16-4136-50A

REORGANIZED PROGRAMS SUBDIVIDED INTO COURSES

SECTOR: HYDROTHERMICS
800-000

020801
7687004

Québec

F O R E W O R D

This document describes the existing programs of study in terms of how they will be reorganized as of September 1987, when the vocational education sections of the **Regulation Respecting the Basis of Secondary School Organization**, as amended by government decree on December 10, 1986, will come into effect.

The new organizational framework will in no way affect the official or experimental status of these programs.

However, the present grouping of certain programs into the branch leading to a Secondary School Vocational Diploma (SSVD) may be reexamined once the criteria for classification into either one of the two basic branches (SSVC or SSVD) have been established and all necessary consultation has been completed. Clearly, any students who have already begun their studies in the branch leading to a Secondary School Vocational Diploma will be able to complete their studies in this branch.

INTRODUCTION

This document covers the programs listed in Handbooks 02 and 04 and those labelled "Revised Version" which pertain to the branch leading to a Secondary School Vocational Diploma. Only the programs currently being offered have been reorganized.

These programs have been divided into several courses. Their content and objectives remain unchanged, except in a few cases where adjustments were necessary in order to incorporate the new organizational framework for vocational education.

This document has three sections:

1. **Changes to the Regulations Respecting the Basis of Secondary School Organization**

   This section describes the basic changes adopted by the Québec government in December 1986.

2. **The New Organizational Framework For the Programs**

   This section outlines the overall aim of the reorganization of the programs, the characteristics of the reorganized programs and the general model for the presentation of these programs.

3. **The Reorganized Programs**

   This section lists the reorganized programs for each vocational sector. It also describes the particular features, if any, of certain programs that differ in their presentation, content or mode of instructional organization. Finally, it gives a breakdown of the reorganized programs themselves.

1. CHANGES TO THE REGULATION RESPECTING THE BASIS OF SECONDARY SCHOOL ORGANIZATION

The Regulation was amended by the Government in December 1986. The amendments adopted define the admission requirements for the vocational education programs and make substantial changes to the organizational framework for vocational education as well as to the rules regarding certification of studies.

In terms of organization, the Regulation introduces two basic branches of study: one leading to a Secondary School Vocational Diploma (SSVD) and the other to a Secondary School Vocational Certificate (SSVC). It also introduces a complementary branch which leads to an Attestation of Vocational Specialization (AVS). The branch leading to a SSVD will be made avaible to students as of September 1987. The two other branches will be open as of September 1988.

The programs leading to an SSVD are full-time vocational education programs which entail either 900, 1 350 or 1 800 hours of study. The programs in this branch do not include any general education courses, as was the case with the long-vocational programs.

The specific rules for the certification of studies in vocational education have been modified in such a way that a student must now earn credits for each course of a given program in order to receive either of the two certification documents for vocational studies. These rules also imply the evaluation of the student's learning in each course of a program.

2. THE NEW ORGANIZATIONAL FRAMEWORK FOR THE PROGRAMS

2.1 Aim

The new rules for the certification of studies in vocational education stipulate that all programs must be presented in the form of courses. These rules will be applied to the branch leading to a Secondary School Vocational Diploma as of September 1987.

Neither the programs listed in Handbook 02 (1977-1979) and in the English equivalent, Handbook 04 (1977-1979), nor the programs labelled "Revised Version" meet the requirements of the new rules for the certification of studies because these programmes are not made up of courses. The purpose of reorganizing the programs is thus to make them conform to the new rules applicable to the certification of studies by dividing the content of each program into several courses. A credit value is assigned to each course and is determined by the duration and level of difficulty of the course.

2.2 Characteristics of the Reorganized Programs

a) The reorganized programs comprise full-time vocational education studies and do not include any general education courses. The total number of teaching hours corresponds to the length of time allotted to the program in question.

b) The reorganized programs combine the common core courses and the specialized courses of the currently existing programs. Each reorganized program is identified by its area of specialization and bears a new four-digit code.

c) The duration of the new programs is set at 900, 1 350 or 1 800 hours. The majority of them are 1 350 hours long. The existing programs are being reorganized (divided into courses) and extended from 1 200 to 1 350 hours. A few have been reduced to 900 hours because their current content does not justify the time formerly allocated to them.

d) Most of the programs which have been extended to 1 350 hours do not include any additional content or objectives. The 150 additional hours have been distributed among the different courses for the purpose of facilitating the evaluation of the student's learning, which must be done for each course.

e) The number of credits assigned to each course conforms with the definition of a credit based on 15, and not 25, hours of activities. A course can therefore be 15 hours in length or any multiple thereof, up to a maximum of 120 hours.

f) The courses are offered on the basis of the semestrial school calendar, whereby each semester comprises 450 course hours. This is not a compulsory model for scheduling, but in most cases it serves to facilitate instructional organization.

g) Some of the courses will span one or more semesters, but the final evaluation of learning must take place at the end of the course only. The teacher must take the end of the school year into account when organizing the learning activities for the course.

