

1940

Architecture, Building and Furniture Trades : Prospectus, 1940-41

City of Dublin Vocational Education committee

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City of Dublin
Vocational Education Committee

SCOILEANNA CEÁRD-OIDEACÁIS
City of Dublin Technical Schools

seisiún
1940-41



Session
1940-41

Architecture, Building
and Furniture Trades

PROSPECTUS OF COURSES

BOLTON STREET

CALENDAR—SESSION 1940-41

1940—SEPT. 2, MONDAY	Whole-time Day Schools open for enrolment, and Day Apprentice School resumes work.
SEPT. 9, MONDAY	Part-time Day Classes open for enrolment, and Whole-time Day Schools commence work.
SEPT. 16, MONDAY	Evening classes open for enrolment and Part-time Day classes commence work.
SEPT. 23, MONDAY	Evening classes commence work.
NOV. 1, FRIDAY	<i>All Saints' Day.</i> Whole-time Day Schools—excepting Day Apprentice School and Special classes—closed.
DEC. 8, SUNDAY	<i>Feast of Immaculate Conception.</i>
DEC. 14, SATURDAY	Teaching work in Whole-time Day Schools ceases—excepting Day Apprentice School and Special classes.
DEC. 16, MONDAY	Term Examinations in Whole-time Day Schools commence.
DEC. 21, SATURDAY	Last meeting of classes before Christmas Vacation.
1941—JAN. 7, TUESDAY	All classes resume work after Christmas Vacation.
MAR. 17, MONDAY	<i>St. Patrick's Day.</i>
APR. 8, TUESDAY,	Last meeting of Day and Evening classes before Easter Vacation.
APR. 16, WEDNESDAY	All classes resume work after Easter Vacation.
MAY 2, FRIDAY	Evening classes close—excepting where otherwise arranged.
MAY 22, THURSDAY	<i>Ascension Day.</i> Whole-time Day Schools—excepting Day Apprentice School and Special classes—closed.
JUNE 2, MONDAY	<i>Whit-Monday.</i> Schools closed.
JUNE 12, THURSDAY	<i>Feast of Corpus Christi.</i> Whole-time Day Schools—excepting Day Apprentice School and Special classes closed.
JUNE 21, SATURDAY	Teaching work ceases in Whole-time Day Schools excepting Day Apprentice School and Special classes.
JUNE 23, MONDAY	Sessional Examinations commence in Whole-time Day Schools excepting Day Apprentice School and Special classes.
JUNE 28, SATURDAY	Whole-time Day Schools and Part-time Domestic Economy classes close—excepting Day Apprentice School and Special classes.
JUNE 29, SUNDAY	<i>Feast of Saints Peter and Paul.</i>
JULY 12, SATURDAY	Day Apprentice School and other classes close excepting where otherwise arranged.

Schools closed on all Bank Holidays not specified in above Calendar.

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CITY OF DUBLIN

VOCATIONAL EDUCATION COMMITTEE

COMMITTEE

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" J. J. BYRNE, B.A., B.L., 60 Talbot Street.
" FINTAN BURKE, 4 Wilfield Road, Ballsbridge.
Miss HELENA MOLONY, 48 Fleet Street.
MICHEAL O'FOGHLUDHA, 5 Cabra Road.
Mr. M. P. ROWAN, 52 Capel Street.
Dr. LORCAN G. SHERLOCK, 18 Kildare Street.
Mr. W. J. WHELAN, 35 Lower Gardiner Street.
Mr. M. COLGAN, 44 Lt. Gardiner Street

Offices:

TECHNICAL INSTITUTE,

BOLTON STREET,

DUBLIN.

L. E. O'CARROLL, B.A., B.L.,

Chief Executive Officer.

LOCAL SUB-COMMITTEE, BOLTON STREET

- Alderman C. BREATHNACH, LL.D., T.D., 384 Clontarf Road (ex-officio).
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Mr. W. J. WHELAN, 35 Lower Gardiner Street.
Senator SEAN CAMPBELL, 35 Lower Gardiner Street.
Mr. GERALD DOYLE, 32 East Essex Street.
Mr. THOS. DARCY, 91 Ceannt Fort, Mount Brown.
Mr. J. G. WILSON, 13 Sackville Place.
Mr. T. A. CRAMPTON, Hammersmith Works, Ballsbridge.

ADVISORY SUB-COMMITTEE.

BUILDING TRADES.

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Mr. GEORGE P. WALSH.
Mr. THOMAS CROWLEY.
Mr. EDWARD KEARON.
Mr. MICHAEL CREEDON.
Mr. E. THOMPSON.

- Mr. ROBERT F. MORGAN.
Mr. THOMAS DUNNE.
Mr. OWEN HYNES.
Mr. LEO CRAWFORD.
Mr. PATRICK GAVAN.
Mr. MARK DALY.

GENERAL NOTICES

Admission and Attendance.—The Evening Session opens on Monday, 16th September, 1940, when teachers will be present to advise applicants regarding suitable Courses for Study and to certify students' Entrance Forms.

Applicants for admission to Courses or Classes must be at least fourteen years of age. Pupils in attendance at Public Primary or Secondary Day Schools are not eligible for admission to evening classes.

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

Each student must present a *Class Ticket* before admission to a class.

The opening of a class will depend on the enrolment of a sufficient number of students.

A class may be discontinued at any time should the attendance fall below the number necessary to justify its continuance, and the number of evenings allotted weekly to a class may be reduced if there be a falling away in the attendance.

The name of a student who has been absent for three successive class meetings may be removed from the Register unless a note of explanation has been sent.

Students are required to come provided with a note-book and pencil or with such drawing instruments or other requisites as may be necessary for the work of the class.

Discipline.—Strict order must be observed at all times in the precincts of the School. Smoking is not permitted within the building.

Students' Property.—The Vocational Education Committee do not accept responsibility for loss or damage to any property—bicycles, coats, hats, books, etc.—brought to the School by students.

Damage to Person.—The Committee do not accept responsibility for injury to a student resulting from the student's personal neglect or disregard of the Regulations laid down for the conduct of the operations in the workshops or laboratories.

The Trade Classes are generally confined to those engaged in the several trades. Others will not be admitted before November 8th, and then only if there be room, and on payment of a quadruple fee.

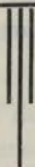
A Laboratory or Workshop Class can only be taken in conjunction with an approved Lecture or Drawing Class. No student will be allowed to continue in a Laboratory or Workshop Class if his attendance at the Lecture or Drawing Class is unsatisfactory.

Students must make good any damage done by them.

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.

<i>Fees.</i>			s.	d.
Introductory and Preparatory Courses	...	2	6	for Session
General Courses or Single Subjects	...	7	6	„
Additional Subjects, each	2	6	„
Irish	2	6	„
Land Surveying and Levelling	10	0	for Course
Building Science	£3	0	0 „
Course for Architects' Apprentices	...	10	0	for Session
Day Junior Technical School Course	...	£1	0	0 „

SCHOOL OF



Architecture, Building
and Furniture Trades

TECHNICAL INSTITUTE

BOLTON STREET

DUBLIN

SCHOOL OF ARCHITECTURE
 BUILDING AND FURNITURE
 TRADES . Technical Institute
 Bolton Street

TEACHING STAFF

DONAL F. O'DWYER, B.ARCH., M.R.I.A.I., Head of Department.

- | | |
|--|----------------------------|
| ALOYSIUS HANWAY. | PATRICK HICKS. |
| WILLIAM D. HORGAN, B.A. | THOMAS ROCHE. |
| HENRY C. CLIFTON, B.A. | JAMES SAUNDERS, FULL TECH. |
| R. C. GRIMES, A.B.I.C.C. | C. AND G., ART MEDALLIST |
| JOSEPH CLARKE. | B. OF E. |
| A. M. McLOUGHLIN, B.A.,
A.R.C.SC.I. | ROBERT W. BROWN. |
| W. L. WHELAN, A.M. | RICHARD McNAMARA. |
| JAMES J. BURKE. | GEORGE O'KEEFFE. |
| JOHN J. DOYLE, B.COMM.,
H.DIP.ED. | EDWARD BYRNE. |
| MARTIN J. BURKE, M.S.A., F.S.I.,
L.R.I.B.A. | CHARLES O'BYRNE. |
| A. E. WILLIAMS, M.R.I.A.I.,
A.M.I.S.E. | W. J. N. O'BRIEN, DIP.ING. |
| JOHN O'CALLAGHAN. | J. J. HUGHES. |
| JAMES F. CLEARY. | H. W. DEMPSEY. |
| CHARLES KENNY. | M. C. MURRAY. |
| THOMAS BRIDGEMAN. | JAMES LEVINS. |
| JOHN G. BOLTON. | H. O'FLYNN. |
| THOMAS McCLUSKEY. | DANIEL L. ROONEY. |
| W. PURCELL. | JOHN SLOAN. |
| | P. O RIAIN. |
| | J. J. McKEOWN, F.B.I.C.C. |
| | H. DARKER, M.I.Q.S.A. |

DESCRIPTION OF COURSES.

