for structures not in one plane, such as are required for the stresses in shear legs, derrick cranes, etc.—stress and strain—elastic limits—elastic constants—working stresses—factors of safety—the testing of materials by compression, tension and bending—concentrated and distributed loads on beams and cantilevers—shearing force and bending moment diagrams—the use of vector and link polygons in determining shear forces and bending moments—theory of simple bending—distribution of stress intensity—moment of resistance—application of formulæ for moments of intertia—section modulus—strength of beams of standard sections—combined bending and direct stress—common examples of eccentric loading—pillars and application of well-known formulæ—various forms of stanchions and built-up struts—the use of manufacturers' pocket-books in the choice of sections for beams and struts, stanchion bases and caps, connections for roof trusses, etc.

BUILDING CONSTRUCTION. IV.

13. House planning—production of complete drawings of a small building with simple specifications and such working drawings as are usually supplied to a builder—heating systems—ventilation—methods of house sewage disposal in town and country—gas and electric lighting in their relation to building work—fireproof floors—steel-work generally—the manufacture, characteristics and general uses of all classes of building materials and the tests applied to ascertain their behaviour under various conditions—reinforced concrete work in stairs of various kinds.

APPLIED MECHANICS. IV.

14. Various types of roof trusses and spans for which they are suitable—determination of stresses by the method of sections—design of roof truss members—outline of design of plate or braced girder of uniform depth—calculations for deflection of a beam under specified conditions of loading—permissible deflection—camber—columns under eccentric and central loads—design of long struts in braced structures—simple calculations relating to masonry dams, retaining walls, piers and buttresses, foundations, small span arches, chimney—safe pressure on foundations in different classes of earth—distribution

of pressure—resultant pressure in retaining walls—the importance of wind pressure in lofty structures—reinforced concrete calculations.

BUILDING CONSTRUCTION. V.

15. Ferro-concrete beams and floors, roofs, columns, chimneys, retaining walls, tanks, conduits, bridges, piles, etc., and calculations thereon—various well-known systems of ferro-concrete construction and their relative advantages—practical details concerning ferro-concrete work—materials and specifications. Tests of cements and other building materials—road construction.

CARPENTRY AND JOINERY (PRACTICAL). I.

18. Examples to suit students' abilities will be chosen. The necessary tools will be provided by the Schools.

CARPENTRY AND JOINERY (PRACTICAL). II.

22. Examples to suit the students' abilities will be chosen.

CARPENTRY AND JOINERY (DRAWING AND LECTURE). II.

23. Choice and preparation of scales—plans and elevations, including sections—examples of joints and fastenings—oblique and isometric projection of common joints—simple forms of centres, turning pieces, rib centres; segmental and elliptical—common floor joisting—common floor coverings—trimming around chimney breasts and well-holes—couple roof—collar brace roof—king-post truss—setting out the commoner forms of mouldings—door frames and jamb linings—doors; braced and sheeted, four panelled—casement frame—sash frame and sashes—skirtings, grounds and fixing—growth and structure of timber, conversion, seasoning, etc.—tools, mechanical principles involved.

TEXT BOOK.—Carpentry and Joinery: Wilson.

CARPENTRY AND JOINERY (PRACTICAL). III.

24. Examples to suit students' abilities will be chosen.

In the subsequent years of the Course the Calculations and Geometry will be of the same practical nature, but of a more advanced type.

TEXT BOOK.—Bennett: Technical Plumbing.

PLUMBERS' WORK (PRACTICAL). I., II., III. AND IV.

31. Straightening sheet lead and tin, lead pipes, etc.—preparation of seams for soldering sheet lead and tin—soldering sheet lead with fine, tinman's, and plumbing solder—preparation of solder, soil, etc.—preparation of joints for soldering with iron, blowpipe and plumbing metal—joint making (copper bit, blowpipe, plumbing)—caulking joints with lead and rust cement—joints of earthenware and stoneware pipes—lead working into various forms—pipe fixing—pipe bending—lead burning.

An exhibition of students' practical work will be held at close of the Session.

PHYSICS AND CHEMISTRY FOR PLUMBERS. I.

This subject is of the greatest importance to Plumbers, and forms part of the First Year Course.

32. *General Properties of Matter*: measurement of length, area and volume—determination of density—measurement of force—centres of gravity—the lever—the principle of work. *Fluid Pressure*: nature and modes of measurement of pressure of liquids and gases—variation of pressure with depth in liquids—atmospheric pressure—the barometer—Boyle's Law—the principles of physics in connection with water supply, pumps and syphonic action. *Heat*: expansion of solids, liquids and gases—temperature and thermometers—heat as a quantity—the calorie and the therm—thermal capacity and specific heat—change of state—melting and boiling points—latent heats of fusion and vaporisation—change of volume resulting from change of state—the spheroidel condition and the physics of fluxes—convection, conduction and radiation. *Chemistry*: oxidation—reduction—composition of water and its action on metals—acids and salts—hydrochloric acid and "killed spirit"—elementary chemistry of lead, iron, zinc, tin and copper—composition and properties of red lead, litharge, white lead, etc., and cements made from them.