2.3 General Model of Presentation

All the reorganized programs are presented according to the same general plan.

a) All the reorganized programs within a given sector are grouped in the same document.

b) A complete list of the courses in a given program, arranged on the basis of a 450-hour semester, is presented at the beginning of every reorganized program. This list provides the following information:

- the new program code;
- the title of the program;
- the length of the program in hours;
- the number of credits assigned to the program.

The list also provides the following information for each course:

- the new course code (applicable in most cases);
- the title of the course;
- the length of the course in hours;
- the semester in which it is recommended that the course be given.

c) The programs themselves are presented in terms of their component courses, with two categories of entries listed in two columns for every course. The course title and the total duration of the course in hours are indicated at the top of each two-column table.

d) The format for presenting the course content varies, depending on the program involved. Examples of the two types of format used are presente below.

COOLING SYSTEMS		30 hours (1)
	Content	**Content (version améliorée)** (6)
(2)	Cooling Systems (820-616) Inspecting and Servicing the Cooling System (820-224) Cooling System Accessories	Entretien du système de refroidissement (341-118) (4) Système de refroidissement du moteur (347-111) (5)
(3)	(820-225)	**Main Focus of Evaluation**
		Remove and replace a thermostat Remove and replace a water pump

(1) Course title and course duration in hours;
(2) Titles of the program modules as listed in Handbook 04.
(3) Codes of the program modules as listed in Handbook 04.
(4) Titles of the program modules as listed in the "Version améliorée" (Revised version).
(5) Codes of the program modules as listed in the "Version améliorée" (Revised version).
(6) Specifications regarding the focus of evaluation. For some programs, this space will be left blank and teachers can write in their own notes on the focuses of evaluation.

ANATOMY AND PHYSIOLOGY I		30 hours (1)
	Content (Handbook 04)	**Course Objectives (4)**
(2) (3)	Anatomy and Physiology (640-207)	Distinguer les composantes de la structure normale de l'organisme humain (cellules - tissus - organes - systèmes) Distinguer les composantes: de la fonction de relation - systèmes locomoteur, nerveux et sensoriel; de la fonction de génération - système reproducteur Décrire le fonctionnement des systèmes: locomoteur, nerveux, sensoriel, reproducteur Utiliser le vocabulaire spécifique

(1) Course title and course duration in hours;
(2) Titles of the program modules as listed in Handbook 04.
(3) Codes of program modules as listed in Handbook 04.
(4) Course objectives: This section covers the objectives of the module. It is intended to help the teacher delimit the content of the module as it is outlined in Handbook 04. These objectives also serve as indicators for evaluation.

3. THE REORGANIZED PROGRAMS SUBDIVIDED INTO COURSES

3.1 List of Reorganized Programs

The Hydrothermics sector consists of 2 programs which have been reorganized

1717 **General Welder** (old codes 801-400/808-500) 1 350 hours, 90 credits
1730 **Pipe Fitter** (old codes 802-400/811-500) 1 350 hours, 90 credits

3.2 Specifications

The program Pipe Fitter is not translated and may be offered in french.

PROGRAM: GENERAL WELDER

S.S.V.D. 90 credits

COURSE LIST

First semester: 30 credits	Hours	Credits
Technical Drawing	90	6
Industrial Safety and Metall.	45	3
Tools	105	7
Mov. Mat. Eq., Susp. Anch.	30	2
Sheet Metal Equip. and Layout	60	4
OAW and Brazing	90	7
Welding Machines	15	1