INTRODUCTORY COURSE (100 B).

A course for those who are not sufficiently qualified to enter for a full technological course.

TECHNOLOGICAL COURSES.

THE COURSE FOR ARCHITECTS' APPRENTICES (No. 101-105) is a part-time day and night course for pupils in Architects' offices. It is assumed that students taking the course will have passed the Preliminary Examination of the Royal Institute of the Architects of Ireland or its equivalent and a mathematical knowledge of that standard will be necessary if proper benefit is to be derived from the course.

THE BUILDING SCIENCE COURSE (No. 111) is a two-year full-time day course commencing on alternate years and is designed for those who intend to enter the offices of Quantity Surveyors, Builders, etc., or who intend to enter the Public Services as Architectural Draughtsmen. As the number attending the course will be limited preference will be given to those whose education and suitability appear to be most satisfactory.

THE GENERAL BUILDING COURSE (No. 113-117) is a night course for Quantity Surveyors, Builders, Clerks of Works and others. The first and second years of the course together cover the ground of the Department of Education's Elementary Stage Examinations in Building, the third and fourth years cover the ground of the Intermediate Stage Examinations and the fifth year the ground of the Advanced Stage Examinations. Every facility is given to students who wish to enter for the Department of Education or for the City and Guilds Technological Examinations.

TRADE COURSES.

The trade courses are, except in special cases confined to those engaged in the several trades. Every facility is given to students who wish to enter for the Department of Education or for the City and Guilds Trade Examinations.

NIGHT COURSES leading to the Department of Education Trade Certificate Examinations are provided in the following trades :—

- Bricklaying (four year course, Nos. 154-157);
- Carpentry and Joinery (four year course, Nos. 160-163);
- Plumbing (four year course, Nos. 164-167);
- Plastering (four year course, Nos. 169-172);
- Painting and Decorating (four year course, Nos. 173-176), and
- Cabinet-making (four year course, Nos. 177-180).

Night courses are also provided in the following trades :—

- Stonecutting (two year course, Nos. 158-159);
- Upholstery (four year course, Nos. 181-184);
- Woodcarving (three year course, Nos. 185-187);
- French polishing and spray polishing (two year course, Nos. 188-189);
- Wood-cutting machinery (three year course, Nos. 191-193);
- Coach and Motor body Building (three year course, Nos. 194-196);
- Coach painting and Paintspraying (two year course, Nos. 197-198), and
- Coach trimming (two year course, Nos. 200-201).

A class in Special Plumbing Work (No. 168) is provided for journeymen plumbers; a special class in Paintspraying (No. 199) is provided for journeymen coach painters, and a special class in Spray polishing (No. 190) for French polishers.

PART-TIME DAY COURSES. By agreement with the Dublin Master Builders' Association, the Master Painters' Association, the Trade Unions concerned and the Apprenticeship Committees, apprentices to certain trades are allowed time off to attend these courses of afternoon lectures and practical work. Courses are provided in the following trades :—

- Carpentry and Joinery (Nos. 122-123);
- Painting and Decorating (Nos. 126-127);

- Cabinet making (No. 130);
- French polishing (No. 134), and
- Wood cutting machinery (No. 136).

Similar part-time day courses will be inaugurated in other trades in which the requisite conditions can be procured.

DAY APPRENTICE SCHOOL. These scholarship courses are conducted under the terms of the Day Apprentice School Scheme (see General Guide). Scholarships comprise free training for two years in the Apprentice School with payment of six shillings weekly for the first year and eight shillings weekly for the second year. The scheme is at present operative in the following building trades:—

- Bricklaying (Nos. 144-145);
- Plumbing (Nos. 148-149), and
- Painting and Decorating (Nos. 150-151).

MISCELLANEOUS COURSES.

The following miscellaneous night courses are available:—

A **LAND SURVEYING AND LEVELLING COURSE** (No. 202) suitable for assistants and pupils in Architects', Engineers', Surveyors', Builders' and Insurance Offices. It commences in March of each year and comprises twelve weekly lectures and ten demonstrations in field work. The latter are held on Saturday afternoons.

A **PLAN DRAWING AND READING COURSE** (No. 208), suitable for clerks in Architects', Engineers', Surveyors' and Builders' offices and and for Auctioneers, Land Agents and those engaged in Insurance work.

MANUAL INSTRUCTION COURSES in Woodwork (Nos. 203-207) including classes in Mechanical Drawing and Design. The object of the courses is to provide a training in the use of woodworking tools combined with facility in drawing and sketching.

A **WOODCARVING COURSE** (Nos. 185-187) including classes in Mechanical Drawing and Design. This is the trade course but non-members of the trade are admitted.

SPECIAL COURSES IN IRISH (Nos. 209-210) which may be taken in conjunction with other courses.

DAY JUNIOR TECHNICAL SCHOOL COURSE. The Day Junior Technical School Course is designed to continue the general education of boys from the time when they normally leave a Primary School until they obtain employment at the age of about 16-17 years.

The curriculum includes Manual Instruction in Woodwork and Metalwork, Applied Science, Free and Practical Drawing and Practical Mathematics. The Course is thus particularly suitable as a pre-employment training for students who intend to follow trade or industrial occupations. It is a growing practice of employers to accept only boys who have received such training which, in certain instances, is made obligatory for entry into apprenticeship.

While suitable as a pre-apprenticeship training, the Course is not specialised towards a particular occupation. Care is taken to provide an education sufficiently extensive to ensure that the student will not be handicapped should he fail to become apprenticed to a trade, or should his tastes not incline in that direction.

The usual age for admission to the Course is from 14 to 15 years, and boys should have attained a standard of general education equivalent at least to the Sixth Standard of the Primary School programme. The Course, which is of two years duration, extends from the beginning of September to the end of June in each Session, and provides weekly instruction amounting to some twenty-six hours.

The Religious Instruction of the students is attended to by the local clergy. Special facilities are provided for Physical Training, organised games and social activities.

Fee for the Course, 20s. per Session.

Students who through obtaining employment, or for other satisfactory reason, are unable to continue in attendance at the whole-time Day School Courses will be admitted to approved Evening Courses without further fee.

COURSES AND TIME TABLES

INTRODUCTORY COURSE.

No of Course.	SUBJECT	Day	Hour	Room	TEACHER	No. of Syllabus
100	Workshop Arithmetic	...	Mon. 7.30-8.30		W. J. O'Brien	71
	English	...	Mon. 8.30-9.30		W. J. O'Brien	70
	Drawing	...	Tues. 7.30-9.30		B. E. Fee	72

COURSE FOR ARCHITECTS' APPRENTICES.

101	FIRST YEAR					
	Architectural Drawing—I.	Mon.	1.30-3.30	B 24	W. Whelan	1
	Design—I. ..	Tues.	2.0-5.0	B 17	D. F. O'Dwyer	2
	Practical Geometry I. and II.	Tues.	7.30-9.30	B 17	J. F. Cleary	11 & 12
	Building Construction—I.	Wed.	7.30-9.30	B 17	J. F. Cleary	3
	Design—I. ..	Thurs.	2.0-5.0	B 17	D. F. O'Dwyer	2
	Geometry, Mathematics and Mechanics ..	Thurs.	8.0-10.0		W. J. O'Brien	14
102	SECOND YEAR					
	Architectural Drawing II.	Mon.	1.30-3.30	B 24	W. Whelan	1
	Building Construction II.	Mon.	7.30-9.30	B 17	A. E. Williams	4
	Design II. ..	Tues.	2.0-5.0	B 17	D. F. O'Dwyer	2
	Applied Mechanics III (Strength of Materials and Theory of Structures)	Wed.	8.0-10.0		W. J. O'Brien	15
	Design II. ..	Thurs.	2.0-5.0	B 17	D. F. O'Dwyer	2
103	THIRD YEAR					
	Design III. ..	Mon.	2.0-5.0	B 17	D. F. O'Dwyer	2
	Design III. ..	Wed.	2.0-5.0	B 17	D. F. O'Dwyer	2
	Applied Mechanics IV. (Strength of Materials and Theory of Structures)	Wed.	8.0-10.0		W. J. O'Brien	16
	Architectural Drawing—III.	Thurs.	1.30-3.30	B 24	W. Whelan	1
	Building Construction—III.	Thurs.	7.30-9.30	B 17	A. E. Williams	5
	*Surveying and Levelling	Fri.	7.30-9.30	C 9	A. McLaughlin	20
104	FOURTH YEAR					
	Design—IV. ..	Mon.	2.0-5.0	B 17	D. F. O'Dwyer	2
	Design—IV. ..	Wed.	2.0-5.0	B 17	D. F. O'Dwyer	2
	Applied Mechanics—V. (Strength of Materials and Theory of Structures)	Wed.	8.0-10.0		W. J. O'Brien	16
	Building Construction—IV. ..	Thurs.	7.30-9.30	B 17	A. E. Williams	

* Course begins in March.