This Course will be found suitable for those applying for Certificate of Registration.

PLUMBERS' WORK (LECTURE AND DRAWING). II.

33. *Properties and Uses of Materials*: relative strengths, under various pressures, of lead, cast iron, wrought iron and copper tubes—nature and uses of seamless lead pipes, tin and tin-lined pipes, sheet lead pipes, and method of joining. *External Roof Work*: covering of flats, gutters, cesspools, dormers, skylights, etc.—principles of jointing sheet lead by rolls, welts, drips and passings—development of surfaces—making of working drawings. *Hot Water Apparatus*: principles of hot water circulation for domestic and other purposes—cylinder and tank systems—boilers and taps—material used in valve seatings, packing, etc., systems in use for prevention of furring of pipes and boilers. *Sanitary Appliances*: water closets, their fittings and supply—water-waste preventers—baths, lavatories, sinks, etc.—traps—momentum, waving out, and syphonage of traps and methods of preventing same—house cisterns, their construction and fitting—traps, pipes, fittings and other materials used in house drain construction. *Mechanical Appliances*: the multiplication of power by water pressure, as illustrated by hydraulic press—pumps—construction and uses of different kinds of pumps—hydraulic ram, etc.

TEXT BOOK.—S. S. Hellyer: Principles and practice of Plumbing, or W. P. Buchan: Plumbing.

BOOK OF REFERENCE.—W. R. Maguire: Domestic Sanitary Drainage and Plumbing.

Students will find the instruction given in this Course suitable for the Final Examination of the City and Guilds of London Institute, and for the Examination of the Royal Sanitary Institute.

PLUMBERS' WORK (LECTURE AND DRAWING). III.

34. *Water*: sources, properties, qualities; deep and shallow wells, springs—storage, filtration and distribution—pollution; causes and prevention—quantity per head for private purposes—rain fall—flow of water in channels and pipes—calculations of velocities. *Hot Water and Heating*: method of obtaining large supplies—heating buildings by hot water and steam—high and low pressure systems—sizes of

means of symbols—surface areas and volumes of cubes and rectangular prisms—measurement of cylinders, cones and spheres, all similarly expressed by symbols—exercises on wages, income and expenditure, simple trade accounts, rates, insurance, methods of measuring plastering trade quantities. *Elementary Drawing*: Freehand sketches from models—making dimensioned sketches of simple objects and details of plaster work—preparing working drawings from such sketches or from sketches supplied—simple problems in plane and solid geometry, with applications to plasterers' work. *Science and Materials*: simple mechanics, with illustrations on stability and on use of hoisting appliances—materials used in plastering, their properties and uses—simple experiments to illustrate the chemical changes which take place during the manufacture and use of plastering materials—the various limes used in candidate's neighbourhood and elsewhere—rich and poor limes—methods of making, slaking and testing limes and of making mortar for various purposes—plaster of Paris, its nature, origin, preparation and methods of use—nature of plaster substitutes, Keen's, Parian, Sirapite, and asbetic plasters, and the special purposes for which each is used—reasons for the defects which arise where these plasters are improperly used—natural and artificial cements, their properties and use for external and internal purposes—gauging, testing and using Portland, Roman, Medina, white and slag cements—mixtures of limes, plaster and cements—the purposes and methods of such admixtures with the dangers arising therefrom—other materials used in plastering, sands, hair, laths, oil, mastic, and water-proofing compounds.

Tools used—various limes and suitability for different work—sands: preparation and admixture with limes and cements—substitutes for sands—lathing internal walls, ceilings and partitions—preparation of bracketing for plasterers' work—preparing brick and stone walls for plaster—fibrous plaster—Portland cement—Keen's, Parian, Adamant, Marbalite, Sirapite and other cements—cast concrete work—mixing, tempering and manipulating—cutting moulds—moulding and casting in plaster wax, gelatine, sulphur and Phelp's metal—piece moulding—moulding from life—moulding from high-relief and the round—Scagliola making and polishing—materials, quantities and manipulations for Sgraffito work—pouncing, cutting and clearing out—gesso, composition, carton-pierre, fibrous plaster, plain face and fibrous slabs—modelling in clay, plaster, stucco, gesso

and cement—description and drawing of observed examples of work. *Quantities and Estimating*: Measuring plaster work, quantities of materials required for given areas, simple bills of quantities of plaster work, methods of estimating for plastering work.

MODELLING. II., III. AND IV.