Second semester: 30 credits	Hours	Credits
SMAW Process, Wel. Pre. and Sup.	90	6
OAW, Ferrous Metal and OA Surf.	45	3
OAW, Alloy Steels	45	3
OAW Struct., Cast Iron, Pipes	45	3
Making of Pipe Fittings	45	3
OAW Non-Ferrous Metals	30	2
SMAW Surfacing	30	2
SMAW, Steels, Th. Treatm.	45	3
SMAW, Cast Iron, M. St. Pipes	75	5

Third semester: 30 credits	Hours	Credits
SMAW Non-Ferrous Metals	30	2
Automatic Oxy. Cutting	30	2
GTAW, Surfacing, Alloy Steels	90	6
Elec. Arc Cut. and GTAW Proc.	105	7
Automatic Welding Processes	15	1
GMAW Surfacing, Alloy Steels	90	6
GMAW, Thin and Non-Ferr. Met.	90	6

SECTOR: **HYDROTHERMICS**
PROGRAM: **GENERAL WELDER**
PROGRAM LEADING TO SECONDARY SCHOOL VOCATIONAL DIPLOMA: (SSVD)
DURATION OF PROGRAM: 1 350 heures
TOTAL NUMBER OF CREDITS: 90 credits

TECHNICAL DRAWING	90 hours
Content (Handbook 04)	**Content**
Basic Drafting Techniques (810-450) Orthogonal Projections (810-458) Applied Dimensioning (810-462) Sketching (810-466) Sectionning (810-470) Auxiliary Views (810-474) Mechanical Assembly Drafting (810-478) Basic Symbols (750-302)	

INDUSTRIAL SAFETY AND METALL.	45 hours
Content (Handbook 04)	**Content**
Industrial Safety (750-201) Metallic Fabrication Materials (750-207) Foundry Notions (750-222)	

TOOLS	105 hours
Content (Handbook 04)	**Content**
Measuring & Tracing Instruments (750-202) All purpose Hand Tools (750-204) Mechanical Tools (750-205) Cutting Tools (750-206)	

MOV. MAT. EQ., SUSP. ANCH.	30 hours
Content (Handbook 04)	**Content**
Handling (750-209) Suspension and Anchorage (750-210)	

SHEET METAL EQUIP. AND LAYOUT	60 hours
Content (Handbook 04)	**Content**
Machine Tools - Sheet-Metal Manufacturing (750-211) Sheet-Metal Making of Basic Elements (750-212)	

OAW AND BRAZING	105 hours
Content (Handbook 04)	**Content**
Oxy-Acetylene Welding Set-Up (750-213) Oxy-Acetylene Cutting (750-214) Tin Welding (750-215) Braze Welding (750-216) Brazing Elements (750-220) Fundamentals of Oxy-Acetylene Welding of Mild Steel (750-221)	

WELDING MACHINES	15 hours
Content (Handbook 04)	**Content**
Welding Tools (750-247)	

SMAW PROCESS WEL. AND SUPP.	90 hours
Content (Handbook 04)	**Content**
Electric Arc Welding Machines A.C./D.C. (750-217) Fundamentals of Metallic Arc Welding of Soft Steel (750-218) Preparation of Welding Work (750-226) Welding Material (750-228)	

OAW, FERROUS METALS AND OA SURF.	45 hours
Content (Handbook 04)	**Content**
Oxy-Acetylene Welding of Ferrous Metals (750-221) Oxy-Acetelyne Surfacing of Elements (750-223)	

OAW, ALLOY STEELS	45 hours
Content (Handbook 04)	**Content**
Oxy-Acetylene Welding of Steel Alloys (750-225)	

OAW STRUCT., CAST IRON, PIPES	45 hours
Content (Handbook 04)	**Content**
Oxy-Acetylene Welding of Structures, Cast Iron, Ferrous Pipes (750-231)	

MAKING OF PIPE FITTINGS	45 hours
Content (Handbook 04)	**Content**
Making of Pipe Fittings (750-240)	

OAW, NON-FERROUS METALS	30 hours
Content (Handbook 04)	**Content**
Oxy-Acetylene Welding of Non-Ferrous Metals (750-234)	

SMAW SURFACING	30 hours
Content (Handbook 04)	**Content**
Surfacing of Elements With Metallic Arc (750-238)	

SMAW, ALLOY STEELS, TH. TREATM.	45 hours
Content (Handbook 04)	**Content**
Metallic Arc Welding of Steel Alloys (750-236) Thermal Treatments I (750-227)	

SMAW, CAST IRON, M. ST. PIPES	75 hours
Content (Handbook 04)	**Content**
Welding of Cast Iron and Mild Steel Pipes With Metallic Arc (750-243)	