No. of Course	Subject	Day	Hour	Room	Teacher	No. of Syllabus
105	FIFTH YEAR					
	Design—V.	Mon.	2.0-5.0	B 17	D. F. O'Dwyer	2
	Design—V.	Wed.	2.0-5.0	B 17	D. F. O'Dwyer	2
	**Applied Mechanics—V. (Strength of Materials and Theory of Structures) . .	Wed.	8.0-10.0		W. J. O'Brien	16
	Building Construction—V. . .	Thurs.	7.30-9.30	B 17	A. E. Williams	7

BUILDING SCIENCE COURSE.

111	Building Construction —I., II. & III.	Mon.	9.30-12.30	B 17	A. Hanway	3, 4 & 5
	Architectural Drawing—I. & II.	Mon.	1.30-3.30	B 24	W. Whelan	1
	Business Methods & Economics	Tues.	10-11.30	B 18	J. Doyle	23
	Mathematics—III.	Tues.	1.30-3	C 7	H. Clifton	10
	Builders' Quantities	Tues.	7-9	C 21	H. Darker	22
	Practical Geometry —I., II. & III.	Wed.	10.30-12.30	B 17	A. Hanway	11 12 13
	Science	Wed.	2-4	A 6	W. Horgan	21
	Building Construction —I., II. & III.	Thurs.	10.30-12.30	B 17	A. Hanway	3, 4 & 5
	Architectural Drawing—I. & II.	Thurs.	1.30-3.30	B 24	W. Whelan	1
	Applied Mechanics—III.	Fri.	10.30-12.30	C 8	A. McLaughlin	15
	Building Construction —I., II. & III.	Fri.	1.30-4.30	B 17	A. Hanway	3, 4 & 5
	Surveying and Levelling * . .	Fri.	7.30-9.30	C 9	A. McLaughlin	20

* Course begins in March.

** Revision if desired.

GENERAL BUILDING COURSE.

No. of Course	SUBJECT	Day	Hour	Room	TEACHER	No. of Syllabus
113	FIRST YEAR.					
	Building Construction—I.	Wed.	7.30-9.30	B 17	J. F. Cleary	3
	Practical Mathematics—I, II.	Thurs.	7.30-9.30	C 7	H. C. Clifton	8, 9
	Practical Geometry—I, II.	Tues.	7.30-9.30	B 17	J. F. Cleary	11, 12
114	SECOND YEAR.					
	Building Construction—II. ..	Mon.	7.30-9.30	B 17	A. E. Williams	4
	Geometry, Mathematics and Mechanics	Thurs.	8-10	C 21	W. J. O'Brien	14
115	THIRD YEAR.					
	Building Construction—III. ..	Thurs.	7.30-9.30	B 17	A. E. Williams	5
	{ Applied Mechanics—III. or	Wed.	8-10	C 21	W. J. O'Brien	15
	{ Builders' Quantities—Inter.	Mon.	7.30-10.0	C 21	M. J. Burke	22
116	FOURTH YEAR					
	Building Construction—IV ..	Thurs.	7.30-9.30	B. 17	A. E. Williams	6
	{ Applied Mechanics —IV. or	Wed.	8-10	C. 21	W. J. O'Brien	16
	{ Builders' Quantities Inter.	Mon.	7.30-10.0	C. 21	M. J. Burke	22
117	FIFTH YEAR.					
	Building Construction—V. ..	Thurs.	7.30-9.30	B. 17	A. E. Williams	7
	{ Applied Mechanics—V. or	Wed.	8-10	C. 21	W. J. O'Brien	16
	{ Builders' Quantities—Adv. ..	Mon.	7.30-10.0	C. 22	M. J. Burke	22

PART TIME DAY COURSES IN CARPENTRY AND JOINERY, PAINTING AND DECORATING, CABINET MAKING, FRENCH POLISHING AND WOOD-CUTTING MACHINERY.

Time tables and Syllabuses will be issued later.

DAY APPRENTICE SCHOOLS OF BRICKLAYING, PLUMBING AND PAINTING AND DECORATING.

Time tables and Syllabuses will be issued later.

NIGHT COURSE IN BRICKLAYING AND STONELAYING.

154	FIRST YEAR.					
	Bricklaying (Practical) ..	Tues.	7.30-9.30	C 17	E. Byrne	28
	Bricklaying (Drawing and Theory)	Fri.	7.30-9.30	C 20	E. Byrne	29
155	SECOND YEAR.					
	Bricklaying (Practical) ..	Thur.	7.30-9.30	C 17	E. Byrne	30
	Bricklaying (Drawing and Theory)	Mon.	7.30-9.30	C 20	E. Byrne	31
156	THIRD YEAR.					
	Bricklaying (Practical) ..	Thurs.	7.30-9.30	C 17	E. Byrne	32
	Bricklaying (Drawing and Theory)	Mon.	7.30-9.30	C 20	E. Byrne	33
157	FOURTH YEAR.					
	Brickwork Drawing	Wed.	7.30-9.30	C 20	E. Byrne	

NIGHT COURSE IN STONECUTTING.

No. of Course	SUBJECT	Day	Hour	Room	TEACHER	No. of Syllabus
158	FIRST YEAR Stonecutting.					
	Lecture and Drawing ..	Tues.	7.30-9.30	D 16	J. Sloan	34
	Stonecutting, Practice ..	Thurs.	7.30-9.30	D 16	J. Sloan	34
159	SECOND YEAR Stonecutting.					
	Lecture and Drawing ..	Tues.	7.30-9.30	D 16	J. Sloan	34
	Stonecutting, Practice ..	Thurs.	7.30-9.30	D 16	J. Sloan	34

NIGHT COURSE IN CARPENTRY AND JOINERY.

160	FIRST YEAR. Carpentry and Joinery, Practice—I.	Tues.	7.30-9.30	C 10	J. O'Callaghan	35
	Practical Geometry and Calculations—I.	Fri.	7.30-9.30	B 26	J. F. Cleary	8, 11, 12
	160A Carpentry and Joinery, Practice—I.	Thurs.	7.30-9.30	C 10	J. O'Callaghan	35
	Practical Geometry and Calculations	Fri.	7.30-9.30	B 26	J. F. Cleary	8, 11, 12
161	SECOND YEAR. Carpentry and Joinery, Practice—II.	Fri.	7.30-9.30	C 10	J. O'Callaghan	36
	Carpentry and Joinery, Lecture and Drawing—II.	Wed.	7.30-9.30	B 26	T. Bridgeman	37
	162	THIRD YEAR. Carpentry and Joinery, Practice—III.	Mon.	7.30-9.30	C 10	J. O'Callaghan
Carpentry and Joinery, Lecture and Drawing—III.		Thurs.	7.30-9.30	B 26	J. F. Cleary	39
163		FOURTH YEAR. Carpentry and Joinery, Practice—IV.	Wed.	7.30-9.30	C 10	J. O'Callaghan
	Carpentry and Joinery, Lecture and Drawing—IV.	Thurs.	7.30-9.30	B 26	J. F. Cleary	41

NIGHT COURSE IN PLUMBING.

164	FIRST YEAR. Plumbers' Work, Lecture and Drawing—I.	Fri.	7.30-9.30	C 5	J. Bolton	42
	Plumbers' Work, Pract.—I. ..	Mon.	7.30-9.30	D 14	D. L. Rooney	43
	Chemistry and Physics for Plumbers—I.	Thurs.	7.30-9.30	A 6	J. J. Hughes	44

No. of Course	SUBJECT	Day	Hour	Room	TEACHER	No. of Syllabus
164A	Plumbers Work, Lecture and Drawing—I.	Fri.	7.30-9.30	C 5	J. Bolton	42
	Plumbers' Work, Pract.—I.	Tues.	7.30-9.30	D 14	D. L. Rooney	43
	Chemistry and Physics for Plumbers—I.	Thurs.	7.30-9.30	A 6	J. J. Hughes	44
SECOND YEAR.						
165	Plumbers' Work, Lecture and Drawing—II.	Wed.	7.30-9.30	C 5	J. Bolton	45
	Plumbers' Work, Pract.—II.	Thurs.	7.30-9.30	D 14	D. L. Rooney	43
THIRD YEAR						
166	Plumbers' Work, Lecture and Drawing—III.	Thurs.	7.30-9.30	C 5	J. Bolton	46
	Plumbers' Work, Pract.—III.	Wed.	7.30-9.30	D 14	D. L. Rooney	43
FOURTH YEAR.						
167	Plumbers' Work, Lecture and Drawing—IV.	Thurs.	7.30-9.30	C 5	J. Bolton	47
	Plumbers' Work, Pract.—IV.	Wed.	7.30-9.30	D 14	D. L. Rooney	43

SPECIAL COURSE FOR JOURNEYMEN PLUMBERS.