A systematic introduction to modelled industrial design for expression in relief, in clay, plaster, cement, lead, brass, wood, etc. The work will include:

44. Management of clay—proper consistency—slab making—Sinking forms (Lead repousse) cutting clay to measurement (letters cement. Greek key patterns). Modelling from simple casts. Modelling from ornament necessitating the use of tools. Study of planes of relief. Modelling of architectural features, mouldings, etc., including ornamental detail. Manipulation of Plaster of Paris, and making simple waste moulds and casts therefrom.

PAINTERS' AND DECORATORS' WORK. I.

57. Object in painting surfaces—principles underlying the use of paints—names, description and uses of brushes and other tools—care and preservation of these—the principal pigments, thinners and driers used in painting. *Preparation of Grounds for Painting*: stopping, filling up, and surfacing. *Plain Painting*: simple mixing and application. *Distemper*: composition, application and preparation of grounds—graining and the preparation of grounds. *Sign Writing and Lettering*: principal styles of lettering and their forms and names—setting out of simple signs—dimensions of paper-hanging—preparation of pastes—the preparation of walls—stripping and hanging of ordinary papers.

TEXT BOOK.—Ellis Davidson: House Painting, Graining, Marbling and Sign Writing for all Classes.

DRAWING AND DESIGN. I., II., III. AND IV.

58. Designs for friezes, dado borders, string courses, pilasters, panels, corner pieces, breaks, centres, diapers—heraldic devices—ornamental

lettering, short texts to scale—drawings for imitation of inlaid woods and marbles—rough sketches for schemes of decoration—scales and working drawings for schemes of decoration—working out sketches with measurements taken from existing buildings and setting to given scale—drawing of historic ornament—sketches of Lunette, Cartouche.

PAINTERS' AND DECORATORS' WORK. II.

59. Faults in painting and their avoidance—preservative and decorative aspects of painters' work—economy in working—cleanliness in working—composition of, and the material used in, painters' brushes—use of plant and appliances—oils and dilutents: the properties, qualities and uses—driers: their composition, nature and action—permanence and fugacity of pigments—washable and firm distempers—water paints; limitations—selection of papers for walls and ceilings—setting out for and hanging relievo materials—artistic use of graining and marbling—grounds and methods of working—graining of different woods: oak, walnut, etc.—notice and advertising lettering—elaboration and emphasising of lettering, flatting, enamelling, etc.—woods suitable for staining—preparation and application of stains—faults in varnishing and their cure—mixed tints and colours—general hints on paint mixing.

PAINTERS' AND DECORATORS' WORK. III and IV.

60. Selection of plant and tools for jobs, the testing of steps, ladders, etc.—arrangement of scaffolding for painters—testing colours. pigments, oils, turpentine and driers—quantities for given work—action of successive coats of paint upon preceding coats—arrangements of men when painting large surfaces—painting ornament, and gilding on distemper—use of distemper on other than plaster grounds—stencilling—punctuation, gilding and preparation of grounds, etc., for sign-writing and lettering—use of imitative effects of material and texture such as bronze, ivory, etc.—representation of inlays, marqueterie, etc.—polychromatic stencilling—matt and burnish gilding, etc.—chemical staining—preparation of stain—comparative value of water, oil and spirit staining—colour values and qualities—how to decide a colour scheme—selection and hanging of special papers, such

as textile fabrics, imitation leather, Japanese grass cloth and relief materials. Measurement of painter's work, quantities and pricing.

61. *More extended Course on the Syllabus for Third Year.*

CABINET-MAKING (DRAWING AND LECTURE). I.

65. Nature and properties of various kinds of wood used in cabinet-making, with ports or places from which they are obtained—most suitable woods for construction—groundwork and veneers—best methods of seasoning and preparing for use—cabinet-making tools—names and uses—plain joints: dowelling, tongueing, dovetailing—methods of setting out and constructing mouldings; different names—preparation of working drawings—veneering surfaces—proper use of veneer—preparation of grounds and veneers, with methods of making wood stand after veneering—cabinet brass-work; hinges, joint stays, bolts and locks—methods of fixing and their different advantages—methods of measuring and setting out shaped window seats, cornice poles and drapery laths—hints with regard to the fitting up and completion of furniture for the showroom.

TEXT BOOK.—Bitmead: Cabinet-making.

CABINET-MAKING (PRACTICAL). I.

The Class forms part of the Course and must be taken in conjunction with the Drawing and Lecture Class in Cabinet-making.

The object of this Class is to afford the Student an opportunity of applying in a practical manner the knowledge gained at the theoretical and drawing lessons.

66. *Tools*: principles underlying their construction—proper method of sharpening and using—making of joints as used in cabinet work, including dowelling, tongueing, dovetailing—construction of simple mouldings by hand—preparation of machine-made mouldings for the polisher. *Veneering*: preparation of groundwork—veneering with caul and hammer, including rails and panels in straight and

curved work, cross-banding circular rims, cleaning up veneered surfaces—proper methods of affixing hinges, joint stays, bolts and locks—fitting up furniture for the showroom, including proper methods of fastening glass—proper methods of affixing cornice poles, window seats and cosy corners.