SMAW NON-FERROUS METALS	30 hours
Content (Handbook 04)	**Content**
Metallic Arc Welding of Non-Ferous Metal (750-248)	

AUTOMATIC OXY. CUTTING	30 hours
Content (Handbook 04)	**Content**
Automatic Oxy-Cutting (750-250)	

GTAW, SURFACING, ALLOY STEELS	90 hours
Content (Handbook 04)	**Content**
Surfacing of Elements with Tungsten Arc (750-252) Tungsten Arc Welding of Steel Alloys (750-254)	

ELEC. ARC CUT. AND GTAW Proc.	105 hours
Content (Handbook 04)	**Content**
Electric Arc Cutting 9750-256) Tungsten Arc Welding of Ferrous and Non-Ferrous Metals (750-258)	

AUTOMATIC WELDING PROCESS	15 hours
Content (Handbook 04)	**Content**
Welding with Automatic Machines (750-260)	

GMAW SURFACING, ALLOY STEELS	90 hours
Content (Handbook 04)	**Content**
Surfacing of Elements with Semi-Automatic Arc (750-261) Semi-Automatic Arc Welding of Steel Alloys (750-264)	

GMAW, THIN AND NON-FERR. MET.	90 hours
Content (Handbook 04)	**Content**
Semi-Automatic Arc Welding of Thin Ferrous Metals (750-267) Semi-Automatic Arc Welding of Non-Ferrous Metals (750-270)	

PROGRAM: PIPE FITTER

S.S.V.D.: 90 credits

COURSE LIST

CODE DU PROGRAMME: 1230

Premier semestre: 30 crédits		Heures	Crédits
308-012	Shop Industrial Safety	30	2
311-013	Tools Layout, hand and Power Tools	45	3
311-021	Metallurgy	15	1
311-033	Piping and Connections	45	3
311-043	Oxyacetylene Welding	45	3
311-051	Assembly Procedure	15	1
311-061	Fluids Pressure	15	1
311-071	Properties of Air and Water	15	1
311-081	Notions of Thermic Insulation	15	1
311-091	Elements of Thermology	15	1
311-102	Electricity and Controls	30	2
311-112	Shop Mathematics	30	2
311-126	Basic Technical Drawing	90	6
311-133	Plumbing Code (Sections I, II, III)	45	3

Deuxième semestre: 30 crédits		Heures	Crédits
311-142	Supports and Cables	30	2
311-156	Servers, Drains, Branches	90	6
311-168	Drainage, Waste and Vents	120	8
311-174	Water Distribution	60	4
311-184	Resid. Sanitary Plumbing Fixtures	60	4
311-162	Construction Safety Course	30	2
311-193	Drawing and Blueprint Reading I	45	3
311-201	Industrial Field Trip	15	1

Troisième semestre: 30 crédits		Heures	Crédits
311-218	Plumbing Fixtures, Drainage and Acc.	120	8
311-225	Water Heaters	75	5
311-232	Rain Water Piping and Accessories	30	2
311-243	Water Pumps and Accessories	45	3
311-252	Maintenance	30	2
311-261	Septic Tanks installations	15	1
311-272	Introduction to Heating	30	2
311-283	Drawing and Blueprint Reading II	45	3
311-294	Works Study Program	60	4

SECTEUR: **HYDROTHERMIE**
PROGRAMME: **MÉCANICIEN EN TUYAUTERIE**
PROGRAMME MENANT AU DIPLÔME D'ÉTUDES PROFESSIONNELLES (DEP)
TEMPS DE FORMATION: 1 350 heures
NOMBRE TOTAL DE CRÉDITS: 90 crédits

SÉCURITÉ EN ATELIER	30 heures
Content	**Content (doc. 16-4136-04-16-18)**
Sécurité en atelier	Sécurité en atelier (301-018)

OUTILLAGE	45 heures
Content	**Content (doc. 16-4136-04-16-18)**
Outillage	Instruments de mesure et de traçage (301-021) Outils manuels d'usage général (301-038) Outillage mécanique (301-048) Outils de coupe 9301-058)

MATÉRIAUX DE FAB. MÉTALLIQUE	15 heures
Content	**Content (doc. 16-4136-04-16-18)**
Matériaux de fab. métallique	Matériaux de fabrication métallique (302-078)