168	Copper Welding, Brazing, Lead-burning, etc.	Fri.	7.30-10.0	D 14	D. L. Rooney	48
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NIGHT COURSE IN PLASTERING.

FIRST YEAR.						
169	Plasterers' Drawing—I.	Tues.	7.30-9.30	B 24	J. J. McKeown	49
	Plasterers' Work, Practice and Theory—I.	Mon. Th.	7.30-9.30	C 16	J. Saunders	50
SECOND YEAR.						
170	Plasterers' Work, Practice and Theory—II.	Fri.	7.30-9.30	C 16	J. Saunders	50
	Do. Drawing—II.	Thur.	7.30-9.30	B 24	J. J. McKeown	49
	Modelling for Plasterers—II.	Wed.	7.30-9.30	C 16	J. Saunders	51
THIRD YEAR.						
171	Plasterers' Work, Practice and Theory—III.	Fri.	7.30-9.30	C 16	J. Saunders	50
	Do. Drawing—III.	Thur.	7.30-9.30	B 24	J. J. McKeown	49
	Modelling for Plasterers—III.	Wed.	7.30-9.30	C 16	J. Saunders	51
FOURTH YEAR.						
172	Plasterers' Work, Practice and Theory—IV.	Fri.	7.30-9.30	C 16	J. Saunders	50
	Do. Drawing—IV.	Thurs.	7.30-9.30	B 24	J. J. McKeown	49
	Modelling for Plasterers—IV.	Wed.	7.30-9.30	C 16	J. Saunders	51

NIGHT COURSE IN PAINTING AND DECORATING.

No. of Course	SUBJECT	Day	Hour	Room	TEACHER	No. of Syllabus
FIRST YEAR.						
173	Painters' Work, Pract.—I. ..	Tues.	7.30-9.30	C 11	C. O'Byrne	52
	Drawing and Theory—I. ..	Wed.	7.30-9.30	C 11	C. O'Byrne	53
SECOND YEAR.						
174	Painters' and Decorators' Work (Seniors and Journeymen)—II. Theory and Prac.	Thur.	7.30-9.30	C 11	C. O'Byrne	53, 54
THIRD YEAR.						
175	Painters' and Decorators' Work (Seniors and Journeymen)—III. Theory and Prac.	Fri.	7.30-9.30	C 11	C. O'Byrne	53, 55
FOURTH YEAR.						
176	Painters' and Decorators' Work (Seniors and Journeymen)—IV. Theory and Prac.	Fri.	7.30-9.30	C 11	C. O'Byrne	53, 55

NIGHT COURSE IN CABINET MAKING.

FIRST YEAR.						
177	Cabinet-making, Lecture and Drawing—I.	Thurs.	7.30-9.30	B 10	M. Murray.	56
	Cabinet-making, Pract.—I. ..	Fri.	7.30-9.30	B 11	M. Murray.	57
SECOND YEAR.						
178	Cabinet-making, Lecture and Drawing—II.	Mon.	7.30-9.30	B 10	M. Murray.	58
	Cabinet-making, Pract.—II. ..	Wed.	7.30-10.0	B 11	M. Murray.	59
THIRD YEAR.						
179	Cabinet-making, Lecture and Drawing—III.	Mon.	7.30-9.30	B 10	M. Murray.	58
	Cabinet-making, Pract.—III. ..	Tues.	7.30-10.0	B 11	M. Murray.	59
FOURTH YEAR.						
180	Cabinet-making, Lecture and Drawing IV.	Mon.	7.30-9.30	B 10	M. Murray.	58
	Cabinet-making, Practical ..	Tues.	7.30-10.0	B 11	M. Murray.	59

NIGHT COURSE IN UPHOLSTERY.

FIRST YEAR.						
181	Upholstery, Theory and Practice	Mon., Wed.	7.30-9.30	D 17	T. Roche	60
SECOND YEAR.						
182	Upholstery, Theory and Practice	Mon., Wed.	7.30-9.30	D 17	T. Roche	60
	Measuring and Outdoor Fixing	Thurs.	7.30-9.30	D 17	T. Roche	60
THIRD YEAR.						
183	Upholstery, Theory and Practice	Mon., Wed.	7.30-9.30	D 17	T. Roche	60
	Measuring and Outdoor Fixing	Thurs.	7.30-9.30	D 17	T. Roche	60
FOURTH YEAR.						
184	Upholstery, Theory and Practice	Mon., Wed.	7.30-9.30	D 17	T. Roche	60
	Measuring and Outdoor Fixing	Thurs.	7.30-9.30	D 17	T. Roche	60

NIGHT COURSE IN WOOD-CARVING.

No. of Course	SUBJECT	Day	Hour	Room	TEACHER	No. of Syllabus
185	FIRST YEAR.					
	Wood-carving, Lecture and Drawing—I.	Wed.	7.30-9.30	B 14	J. Levins.	61
	Wood-carving, Practical—I.	Thurs.	7.30-9.30	B 14	J. Levins.	61
	Mechanical Drawing and Design—I.	Fri.	7.30-9.30	B 10	R. Grimes	61
186	SECOND YEAR.					
	Wood-carving, Lecture and Drawing—II.	Wed.	7.30-9.30	B 14	J. Levins.	61
	Wood-carving, Practical—II.	Thurs.	7.30-9.30	B 14	J. Levins.	61
	Design—II	Fri.	7.30-9.30	B 10	R. Grimes	61
187	THIRD YEAR.					
	Wood-carving, Lecture and Drawing—III.	Wed.	7.30-9.30	B 14	J. Levins.	61
	Wood-carving, Pract.—III.	Thurs.	7.30-9.30	B 14	J. Levins.	61
	Design—III	Fri.	7.30-9.30	B 10	R. Grimes	61

NIGHT COURSE IN FRENCH POLISHING.
(Including Spray Polishing)

188	FIRST YEAR.					
	French Polishing, Theory and Practice	Mon.	7.30-9.30	C 12		62
189	SECOND YEAR.					
	French Polishing, Theory and Practice	Fri.	7.30-9.30	C 12		62

SPECIAL COURSE FOR FRENCH POLISHERS.

190	Spray Polishing	Wed.	7.30-9.30	C 12		62
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NIGHT COURSE IN WOODCUTTING MACHINERY.

191	FIRST YEAR.					
	Woodcutting Machinery—(Practical)—1.	Mon.	7.30-9.30	C 18	C. Kenny.	63
	Woodcutting Machinery—(Drawing)—1.	Tues.	7.30-9.30	B 10	C. Kenny.	63
192	SECOND YEAR.					
	Woodcutting Machinery—II. (Drawing)	Tues.	7.30-9.30	B 10	C. Kenny.	63
	Woodcutting Machinery—II. (Practical)	Thurs.	7.30-9.30	C 18	C. Kenny.	63
193	THIRD YEAR.					
	Woodcutting Machinery—III. (Drawing)	Wed.	7.30-9.30	B 10	C. Kenny.	63
	Woodcutting Machinery—III. (Practical)	Fri.	7.30-9.30	C 18	C. Kenny.	63

NIGHT COURSE IN COACH AND MOTOR BODY BUILDING.

No. of Course	SUBJECT	Day	Hour	Room	TEACHER	No. of Syllabus
FIRST YEAR.						
194	Coach and Motor Body Building					
	—I. (Lect. and Drawing) ..	Tues.	7.30-9.30	B 13	H. Dempsey	64
	Do. (Practical) ..	Fri.	7.30-9.30	B 13	H. Dempsey	64
SECOND YEAR.						
195	Coach and Motor Body Building					
	—II. (Lect. and Drawing) ..	Wed.	7.30-9.30	B 13	H. Dempsey	64
	Do. (Practical) ..	Thurs.	7.30-9.30	B 13	H. Dempsey	64
THIRD YEAR.						
196	Coach and Motor Body Building					
	—III. (Lect. and Drawing) ..	Wed.	7.30-9.30	B 13	H. Dempsey	64
	Do. (Practical) ..	Thurs.	7.30-9.30	B 13	H. Dempsey	64

NIGHT COURSE IN COACH PAINTING AND PAINTSPRAYING.