The necessary tools and timber will be provided by the Schools.

CABINET-MAKING (DRAWING AND LECTURE). II., III. AND IV.

67. Nature and properties of the various kinds of wood used in cabinet-making, their suitability for decorative work, their diseases and how to minimise their effect before and after being converted into furniture—mechanical actions, such as are used in cylinder fall desks, writing tables, dumb waiters, etc.—different methods of expanding dining tables—cabinet brass work : hinges, joint stays, bolts and locks —best methods of fixing—inlaying and veneering with tortoiseshell, ivory, mother of pearl, and metals—preparation and methods of applying veneers to flat and sweep work—styles of furniture and the periods to which they belong—joints : plain copper, dowelling, tonguing and dove-tailing, secret lap and secret mitre dove-tailing—methods of setting out—construction of working drawings from student's own designs.

TEXT BOOK.—Bitmead : Cabinet-making.

CABINET-MAKING (PRACTICAL). II., III. AND IV.

68. In this Class difficult pieces of Cabinet work will be undertaken, and the complete setting out and working of pieces of furniture.

More advanced work on the First Year Course, and, in addition :—

Inlaying and veneering with tortoiseshell, ivory, mother-of-pearl, and metals—preparation of ground work and veneering of difficult pieces of cabinet work—making of joints, such as secret lap and secret mitre dovetail, knuckle rule and finger—construction of difficult Roman and Grecian mouldings by hand.

Students taking the City and Guilds Final Examination in Cabinet-making will find this Class suitable for the construction of the specimen of practical work to be submitted to the Examiners.

The necessary tools and a supply of ordinary timber will be provided by the Schools.

TEXT BOOK.—Bitmead : Cabinet-making.

UPHOLSTERY. I., II., III., AND IV.

GENERAL SYLLABUS—LECTURE AND PRACTICAL WORK.

76. Proper preparation of framework for upholstering. *Materials used* : Leather, leather-cloth, velvet, saddle-bags, tapestry, rexine, lace, etc.—use of springs—upholstering to suit various styles of furniture—treatment of couches, sofas, settees and chairs of various kinds—re-upholstering old work—re-conditioning of old materials—enamelling old frames for necessary repairs—tools and appliances used in upholstery. Measuring up for outdoor upholstery, arranging and fixing such work.

WOOD CARVING. I., II. AND III.

The course of instruction in Wood-carving includes a lecture and drawing class on one evening, practical work on one *or* two evenings, and a suitable Art class in drawing and design on another evening. The practical work will be of a progressive nature and selected in each case to suit the skill of the individual student.

82. The use and names of tools used in wood-carving—sharpening of tools—stones employed—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—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.

The work of the Italian Renaissance explained and examples given—the French Renaissance explained—natural foliage and geometrical treatment—the Gothic periods—Norman periods—Early English period—decorated period—perpendicular styles—examples of architectural treatment—carvings as applied to furniture—individuality of style explained and examples given.

FRENCH POLISHING. I. AND II.

90. The art of French polishing—manufacture and use of various stains and polishes—colouring and lacquering—varnishing and glazing—gums and their use—colours and their use—aniline dyes and chemicals used in stains—methods of polishing different woods, wooden carvings and statues—imitation inlay transfer papers, various methods of polishing—German, Scotch, English, American, Swedish and French.

Spray polishing—Use of gun for Cellulose polishing, preparation of surfaces. Preparation and use of materials—matching colours, toning down. Staining with cellulose lacquers. Treatment of modern furniture.

COACH AND MOTOR BODY BUILDING. I., II. AND III.

GENERAL SYLLABUS—LECTURE, DRAWING AND PRACTICAL WORK.

95. Construction of scales and their use—timber used in Coach Building and Motor Body work—measuring and valuing—natural and artificial seasoning, and the use of bent timber—iron and steel: process of forging and welding—how to tell the quality of steel and iron—precautions when forging or tempering various kinds of iron and steel—aluminium and other metals used for panels, wings, etc.—designing and drawing side view, plan and back view of carts, waggonettes, landaus, victorias, broughams and other carriages, open or closed, and motor bodies—designing drawing and making joints in coach-building—sizes of poles, bars and shafts for various horses or

ponies—position of tug stops and staples, etc.—varieties of undercarriages—wheels with wooden spokes, including artillery patterns—sections of hubs, spokes and tyres, channels, pneumatic tyres, etc.—sizes and shapes of axles and springs and motor axles—spring making and methods of testing springs and axles; setting them true and fixing—shock absorbers—ironwork on bodies and carriages—lever brakes—foot brakes—wind screen—ironwork for luggage, tyre carriers, grids, etc.—tools used by body builders: sketches and descriptions—common workshop appliances and machinery—designing and drawing of all kinds of motor bodies—making working drawings for use in the shop, such as drawings of ironwork, sections of framing and naves—calculating the sizes of wheels, springs, axles and the quantity of timber required—writing out workshop orders—specifying the work to be done to a carriage or motor car when worn or damaged—estimating the cost of repairs—the general principles of costing—remedying of defects such as noise or vibration—methods of overcoming difficulties of construction, as in making folding hoods and seats, movable canopies and brougham tops, landaulette pillars and door tops.