TUYAUTERIE ET RACCORDS	45 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Tuyauterie et raccords	Tuyauterie et raccords (302-161)

SOUDAGE DE BASE	45 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Soudage de base	Poste de soudage oxyacétylénique (301-085) Introduction au brasage (301-128) Machines de soudage à l'arc électrique C.C. et C.A. (301-131)

PROCÉDÉS D'ASSEMBLAGE	15 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Procédés d'assemblage	Procédés d'assemblage (302-148)

LES FLUIDES	15 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Les fluides	Techniques de circulation des fluides (302-198) Effets de la pression sur les fluides (302-218)

PROPRIÉTÉS DE L'EAU, DE L'AIR	15 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Propriétés de l'eau, de l'air	Propriétés de l'eau (302-178) Propriétés de l'air (302-188)

NOTIONS D'ISOLATION	15 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Notions d'isolation	Notions d'isolation thermique (302-228)

ÉLÉMENTS DE THERMOLOGIE	15heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Éléments de thermologie	Éléments de thermologie (302-238)

NOTIONS D'ÉLECT. ET CONTRÔLES	30 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Notions d'élect. et contrôles	Éléments de contrôle (302-241) Notions d'électricité (302-251)

MATHÉMATIQUES APPLIQUÉES	30 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Mathématiques appliquées	Mathématiques appliquées (302-261)

DESSIN DE BASE	75 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Dessin de base	Éléments de base du dessin (338-418) Projections orthogonales (338-428) Cotation appliquée à la mécanique I (338-438) Croquis (338-448) Coupes (338-458) Vues auxiliaires (338-468) Dessin d'ensemble mécanique I (338-478)

CODE (SECTIONS I, II, III)	45 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Code (Sections I, II, III)	Code de plomberie (311-018)

SUSPENSION ET MANUTENTION	30 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Suspension et manutention	Manutention (301-068) Suspension et ancrage (302-158) Suspension et manutention (311-029)

ÉGOÛTS, DRAINS, BRANCHEMENTS	90 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Égoûts, drains, branchements	Tuyauterie d'égout (311-031) Drains de bâtiment et branchements de drains (311-054)

COLONNES, RENVOIS, ÉVENTS ESS.	120 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Colonnes, renvois, évents ess.	Installation des colonnes (311-069) Branchements horizontaux des renvois d'appareils sanitaires (311-079) Systèmes d'évents (311-081) Essais d'étanchéité (311-118)

DISTRIBUTION D'EAU	60 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Distribution d'eau	Réseau de distribution d'eau froide (311-131) Réseau de distribution d'eau chaude (311-141)

APP. SANIT., SALLES DE BAIN e	60 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
App. sanit., salles de bain	Appareils sanitaires de salle de bain (311-159)

SÉCURITÉ CHANTIERS DE CONST.	30 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Sécurité chantiers de const.	Sécurité générale sur les chantiers de construction (278-510)

DESSIN ET LECTURE DE PLANS I	45 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Dessin et lecture de plans I	Dessin et lecture de plans appliqués à la plomberie (311-213)

VISITES INDUSTRIELLES	15 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Visites industrielles	Visites industrielles (302-278)

APP. SANIT., ACC. ET RENVOIS	120 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
App. sanit., acc. et renvois	Appareils de plomberie et accessoires (311-172)

CHAUFFE-EAU	75 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Chauffe-eau	Chauffe-eau (311-231)

TUYAUTERIE D'EAU PLUVIALE	30 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Tuyauterie d'eau pluviale	Tuyauterie des renvois des eaux pluviales (311-091)

POMPES ET ACCESSOIRES	45 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Pompes et accessoires	Pompes et accessoires (311-129)

ENTRETIEN	30 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Entretien	Entretien de robinetterie (311-168) Entretien des systèmes de plomberie (311-181)

INSTALLATION SEPTIQUE	15heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Installation septique	Installation septique (311-048)

INTRODUCTION AU CHAUFFAGE	30 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Introduction au chauffage	Introduction au chauffage (311-229)

DESSIN ET LECTURE DE PLANS II	45 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Dessin et lecture de plans II	Dessin et lecture de plans appliqués à la plomberie (311-213)

STAGE EN MILIEU DE TRAVAIL	60 heures
Contenu	**Contenu (doc. 16-4136-04-16-18)**
Stage en milieu de travail	Stage industriel (311-242)