FIRST YEAR.						
197	Coach Painting—I. (Pract.) ..	Thurs.	7.30-9.30	B 23	R. McNamara	65
	Do. (Drawing and Lettering)	Tues.	7.30-9.30	B 23	R. McNamara	65
SECOND YEAR.						
198	Coach Painting—II. (Pract.) ..	Thurs.	7.30-9.30	B 23	R. McNamara	65
	Do. (Drawing and Lettering)	Tues.	7.30-9.30	B 23	R. McNamara	65

SPECIAL CLASS FOR JOURNEYMEN.

199	Paint Spraying	Wed.	7.30-9.30	B 23	R. McNamara	65
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NIGHT COURSE IN COACH TRIMMING.

FIRST YEAR.						
200	Coach Trimming	Mon., Wed.	7.30-9.30	B 1	G. O'Keefe	66
SECOND YEAR.						
201	Coach Trimming	Mon., Wed.	7.30-9.30	B 1	G. O'Keefe	66

MISCELLANEOUS COURSES.

202	*Land Surveying and Levelling. (See note below.)			C 8	A. M. McLoughlin.	20
203	Manual Instruction (Wood) ..	Mon.	7.30-9.30	B 22	H. O'Flynn	67
	Mech. Drawing and Design ..	Fri.	7.30-9.30	B 10	R. Grimes	68
204	Manual Instruction (Wood) ..	Thurs.	7.30-9.30	B 22	H. O'Flynn	67
	Mech. Drawing and Design ..	Fri.	7.30-9.30	B 10	R. Grimes	68
205	Manual Instruction (Wood)					
	Advanced	Wed.	7.30-9.30	B 12	J. A. Clarke	67
206	Manual Instruction (Wood) ..	Tues.	7.30-9.30	B 22	H. O'Flynn	67
	Mech. Drawing and Design ..	Fri.	7.30-9.30	B 10	R. Grimes	68
207	Manual Instruction (Wood) ..	Fri.	7.30-9.30	B 22	H. O'Flynn	67
208	Plan Drawing and Reading ..	Mon.	7.30-10.0	B 26	J. F. Cleary	69

SPECIAL CLASSES IN IRISH.

209	Irish—I.A.	Mon.	7.30-9.30	B 18	P. O'Riain	73
210	Irish—I.B.	Thurs.	7.30-9.30	B 18	P. O'Riain	73

* This class will start in March, 1941.

SYLLABUSES OF SUBJECTS.

1. ARCHITECTURAL DRAWING, I, II and III.

Use of instruments; freehand drawing of simple objects, furniture, features of buildings; memory drawing; ornament and architectural details from casts; construction and setting out of Greek, Roman and Gothic mouldings and their enrichments; piers and arch forms; tracery; scale and freehand drawing of the Orders; exercises in pattern and ornament; lettering and dimensioning; map drawing and tracing; shadow projection; monochrome and colour washes.

2. DESIGN, I, II, III, IV and V.

The course will consist mainly of working out set problems graduated in difficulty. The planning requirements of different types of buildings (commercial, municipal, ecclesiastical, etc.), and the general principles of planning and composition will be explained. Most of the subjects will be finished as rough sketch plans affording practice in the quick and effective presentation of ideas, some will be presented as finished sketch plans and a few as working drawings. Details of selected features will be worked out.

3. BUILDING CONSTRUCTION, I.

Concrete : Concrete in foundations, dwarf and rising walls, drain beds, sills and copings.

Foundations : Foundations and footings in ordinary soils; damp-proof courses. *Brickwork* : simple bonds in plain walling; sleeper walls; segmental and semi-circular gauged arches; kinds of bricks. *Masonry* : varieties of rubble and ashlar walling; plain work on sills; copings; characteristics of sandstones and limestones. *Carpentry and Joinery* : single floors; trimming; stud partitions; ordinary roofs, including king-posts trusses; ledged and braced and panelled doors; door frames and plain jamb linings; fixing of skirtings and architraves; cased frames and double-hung sashes; casement frames and sashes. *Slating* : terms used; cutting and fixing of slates; treatment at eaves and ridges. *Plumbing* : lead gutters and flashings. *Plaster-*

ing : composition of various coats; ordinary lathing and plastering of internal walls, ceilings and partitions.

TEXT BOOK.—Jaggard and Drury : Architectural Building Construction. Vol. I.

4. BUILDING CONSTRUCTION, II.

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

Foundations : Precautions in excavations; strutting and timbering; 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; construction of flat, elliptical and pointed arches; corbelling. *Masonry* : stone dressings; joints and fastenings; 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 40ft. span; preparing flat roof for plumbing; box and taper gutter; trimming around sky-lights, chimneys, etc.; self-supporting wood partitions; doors in hard and soft woods; framed and panelled linings; vestibule doors and frames; French casement windows; pivot-hung windows; sky-lights; dog-leg and open newel stairs. *Slating* : roof coverings, methods of fixing. *Plumbing* : leadwork on roofs, gutters and flats; joints used in plumbing. *Sanitary Work* : principles of sanitation, laying and jointing of pipes; connection with sewer; ventilation of drains; traps and gullies; testing of drains. *Plastering* : plasterers' work of all kinds, composition of materials. *Painting and Glazing* : properties and qualities of materials used in painting and glazing.

TEXT BOOKS : Jaggard and Drury : Architectural Building Construction. Vols. I, II and III.

5. BUILDING CONSTRUCTION, III.

Drawing : inking-in, tracing, colouring and lettering. *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; sewer construction; brick manufacture; terra cotta and artificial stones. *Masonry*: kinds of stones; their characteristics, chemical composition and suitability for different conditions; 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; open timber and other forms of roof trusses; dormers; turrets; windows; shutters; lantern lights; shop fronts; stairs; timber: characteristics, defects, conversions, seasoning, causes of decay, 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.

6. BUILDING CONSTRUCTION. IV.

House planning; production of complete drawings of a small building with simple specifications and working drawings; heating systems; ventilation; house sewage disposal; gas and electric lighting; fire proof floors; steel-work generally; the manufacture, characteristics and general uses and tests of materials; reinforced concrete work in stairs.

7. BUILDING CONSTRUCTION. V.

Reinforced concrete beams and floors, roofs, columns, chimneys, retaining walls, tanks, conduits, bridges, piles, etc., and calculations thereon; various well-known systems of reinforced concrete construction; materials and specifications. Tests of cements and other materials; road construction.

Text Books for Building Construction III, IV and V as for Building Construction II.

Book of Reference: Principles of Modern Building (Dept. of Scientific and Industrial Research).

8. MATHEMATICS. I.

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.

9. MATHEMATICS. II.

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.

10. MATHEMATICS. III.

Multiplication and division of decimals, square and cube root, ratio and variation. Areas of plane figures, Simpson's rules, area and volume of cone, cylinder and sphere. Fractions and partial fractions; simple, simultaneous and quadratic equations; indices, logarithms, use of slide rule. The straight line and other simple graphs. Radian measurement, functions of angles, simple formulæ, use of tables, solution of triangles, vectors. Mass, weight, centre of gravity, work, power, velocity and acceleration.

Graphical solution of equations of degree higher than the second; maximum and minimum values of quadratic and cubic expressions, logarithmic solution of equations. Applications of Simpson's trapezoidal rules. General solution of triangles, formulæ for sine, cosine and tangent of sum or difference of two angles, formulæ for sum or difference of sines or cosines of two angles. Slope of a curve at a point and its interpretation, rate of increase, velocity and acceleration, area of a curve and its interpretation.

Binominal expansions and approximations. Exponential and logarithmic theorems, calculations of logarithms to the exponential base and their transformation to a decimal or other base. Tabular

study of the rate of increase and graphical study of the slope of curve of simple functions of a varying quantity, *i.e.*, powers, trigonometrical, logarithmic and exponential functions. Differentials of such simple functions; of their sum, difference of product, and the function of a function. Successive differentiation and determination of the maximum and minimum values of a function. Integration as a process of summation, and as the inverse of differentiation. Differentiation and integration applied to beam calculations.

11. PRACTICAL GEOMETRY. I.

Construction and use of scales; plotting of angles by protractor; division of lines in giving proportions; measurement of angles in degrees; construction of a triangle from given data; construction of polygons; similar figures; enlarging and reducing figures by radial projection; areas of triangles, polygons and curved figures; construction of circles from specific data; tangents; methods of defining positions in space of points and lines, projection of simple solids.