COACH PAINTING. I. AND II.

GENERAL SYLLABUS—LECTURE, DRAWING AND PRACTICAL COURSE.

115. Painting: materials used and process of painting and varnishing—preparation of paint from crude or dry colour—properties of oils, varnishes and other materials used—lettering, crests, etc.—tools used by painters, care and use—workshop appliances.

Paint Spraying: Modern Appliances. Use of Gun. Preparation of materials.

COACH TRIMMING. I. AND II.

The Course will occupy two Sessions.

GENERAL SYLLABUS—LECTURE AND PRACTICAL WORK.

122. Trimming materials: leather, cloth, lace, etc.—methods of sewing, stuffing, etc.—marking out materials, especially with a view to appearance and economy—flat and curved work—tools and appliances employed.

WOODCUTTING MACHINERY I, II AND III.

GENERAL SYLLABUS, LECTURE, DRAWING AND PRACTICAL WORK.

Construction of scales and their use. Measurement and construction of angles. Simple working drawings and plans. Setting out pieces of joinery and cabinet work on rods preparatory to machining and preparing cutting lists. Drawing joints used in construction of various machine finished pieces of framing—Joinery and furniture.

Timber.—Technical terms, methods of measuring, growth, conversion, seasoning, suitability for various jobs. Cutter projection scales, enlarging and diminishing mouldings.

The names and forms of common mouldings and other stock sections, including the various parts of frames and sashes, doors, etc.

Speed calculations re pulleys, saws and cutter blocks.

Practice in the following machines:—Circular saws, band saws, fret saw, surfacer and thicknesser, tenoning and scribing, chain and hollow chisel mortiser and spindle moulder. Circular saw setting and sharpening. Band saw brazing, sharpening and setting. Belt lacing and stitching. Grinding and sharpening cutters for use on tenoning, planing and vertical spindle moulder. Types of cutter blocks used on various machines and their suitability for various work.

Instruction in the use of safeguards as laid down by the Minister of Industry and Commerce, covering all classes of woodcutting machinery.

Preparation of templates for curved work and use of jigs for holding light work during machining operations.

Practice will be afforded in joinery and furniture manufacture.

BRICKLAYING (PRACTICAL). I.

135. Methods of bonding in walls of various thicknesses—preparation of foundation and footings—position of damp-proof courses—position of vents—laying and jointing of drain pipes—pointing a piece of brickwork in various ways—cutting of simple arches—cutting the skewback—simple weathering to buttresses corbelling—junctions of walls—plain tiling.

BRICKLAYING (DRAWING AND THEORY). I.

136. *Bricks*: Essentials of ordinary building bricks—well-known varieties—practical tests—approximate weight and dimensions. *Mortars*: cements, limes, sand and other ingredients—proportions—preparation and mixing. *Concrete*: ingredients—proportions—preparation and mixing. *Foundations*: concrete and brick footings—cause and prevention of dampness in buildings—land drains. *Terms and Processes*: meaning of various terms used—function of mortar—effect of thickness of joints—strength and durability—approximate costs. *Bonding*: necessity for bond—various systems of bonding—value of these systems in regard to stability, economy and appearance. *Pointing*: various methods—advantages and disadvantages of the different methods—composition of pointing mortars. *Brick Arches*: object of arches—different types—bond in arches—setting out of the various types. *Elementary Principles of Statics as affecting Brickwork*: calculation of weight—determination of pressure. *Measurement of Work and Materials*: amount of excavation required—volume of concrete and brickwork in foundations and footings expressed in rods, super or cubic yards—quantities of materials required for a particular piece of work—geometry as applied to bricklayers' work.

BRICKLAYING (PRACTICAL). II.

137. *Bonding*: various systems of bonding in obtuse and acute angles—bonding in rebated jambs—special and broken bonding—hollow walls—curved walls—cutting and bonding in elliptic and other arches—cutting brickwork over arches—cutting to gables. *Bonding in Chimney-Breasts, Fireplaces and Flues*: gathering of flues—setting of kitchen range and register grate. *Preparation of Gauged Arches with piece of gauged face-work*: use of moulded bricks in panels, string-courses and cornices—construction of manholes and inspection shafts—laying and jointing of drain pipes and connecting up to gullies and soil pipes—preparation of reinforced concrete lintel—constructing a small egg-shaped sewer. *Tiling*: plain and ornamental—bonding buttresses and building inverted arches.