12. PRACTICAL GEOMETRY. II.

Sine, cosine and tangent of angles; their values by graphical methods; plotting angles by trigonometrical tables; angles in segment of a circle; points, lines and planes in space; horizontal and vertical projections; horizontal and vertical traces; inclination of lines and planes to planes of projection; projections of prism, pyramid, regular tetrahedron; sphere; right circular cylinder and cone.

13. PRACTICAL GEOMETRY. III.

The ellipse; development of surfaces; section planes; auxiliary projection planes; tangent planes; simple interpenetrations; isometric projection.

14. GEOMETRY, MATHEMATICS AND MECHANICS.

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 charac-

teristics 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.

15. APPLIED MECHANICS (STRENGTH OF MATERIALS AND THEORY OF STRUCTURES). III.

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; stresses in frame structures; dead load and wind pressure diagrams; stress and strain; elastic limits; elastic constants; working stresses; factors of safety; the testing of materials; 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 inertia; section modulus; strength of beams of standard sections; combined bending and direct stress; common examples of eccentric loading; pillars; various forms of stanchions and built-up struts; the use of pocket-books in the choice of sections.

16. APPLIED MECHANICS (STRENGTH OF MATERIALS AND THEORY OF STRUCTURES). IV. & V.

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; deflection of beams; 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, chimneys; safe pressure on foundations; distribution of pressure; the importance of wind pressure in lofty structures; reinforced concrete calculations.

20. SURVEYING AND LEVELLING.

Surveying with the Chain : equipment, ranging and measuring a line, simple surveys, arrangement of survey lines, triangulation, booking the survey, methods of dealing with surveys of average extent, various field problems and operations. Traversing with the Chain, setting out curves.

Ordnance Survey plans, scales, conventional symbols.

Levelling : the dumpy and tilting levels, simple and compound levelling, booking and reduction of levels; datum, bench marks, sections, contours, permanent adjustments of the level.

Magnetic compass, declination, bearings.

Surveying with the Theodolite : the vernier; measurement of horizontal angles, traversing with the theodolite; methods of plotting, co-ordinates.

Calculation of Areas : method of triangles, planimeter, computing scale.

21. SCIENCE.

General Physics : measurements of length, area and volume; density; force; weight; centre of gravity; moments; simple machines; pressure in liquids; atmospheric pressure; pumps; siphons. *Heat* : expansion; temperature measurement; calorimetry; calorific value of fuels; specific heat; change of state; latent heats; conduction, convection and radiation. *Light* : reflection from plane and curved surfaces; real and virtual images; refraction; lenses; optical instruments; spectrum. *Electricity and magnetism* : magnets, magnetic flux and magnetic fields; electric current and its magnetic field; ammeters and voltmeters; rheostats; Ohm's law; measurement of resistance; induced currents; induction coil; dynamos and motors. *Chemistry* : combustion; oxygen; nitrogen; hydrogen; chlorine; water; acids; alkalis; salts; chalk; lime; carbon dioxide; carbon monoxide; hydration; cement; concrete.

22. BUILDERS' QUANTITIES.

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. *Concretor and 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 and casing; floors; roofs; partitions; windows; doors, staircases, etc. *Iron-founder and Smith* : reinforcing bars and fabric; pipes; beams and gutters; rolled steel joists and stanchions; 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; 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.

23. BUSINESS METHODS AND ECONOMICS.

Book-keeping : recording transactions in books of original entry; analytical and columnar forms; posting, balancing and closing ledger

accounts; extraction of trial balance; trading account; profit and loss account; balance sheet. *Business methods* : purchase and sale in inland market; postal arrangements; telegraphs and telephones; office books and business forms; banks; opening an account; ordinary transactions; different kinds of account; cheques; drawing, crossing, endorsing, presenting, dishonour, stopping; constitution of business units; sole traders; partnerships; limited companies; Stock Exchange; machinery; brokers and jobbers; bull and bear operations; contange and backwardation; options; the settlement; insurance; commercial terms and abbreviations. *Economics* : economic laws; production and consumption; wealth; utility; agents of production; supply and efficiency of labour; division of labour; land; law of diminishing returns; capital; organisation and the entrepreneur; advantages of large- and small-scale production; joint stock enterprise; combination and monopoly; theory of value; laws of supply and demand; methods of remuneration; theories of wages; rent; unemployment; Trade Union movement; nature and functions of money; paper money; credit and banking; protection and free trade; public revenue and expenditure; taxation; public debts. *Commercial Law* : law of contract; formation of a contract; capacity of parties; form and consideration; legality and possibility; mistake; misrepresentation and fraud; rights and obligations; discharge of a contract.

28. BRICKLAYING PRACTICE. I.

Bonding in walls of various thicknesses; preparation of foundation and footings; damp-proof courses; vents; laying and jointing of drain pipes; pointing brickwork in various ways; cutting of simple arches; cutting the skewback; simple weathering to buttress corbelling; junctions of walls; plain tiling.

29. BRICKLAYING DRAWING AND THEORY. I.

Bricks : Essentials of ordinary building bricks; well-known varieties; practical tests; weight and dimensions. *Mortars* : cements, limes, sand and other ingredients; proportion; 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 terms used; function of mortar; effect of thickness of joints; strength and

durability; approximate costs. *Bonding*: necessity for bond; systems of bonding; value of these systems. *Pointing*: various methods; advantages and disadvantages of the different methods; composition of pointing mortars. *Brick Arches*: object of arches; types; bond in arches; setting out of the various types. *Elementary Principles of Statics as affecting Brickwork*: calculation of weight; determination of pressure. *Measurement*: excavation; concrete and brickwork in foundations and footings; material required for a piece of work; geometry as applied to bricklayers' work.

30. BRICKLAYING PRACTICE. II.

Bonding: Bonding in obtuse and acute angles; rebated jambs; special and broken bonding; hollow walls; curved walls; cutting and bonding in elliptic and other arches; cutting 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 pieces of gauged face-work*; use of moulded bricks in panels, string-courses and cornices; 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 prices of brickwork from architectural drawings.

31. BRICKLAYING DRAWING AND THEORY. II.

Bricks: essentials of facing bricks; method of testing; hand-made and machine-made bricks; well-known varieties. *Mortars and Concrete*: more intimate knowledge of these materials; effect of frost and rapid drying; waterproofing; steel reinforcement. *Bonding*: obtuse and acute angles, reveals and jambs; special bonding; broken bond; bonding in hollow walls and curved walls; copings; cutting to gables and 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; 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 soils and safe loads; measuring the work comprised in the foregoing; geometry as applied to bricklayers' work.

32. BRICKLAYING PRACTICE. III.

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.

33. BRICKLAYING DRAWING AND THEORY. III.

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, cut-stone cornices, joints, means of fastening; lintels, etc.; tracery windows, etc.

34. STONECUTTING. I AND II.

Geometry : simple examples of the application of plane and solid geometry to masonry; terms used in masonry; use of scales. *Mouldings* : names and descriptions; enlarging and diminishing. *Archès* : historical development; setting out. *Moulds* : preparation of moulds; mensuration applied to masonry. *Walls* : rubble, ashlar and composite; securing same against damp. *Windows* : mullioned and corbelled. *Stairs* : straight and geometrical; joints 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* : selection, 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.

35. CARPENTRY AND JOINERY PRACTICE. I.

Examples to suit students' abilities will be chosen.

36. CARPENTRY AND JOINERY PRACTICE. II.

Examples to suit students' abilities will be chosen.

37. CARPENTRY AND JOINERY DRAWING AND LECTURE. II.

Choice and preparation of scales; joints and fastenings; oblique and isometric projection of common joints; simple forms of centres, turning pieces, rib centres; segmental and elliptical centres; common floor joisting; common floor coverings; trimming around chimney breasts and well-holes; couple roof; collar brace roof; king-post truss; setting out common mouldings; door frames and jamb linings; braced and sheeted and four panelled doors; 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.

38. CARPENTRY AND JOINERY PRACTICE. III.

Examples to suit students' abilities will be chosen.

39. CARPENTRY AND JOINERY LECTURE AND DRAWING. III.

Panel doors of various kinds; jamb linings and solid door frames; diminished style doors; swing doors; double-margin doors; framed, ledged and braced doors; yard gates; cased frames and double-hung sashes; casement frames; French windows; pivot-hung sashes; hospital light; circular-headed sash frames, cased and solid; partitions, common and trussed; king-post truss; queen-post truss; mansard truss; bevels for oblique work generally; roof bevels; length and bevels for hip, valley and jack rafters; roof bevels for purlins; backing for hips and valleys; strength of joists and beams; single, double and framed

floors; trimming around hearths, etc.; dog-legged stairs; open newel and geometrical stairs; circular louvres; nature and properties of timbers; raking, flying and dead shores; exercises in the use of the steel square.