Practice will be afforded in setting out pieces of brickwork from architectural drawings.

BRICKLAYING (DRAWING AND THEORY). II.

138. *Bricks*: essentials of facing bricks—method of testing—hand-made and machine-made bricks—well-known varieties, local and other. *Mortars and Concrete*: more intimate knowledge of these materials—effect of frost and rapid drying—waterproofing—object of steel reinforcement—correct fixing of reinforcing bars. *Bonding*: application of the systems to obtuse and acute angles, reveals and jambs—special bonding—broken bond—bonding in hollow walls and curved walls—copings—cutting to gables over arches—brick paving. *Domestic Chimneys and Fireplaces*: dimensions, form and course of fireplaces—prevention of smoky chimneys—bonding of stacks—grouping of flues and construction of fireplaces. *Walls of Brick and Stone*: adding new work to old—chase-bonding—block-bonding—toothing—metal ties. *Roof and Weather Tiling*: plain tiles—pan tiles—characteristics of good tiles—floor tiles. *Arches and Gauged Facings*: setting out of elliptical and other arches—gauged brickwork in walls and piers—moulded brickwork. *Drains*: essentials of good drain pipes—course, fall and construction of drains—construction of manholes and inspection shafts—fixing of gullies. *Stability of Walls and Piers*: principle of moments—graphical representation of forces in one plane—centres of gravity of walls, buttresses and retaining walls—safe loads on brickwork and concrete—bearing power of various soils and safe loads—usual modes of measuring any of the work comprised in the foregoing—geometry as applied to bricklayers' work.

BRICKWORK (PRACTICE). III.

SYLLABUS.

139. *Practical Work*: bonding irregular piers, etc.—arches, moulded and elliptical—niche hoods finished and for plastering—geometrical tiling—corbelling—splay corners to square, etc.—enamel work in walls and arches.

BRICKWORK (THEORY). III.

140. *Drawing*: Bricks, mortar, cements—more intimate knowledge of these materials—bonds of various kinds—arches and niche hoods—shoring and underpinning—flying, raking and dead shores—

fire bricks and firework in Lancashire boilers, retorts, etc.—walls of stone, cutstone cornices, joints, means of fastening—lintels, etc.—tracery windows, etc.

COURSE IN STONECUTTING. I AND II.

GENERAL SYLLABUS—LECTURE, DRAWING AND PRACTICAL WORK.

FIRST AND SECOND YEARS.

143. *Geometry*: Simple examples of the application of Plane and Solid Geometry to Masonry. Explanation of simple terms used in masonry. Use of scales. *Mouldings*: Names and descriptions—enlarging and diminishing. *Arches*: Historical development—method of setting out. *Moulds*: Preparation of moulds of various kinds—mensuration applied to masonry. *Walls*: Various kinds—rubble, Ashlar and composite—securing same against damp. *Windows*: Mullioned and corbelled. *Stairs*: Straight and geometrical—points in stairs and landings. *Stone*: Simple description of limestone and sandstone—quarrying. *Tracery Windows*: Setting out—history and development. *Mouldings*: Simple and complex—polygonal bases, columns and caps. *Materials*: Care in selection, method of booking and ordering. *Appliances*: Description—method of using. *Circle-on-Circle Work*: Difficulty of construction—precautions in fixing. *Roofs*: Construction of Simple Stone roofs for porches. *Letter Cutting*: Raised and Incised.

Machinery: Use of machines for various processes.

COURSE IN LAND SURVEYING AND LEVELLING.

The Course is intended to give a sound theoretical and practical knowledge of Surveying, to give facility in the use of the various instruments, in plotting surveys, and in making finished plans. It will be found of service to students preparing for the examinations of the Institution of Civil Engineers, etc. It also covers much of the work required for the various foreign examinations for Surveyors.

The Course will comprise *eighteen* lectures and *ten* practical demonstrations—some devoted to field work, and some to office work. The dates and places for the field work will be announced in class as the Course proceeds.

All apparatus and instruments for field work are provided by the Schools, but students must provide their own plotting scales, survey book, level book, drawing instruments and materials.

SYLLABUS.

150. *Surveying with the Chain* : object in making a survey, apparatus used; testing chain for length, measures of length and area. *Simple Surveying Operations* : ranging a line, fixing position of a point relative to a line, setting out a perpendicular to a line, connecting points invisible from one another; optical square. *Chaining* : Duties of leader and follower, chaining on slopes, stepping, clinometer. *Simple Surveys* : stations, main lines, triangles, well and ill-conditioned offsets, offset rod. Methods of dealing with fields, town plots and small estates of regular or irregular outline. Obstacles, such as buildings, lakes, rivers. *Booking the Survey* : forms of field book, methods of entering the notes, conventional signs. *Magnetic Compass and Magnetic Bearings* : variations of the compass, prismatic compass. *Traversing with Chain* : setting out curves. *Levelling* : instruments employed; level, construction of telescope, level staff, Abney level, clinometer, aneroid barometer. *Simple and Compound Levelling* : bench marks, datum line, curvature of earth, refraction. *Methods of Booking Levels* : rise and fall methods, collimation method, reduction of levels and method of checking, check levels. *Sections* : cross sections and longitudinal sections, working sections. *Plotting Sections* : horizontal and vertical scales, information required on the plotted section. *Principles of Contouring, Permanent Adjustment of Level* : office work, scales, meaning of representative fraction, scales used on ordnance plans, plotting. *Materials* required, brushes, colours, instruments. Plotting the field notes, mode of procedure, style of writing and printing, north points, colouring, ornament, preparation of finished plans. *Copying Plans* : Tracing, heliography, enlarging and reducing, pantograph. *Mensuration of Areas* : Methods of triangles, method of ordinates, Simpson's rule. Planimeter, computing scale.

An examination in the theory and practice of surveying will be held at the close of the Course, and certificates will be awarded to successful students.

COURSE IN BUILDERS' QUANTITIES.

The Class is intended to supply a course of elementary instruction in Quantity Surveying as practised in Dublin and district, to Architects', Surveyors' and Builders' pupils and assistants, and others engaged in the building trade. Intending students should have a practical knowledge of Building Construction and Drawing and be versed in the elements of mensuration. Instruction will be given in the usual methods of taking off, abstracting and putting into estimating form the materials and labour required in the various trades.

The instruction will be given mainly by lectures illustrated by blackboard sketches; in addition, questions for homework will be set weekly.

Students will be required to provide themselves with a set of paper scales.

SYLLABUS.

151. *Quantities and Specifications* : general explanation of both, with their essential differences. *Taking off* : explanation and description of various methods of taking-off, with simple examples; squaring dimensions.

Abstracting : explanation; general hints and simple examples reducing the alternative estimates. *Billing and Pricing* : explanation; general hints and simple examples.

The mode of measurement and description of the following :—

Excavator and Drainer : excavations over surface, and for basements and trenches; disposal of material; strutting and planking——drains; pipes, bends, junctions, traps, inspection chambers, connections to sewers. *Bricklayer* : concrete in foundations; floors and walls; common brickwork, including party walls; chimney breasts; boundary walls; openings; battered and circular work; work in cement; damp courses; pointing; cuttings; beam filling; trimmer and relieving arches; facings; moulded courses, etc. *Mason* : rubble walling; wallstone and ashlar facing; dressing, including plinths, sills; strings, cornices, copings, heads, templates; flagging steps, square and spandril; hearths; landings. *Carpenter and Joiner* : centring; floors; roofs; partitions; windows; doors, staircases, etc. *Ironfounder and Smith* : cast-iron work in pillars; pipes; beams and gutters; rolled and built steel girders; and iron roofing. *Slater and*

Tiler: straight, circular and vertical; eaves course; cuttings; ridges; hips and valleys. *Plumber and Zinc Work*: flats; gutters; cisterns; flashings; bends; stock gutters and pipes in cast-iron; bath and lavatory fittings, etc. *Glazier*: sheet, ground, rolled and polished plate and lead lights. *Plasterer*: lime-washing walls; rendering on walls; lath and plaster ceilings and partitions; cornices; enrichments; soffits; cement dadoes and skirtings. *Painter*: Painting on walls, wood and iron, external or internal; graining, staining, varnishing and lettering.

TEXT BOOK.—W. E. Davis: Quantities and Quantity Taking.

COURSE IN GEOMETRICAL HANDRAILING.

(Open only to Journeymen Carpenters or other qualified persons).

The accommodation available for this course being limited, preference will be given to applicants who are past students of the Schools. Those who wish to secure a place should make early application.

SYLLABUS.

152. Setting out wreath for quarter circle plan—method of obtaining the face mould and bevel—practical work—cutting wreath from the plank, bevelling, squaring and moulding—setting out wreath for semi-circular plan-arrangement of risers—how to obtain the face moulds and bevels for equal and unequal pitches—cutting wreath from the plank, bevelling and squaring, joining to straight rail, etc.—setting out terminal scroll and wreath—methods of obtaining bevels, face moulds and falling lines, jointing and moulding complete—setting out wreath over quarterspace of winders; obtaining the face mould and bevels; working and moulding wreath —setting out wreath for ship's stair, with quadrant well and level landing, the wreath being in two pieces.

Students will require to provide themselves with the ordinary drawing instruments and drawing paper. The Schools will supply the necessary woodworking tools and timber.