TEXT BOOK.—Wilson : Carpentry and Joinery.

BOOKS OF REFERENCE.—G. Ellis : Modern Practical Carpentry and Modern Practical Joinery.

40. CARPENTRY AND JOINERY PRACTICE. IV.

Examples to suit students' abilities will be chosen.

41. CARPENTRY AND JOINERY LECTURE AND DRAWING. IV.

Roofing of difficult plans, cuts and bevels; open timber roofs; hammer-beam and collar-beam trusses of special form, groin roofs; turret roofs, circular and polygonal; niches; lantern lights; centres for large spans; elliptical, segmental, etc.; raking and horizontal shores and shoring for shop fronts; timber bridges; platform gantry and scaffolding; traveller gantry; derrick tower gantry; geometrical staircase; staircase details and ornamental finishings; wreath for quarter circle stair; wreath for half-turn stair; wreath for quarter space of winders; wreath for scroll shank; solid mullioned, single and double boxed, venetian sash frames; balancing shutters; boxing shutters; joinery fittings; cupboards, enclosures, etc.; door frames, with radiating and with parallel jambs; circle-on-circle; cased frames and sashes; shop fronts, with roller shutters and sun-blind; air-tight show cases; floor cases and wall cases; counter cases, square- and round-ended; exercises in the use of the steel square; wood-working machinery; planer, spindle, circular saw and band saw.

TEXT BOOK.—Wilson : Carpentry and Joinery.

BOOKS OF REFERENCE.—G. Ellis : Modern Practical Carpentry and Modern Practical Joinery.

42. PLUMBERS' WORK LECTURE AND DRAWING. I.

Elementary Science: effect of heat on solids, liquids and gases; cause of frost burst, and methods of preventing it; effect of heat in

causing motion in liquids and gases; hot water circulation and the ventilation of pipes; thermometers; measurement of quantity of heat; relation of quantity of heat applied to rise of temperature in air, water, lead, zinc and other substances used in plumbers' work; properties and composition of air and water. *Alloys, Solders, etc.*: alloys used for valves and cocks; solders; fluxes; methods of soldering; blow-pipe, copper-bit, wiping, etc.; advantages of lead burning. *Workshop Appliances*: the lever, pulley block screws; behaviour of lead under great pressure; pressure due to action of liquids and gases; head of water; water seal; the syphon; traps and valves. *Tools*: their forms, uses, etc.; fitting up and equipment of workshop; pipes used in plumbing. *Calculations*: duo-decimals, mensuration of plane figures; areas of sloping and curved roof surfaces; pyramidal, conical and spherical roof covering; estimating quantity and cost of materials; capacities of pipes, tanks, boilers, cylinders, etc. *Geometry*: application of geometrical construction to cutting out sheet metals for covering dormers, gutters, lantern lights, etc.; development and interpenetration as applied to pipes, ventilators, roofs, vessels, etc.; projection; plans, elevation, sections, and details of pieces of work in plumbing, sheet metal work, etc.

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.

43. PLUMBERS' WORK PRACTICE. I., II., III. AND IV.

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.

44. PHYSICS AND CHEMISTRY FOR PLUMBERS. I.

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*: 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 heat; change of volume resulting from change of state; the spheroidal 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.

45. PLUMBERS' WORK LECTURE AND DRAWING. II.

Properties and Uses of Materials: strengths, under pressure, 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.; jointing sheet lead by rolls, welts, drips and passings; development of surfaces; making of working drawings. *Hot Water Apparatus*: principles of hot water circulation; cylinder and tank systems; boilers and taps; valve seatings, packing, etc., 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*: hydraulic press; 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.

46. PLUMBERS' WORK LECTURE AND DRAWING. III.

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 in channels and pipes; calculations of velocities. *Hot Water and Heating* : obtaining large supplies; heating by hot water and steam; high and low pressure systems; sizes of pipes and boilers; radiating surfaces for heating; heating surfaces of boilers. *Ventilation* : systems of ventilation for private dwellings and public buildings. *Drainage* : setting out house drainage; sewers; storm overflow; sewerage gas and ventilation of sewers; sewage disposal for isolated country houses; testing drains and waste pipes; arrangement and fitting of sanitary appliances. *Plans and Specifications* : preparation of specifications and quantities, making of working drawings; measuring work. *Bye-Laws* : Local Authorities' Bye-Laws and Regulations.

TEXT BOOK.—S. S. Hellyer : Principles and Practice of Plumbing.

BOOKS OF REFERENCE.—As for Second Year Course.

47. PLUMBERS' WORK LECTURE AND DRAWING. IV.

Taking out quantities from plans; setting out to scale of coverings for domes, turrets and finals, making and fixing of wrought and cast lead, R.W. heads and pipes. *Chemical Plumbing* : description and manufacture of materials and plant such as acid chambers, tanks, acid eggs, making of pipe coils; method of supporting same, etc.; steam heating and cooking, steam traps, valves, pressure gauges, injectors, etc. *Gas Fittings* : the properties of gases used for illuminating and heating; fixing of gas cookers, gas fires and radiators; and gas-heated boilers and circulators for domestic hot water supplies; ventilation of gas-heated appliance.

48. LEAD BURNING, COPPER AND BRONZE WELDING BY OXY-ACETYLENE PROCESS. THEORETICAL INSTRUCTION.

General principle of autogenous welding; chemistry of oxy-acetylene flame; theoretical proportions in welding flame and the proportions required in practice; effect of incorrect proportions; essential apparatus; high-pressure and low-pressure plants. *Oxygen* : physical

and chemical properties; manufacture; impurities and their effects. *Acetylene*: physical and chemical properties; dissolved acetylene; generators; purifiers; hydraulic valve precautions; *Cylinders*: construction; valves; compression pressure; effects of temperatures; measurement of contents; manipulation and precautions; avoidance of lubricants; water in oxygen cylinders; leaky valves; grit; testing; sizes obtainable; approximate prices; trade conditions of sale; transport. *Welding Blowpipes*: principle; high-pressure types; construction of essential parts; inter-changeable nozzles; regulating gases; manipulation and care; adjustment of flame. *Regulators*: pipes and tubing; appliances for holding work; accessories; preheating appliances; welding machines. *Suitability of Work*: applications of process; preparation of work; preheating; hammering and annealing. *Welding*: general procedure; common faults; testing welds; expansion and contraction; welding-rods and flues; welding of various metals; speed and cost of work.

PRACTICE.

Examination and setting up of high-pressure welding plant; regulation of pressure and manipulation of valves; measurement of contents of cylinders; preparation of materials; precautions against the effects of expansion; welding of various metals; treatment of work after welding; testing welds.

49. PLASTERERS' DRAWING. I, II, III AND IV.

Use of instruments; scales; simple problems in plane and solid geometry with application to Plasterers' work; freehand sketches from models; dimensioned sketches of plasterwork details; preparing working drawings from sketches; setting out arches—plain and moulded; mouldings and their enrichments; the classical Orders; cornices and pediments; capitals; bases; panelled beams, wall and ceiling surfaces; enlarging and diminishing mouldings by radial projection; vaulted ceilings; pattern construction; isometric projection.

50. PLASTERERS' WORK PRACTICE AND THEORY.

I, II, III AND IV.

Arithmetic: The four rules; simple and compound proportion, percentages, averages; measurements of simple figures and solids; simple

trade accounts; rates; insurance; measuring plastering trade quantities. *Materials*: materials used in plastering, their properties and uses; chemical changes during manufacture and use; limes; rich and poor limes; making, slaking and testing limes and making mortar for various purposes; plaster of Paris; plaster substitutes, Keen's, Parian, Sirapite, and asbetic plasters, and the purposes for which each is used; natural and artificial cements; gauging, testing and using Portland, Roman, Medina, white and slag cements; mixtures of limes, plaster and cements; other materials used in plastering, sands, hair, laths, oil, mastic and water-proofing compounds.

Tools; lathing internal walls, ceilings and partitions; bracketing; preparing brick and stone walls for plaster; 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; running and mitreing mouldings of all kinds; pediments; panelled ceilings; 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. *Quantities and Estimating*: Measuring work, materials required for given areas, simple bills of quantities; estimating.

51. MODELLING. II, III AND IV.

Management of clay; 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.

52. PAINTERS' AND DECORATORS' WORK. I.

Object in painting surfaces; principles underlying the use of paints; brushes and other tools; the principal pigments; thinners and driers; preparation of grounds; plain painting; simple mixing and application; distemper; graining and the preparation of grounds; sign writing and

lettering; styles of lettering; 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.