COURSE IN MANUAL INSTRUCTION (WOODWORK).

I. AND II.

The main objects of the Class are to afford a training in the proper use of woodworking tools, to give a knowledge of the proper

proportion and suitability of joints for different purposes, to enable students to make articles of domestic, personal or other use, and to provide a medium for the learning of mechanical drawing and sketching.

153. *Drawing*: Simple projection, as required for the working drawing of each model. *Woodwork*: Exercises in planing, sawing and chiselling—making of woodworking joints—models of a useful nature, involving the use of these joints. *Theory*: Construction of the various tools, grinding and sharpening of edged tools. *Timber*: Woods in common use, growth, sources of supply, nature and properties; seasoning of timber.

In the Second Year of the Course the work will be chiefly the making of models of a utilitarian nature, and students will be allowed some freedom in their choice of models.

The necessary tools and timber are provided by the School.

MECHANICAL DRAWING, PATTERN CONSTRUCTION AND GEOMETRICAL DESIGN.

154. The course is arranged so that students may become acquainted with the use of instruments, T-square, set-squares, compass, scales, etc., and the principles of construction of ordinary geometrical figures —special reference will continually be made to the application of geometry to the different branches of industrial art, such as designing, etc. The exercises worked in class will include the drawing of geometrical patterns—spacing of wall and other surfaces for decorative purposes—bands and borders—units of pattern—diapers—the construction of arch-forms—tracery and mouldings. In addition, exercises will be given in the projection of simple solids.

CLASS IN PLAN DRAWING AND READING.

This Class is suitable for clerks in architects' and builders' offices, auctioneers, land agents, those engaged in insurance work, heating, engineers and others.

155 Drawing instruments, general setting out and arrangement—construction and use of scales—lettering simple form—use of protractor—segmental and elliptical curves—simple scale drawing—

GENERAL CURRICULUM OF THE SCHOOLS

UNDER THE CONTROL OF

THE CITY OF DUBLIN VOCATIONAL EDUCATION COMMITTEE.

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BOLTON STREET TECHNICAL SCHOOL

Mechanical Engineering.
Motor Car Engineering.
Gas Engineering.
Metal Plate Work.
Brass Finishing.
Building Science.
Building and Allied Trades.
Printing and Book Production.
Watchmaking.
Art and Art Crafts.

Day Apprentice and specialised Daytime Technical Courses.
Day Junior Technical School.

KEVIN STREET TECHNICAL INSTITUTE

Pure and Applied Mathematics.
Pure and Applied Physics.
Pure and Applied Chemistry.
Bacteriology.
Pharmacy.
Electrical Engineering and Allied Trades.
Radio-Telegraphy.
Art and Art Crafts.
Domestic Science and Housecraft.
Bakery Science and Practice.
Bootmaking.
Hairdressing.
Tailoring.

PARNELL SQUARE TECHNICAL INSTITUTE

General Commercial Subjects.
Accountancy and Allied Subjects.
Local Government.
Domestic Science and Housecraft.
Languages.
Retail Distribution.
Transport.
Day Trade Classes:—
Dressmaking.
Shirtmaking (Power).
Clothing Manufacture (Power)
Chefs' Training Course.

Day School of Commerce.
Pre-Employment Day Courses for Girls.

GENERAL CURRICULUM OF THE SCHOOLS

UNDER THE CONTROL OF

THE CITY OF DUBLIN VOCATIONAL EDUCATION COMMITTEE.

PEMBROKE TECHNICAL INSTITUTE (Ringsend and Ballsbridge)

General Commercial Subjects.
Retail Distribution.
Languages.
Domestic Science and Housecraft.
Art and Art Crafts.
Mechanical Engineering.
Motor Car Engineering.
Oxy-Acetylene Welding.
Building Trades.

Day School of Commerce.
Day Junior Technical School.

RATHMINES TECHNICAL INSTITUTE

General Commercial Subjects.
Accountancy, Auditing and Allied Subjects.
Insurance.
Advertising and Publicity.
Banking, Finance and Foreign Exchange.
Company Secretaries.
Government Accountancy & Finance.
Languages.

Domestic Science and Housecraft.
Day School of Commerce.
Pre-Employment Day Courses for Girls.

MARINO TECHNICAL INSTITUTE

General Commercial Subjects.
Languages.
Domestic Science and Housecraft.
Metalwork.
Science.
Woodwork.

Day Junior Technical School.
Day School of Commerce.
Pre-Employment Day Courses for Girls.

CHATHAM ROW SCHOOL OF MUSIC (Day and Evening Classes)

Pianoforte.
Violoncello.
Uilleann and Irish War Pipes.
Elocution.
Violin.
Singing and Choir.
Organ.
Wind Instruments (Wood & Brass).
Fifes.
Viola.
Orchestra.
Drums and Flute.
Traditional Music.
Irish Harp.