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

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 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.

54. PAINTERS' AND DECORATORS' WORK. II.

Composition of painters' brushes; use of plant and appliances; oils and dilutents; 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 hanging relieve materials; artistic use of graining and marbling; grounds and methods of working; graining of different woods; notice and advertising lettering; elaboration and emphasising of lettering, flatting, enamelling, etc.; woods suitable for staining; preparation and application of stains; faults in varnishing; mixed tints and colours; general hints on paint mixing.

55. PAINTERS' AND DECORATORS' WORK. III AND IV.

Selection of plant and tools; the testing of steps, ladders, etc.; scaffolding for painters; testing colours, pigments, oils, turpentine and driers; quantities for given work; action 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 painters' work, quantities and pricing.

56. CABINET-MAKING DRAWING AND LECTURE. I.

Nature, properties and sources of woods used in cabinet-making; most suitable woods for construction, groundwork and veneers; seasoning and preparing for use; tools; plain joints: dowelling, tonguing, dovetailing; setting out and constructing mouldings; 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; measuring and setting out shaped window seats, cornice poles and drapery laths; fitting up and completion of furniture for the showroom.

TEXT BOOK.—Wells and Hooper: *Modern Cabinet Work*.

57. CABINET-MAKING PRACTICE. I.

Tools: principles underlying their construction; sharpening and using; making of joints including dowelling, tonguing, 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; affixing hinges, joint stays, bolts and locks; fitting up furniture for the showroom, including methods of fastening glass; affixing cornice poles, window seats and cosy corners.

58. CABINET-MAKING DRAWING AND LECTURE.

II, III AND IV.

Properties of woods used, their suitability for decorative work, their diseases; mechanical actions, such as are used in cylinder fall desks, writing tables, dumb waiters, etc.; methods of expanding dining tables; cabinet brass work: hinges, joint stays, bolts and locks;

methods of fixing; inlaying and veneering with tortoiseshell, ivory, mother-of-pearl, and metals; applying veneers to flat and sweep work; styles of furniture and the periods to which they belong; joints: plain cooper dowelling, tongueing and dovetailing, secret lap and secret mitre dovetailing; method of setting out; construction of working drawings from student's own designs.

TEXT BOOK.—Wells and Hooper: Modern Cabinet Work.

59. CABINET-MAKING PRACTICE. II, III AND IV.

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.

TEXT BOOK.—Wells and Hooper: Modern Cabinet Work.

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

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.

61. WOOD CARVING. I, II AND III.

Tools used; sharpening of tools; stones employed; woods; treatment of the different woods; the effect of grain; setting out and starting a piece of work; stages in working 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; simple panels from

casts; conventional foliage in different styles from cast; natural forms of foliage; geometrical patterns and freehand ornament in their application to furniture and architectural work; historic styles of ornament; examples of architectural treatment; carvings as applied to furniture; individuality of style explained and examples given.

62. FRENCH POLISHING. I AND II.

The art of French polishing; manufacture and use of stains and polishes; colouring and lacquering; varnishing and glazing; gums; colours; 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.

63. WOODCUTTING MACHINERY. I, II AND III.

Construction of scales and their use; measurement and construction of angles; simple working drawings; setting out pieces of joinery and cabinet work on rods preparatory to machining; preparing cutting lists; drawing joints used in construction of 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; common mouldings and 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; the use of safeguards as laid down by the Minister of Industry and Commerce; 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.

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

Construction of scales and their use; timber used; measuring and valuing; seasoning; the use of bent timber; iron and steel: forging and welding; precautions when forging or tempering iron and steel; aluminium and other metals used for panels, wings, etc.; designing carts, wagonettes, carriages, open or closed, and motor bodies; designing, drawing and making joints in coach-building; under-carriages; wheels with wooden spokes, including artillery patterns; sections of hubs, spokes and tyres, channels, pneumatic tyres, etc.; spring making; 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; workshop appliances and machinery; designing all kinds of motor bodies; making working drawings; calculating the sizes of wheels, springs, axles and the quantity of timber required; writing out workshop orders; specifying and estimating the cost of repairs; principles of costing; remedying of defects such as noise or vibration; making folding hoods and seats, movable canopies, etc.

65. COACH PAINTING. I AND II.

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.

66. COACH TRIMMING. I AND II.

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.

67. MANUAL INSTRUCTION (WOODWORK). I AND II.

Drawing: simple projection, as required for the working drawing of each model. *Woodwork*: planing, sawing and chiselling; making of joints; models of a useful nature, involving the use of these joints.

Theory : construction of the tools, grinding and sharpening of edged tools. *Timber* : woods in common use, growth, sources of supply, nature and properties; seasoning.

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

68. MECHANICAL DRAWING, PATTERN CONSTRUCTION AND GEOMETRICAL DESIGN.

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 be made to the application of geometry to industrial art. The exercises will include the drawing of geometrical patterns; spacing of surfaces for decorative purposes; bands and borders; units of pattern; diapers; the construction of arch-forms; tracery and mouldings; projection of simple solids.

69. CLASS IN PLAN DRAWING AND READING.

Drawing instruments, setting out and arrangement; construction and use of scales; lettering; use of protractor; segmental and elliptical curves; simple scale drawing of plans, elevations and sections of small buildings; drawing site maps; large scale details of construction; exercise in tracing, inking and colouring.

70. ENGLISH.

Reading : reading from a text book on building subjects; meanings of words; spelling. *Letter Writing* : the essential of good letter writing; forms of address. *Writing Reports and Descriptions* : preparing the outline of a report on building work; matters with which the report should deal; how to describe simply and tersely.

71. WORKSHOP ARITHMETIC.

Units; units of area; simple fractions; decimals; area of triangle, rectangle, irregular quadrilaterals, walls of room, sides of tank, etc.; the circle, circumference, area, etc.; volumes and weights of rectangular solids, cylinders, etc.; capacity of tanks, cylindrical pipes; surface area of cone, pyramid and cylinder; proportions by unitary method; percentages; square root; calculating costs from areas and volumes.

72. DRAWING.

Drawing instruments; setting out and arrangement; plain scales; scale drawing; the protractor; decimal scale; drawing quadrilateral figures, cutting out in paper and finding area; square root and its graphical representation; relation of diameter of circle to circumference; area of circle; areas of similar figures; elliptic and segmental curves; drawing in three dimensions; plans, elevations, and sections; simple development of surfaces; isometrical representations of solids.

73. IRISH.

Oral: Conversation lessons on simple matters such as the following: Name, home or residence, salutations, the clock, days of the week, months and seasons, the weather, money, easy counting, colours, etc. Location of objects in the classroom and neighbourhood, parts of the body and clothing, giving and carrying out simple orders. With the conversational lessons the student will be familiarised with the use of *is* and *tá* and of verb forms.

Memorising of simple songs, rhymes, stories, etc. Stories and recitations by Gaelic authors.

GENERAL CURRICULUM OF THE SCHOOLS

UNDER THE CONTROL OF

THE CITY OF DUBLIN VOCATIONAL EDUCATION COMMITTEE.

BOLTON STREET TECHNICAL SCHOOL.

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

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

KEVIN STREET TECHNICAL INSTITUTE.

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

PARNELL SQUARE TECHNICAL INSTITUTE.

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

Day School of Commerce.
Day Technical Course (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.	Mechanical Engineering.
Retail Distribution.	Motor Car Engineering.
Languages.	Oxy-Acetylene and Electric Welding.
Domestic Science and Housecraft.	Woodworking Trades.
Art and Art Crafts.	Day School of Commerce.
	Day Junior Technical School (Boys)
	Day Technical Course (Girls).
	Special Apprentice Training Courses.

RATHMINES TECHNICAL INSTITUTE.

General Commercial Subjects.	Banking, Finance and Foreign Ex- change.
Accountancy, Auditing and Allied Subjects.	Company Secretaries.
Insurance.	Government Accountancy and Finance.
Advertising and Publicity.	Languages.
Physical Training.	Domestic Science and Housecraft.
	Day School of Commerce.
	Day Technical Course (Girls).

MARINO TECHNICAL INSTITUTE.

General Commercial Subjects.	Metalwork.
Languages.	Science.
Domestic Science and Housecraft.	Woodwork.
Physical Training.	Day Junior Technical School (Boys and Girls).
	Day School of Commerce.

CHATHAM ROW SCHOOL OF MUSIC (Day and Evening Classes)

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

Offices—

TECHNICAL INSTITUTE,
BOLTON STREET,
DUBLIN.

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