

16-4139-50A

REORGANIZED PROGRAMS SUBDIVIDED INTO COURSES

SECTOR :MECHANIC
865-000

FOREWORD

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.

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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 available 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 (820-225)	Entretien du système de refroidissement (341-118) (4) Système de refroidissement du moteur (347-111) (5)	
(3)	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) Anatomy and Physiology (3) (640-207)	Distinguer les composantes de la structure normale de l'organisme humain (cellules - tissus - organes - systèmes) Distinguer les composantes: de la <u>fonction de relation</u> - systèmes locomoteur, nerveux et sensoriel; de la <u>fonction de génération</u> - 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 Mechanic sector consists of 1 program which has been reorganized

1766 General Machinist II (old codes 866-400/873-500) 1 350 hours, 90 credits

3.2 Specifications

None

PROGRAM: GENERAL MACHINIST II

S.S.V.D. 90 credits

COURSE LIST

PROGRAM CODE: 1766

First semester: 30 credits		Hours	Credits
873-011	Prospects of Development in Industrial Mechanics	15	1
873-033	Basic drawing and Sketching	45	3
873-022	Safety and Legislation	30	2
873-051	Applied Shop Mathematics I	15	1
873-043	Layout Sawing Filing	45	3
873-071	Metrology and Control	15	1
873-064	Drilling, Tapping, Grinding	60	4
873-101	Work Sheets	15	1
873-083	Matls. and Mechanical Const.	45	3
873-091	Study of Cutting and Machine Tools	15	1
873-111	Machine Maintenance	15	1
873-125	Turning I	75	5
873-133	Milling I	45	3
873-141	Surface Grinding I	15	1

Second semester: 30 credits		Hours	Credits
873-152	Assembly Drawing	30	2
873-162	Introduction to Welding	30	2
873-231	Applied Shop Mathematics II	15	1
873-242	Bench Work I	30	2
873-176	Turning II	90	6
873-183	Thread Cutting	45	3
873-195	Milling II	75	5
873-201	Surface Grinding II	15	1
873-262	Heat Treatment	30	2
873-223	Cutting Tools	45	3
873-212	Work Organization	30	2
873-251	Standardized Adjustment Classes	15	1

COURSE LIST

Third semester:	30 credits	Hours	Credits
873-286	Turning III	90	6
873-322	Cylindrical Grinding	30	2
873-312	Gear and Rack Cutting	30	2
873-272	Blueprint Reading	30	2
873-353	Computer Assisted Manufacturing	45	3
873-364	Industrial Training	60	4
873-295	Milling III	75	5
873-303	Angular and Circular Milling	45	3
873-331	Applied Shop Mathematics III	15	1
873-342	Bench Work II	30	2

SECTOR: MECHANIC

PROGRAM: GENERAL MACHINIST II

PROGRAM LEADING TO SECONDARY SCHOOL VOCATIONAL DIPLOMA: (SSVD)

DURATION OF PROGRAM: 1 350 heures

TOTAL NUMBER OF CREDITS: 90 credits

PROSPECTS OF DEVELOPMENT IN INDUSTRIAL MECHANICS 15 hours

Content	Main Focus of Evaluation
Perspectives professionnelles et notions d'histoire de la mécanique industrielle (366-019)	

BASIC DRAWING AND SKETCHING 45 hours

Content	Main Focus of Evaluation
Basic Elements (810-450) Orthogonal Projections (810-458) Applied Dimensioning (810-462) Sketching (810-466) Sections (810-470)	Interpret three-dimensional drawings Do three-dimensional sketches Applied dimensioning

SAFETY AND LEGISLATION 30 hours

Content	Content (Version améliorée)
Shop Practice and Safety (840-207)	Content Bill 17 Sécurité et législation industrielle (373-028) Prévention des accidents (366-198)

APPLIED SHOP MATHEMATICS I		15 hours
Content	Main Focus of Evaluation	
Applied Shop Mathematics I (840-570)	Fractions; algebra; decimals	

LAYOUT SAWING FILING		45 hours
Content	Main Focus of Evaluation	
Layout Work (840-203) Filing, Lapping and Polishing (840-205) Sawing and Band Sawing (840-206)	Angle measurements + - 1° Finding centers within .005	

METROLOGY AND CONTROL		15 hours
Content	Main Focus of Evaluation	
Quality Control (840-202)	Verniers and Dial indicators within .05mm Métrologie et contrôle (366-188)	

DRILLING, TAPPING, GRINDING		60 hours
Content	Main Focus of Evaluation	
Hand Tools - Bench tools (840-201) Drilling, Tapping and Threading (840-208) Grinding and Sharpening (840-218)	Ream within .05mm Perpendicularity + - 1° Proper abrasives for material being worked Bench work	

WORK SHEETS		15 hours
Content	Main Focus of Evaluation	
Work Sheets (840-214)	Accurate calculations Logical organization Gammes d'usinage (366-228)	
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MATLS. AND MECHANICAL CONST.		45 hours
Content	Main Focus of Evaluation	
Materials (840-204) Mechanical Construction (Ass. Principles) (840-210) Mechanical Construction (Ass. Components) (840-475)	Knowledge of metals Strength of materials Elements of machine assembly	
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STUDY OF CUTTING AND MACHINE TOOLS		15 hours
Content	Main Focus of Evaluation	
Cutting Tools (840-217)	Use of correct tools for job Feeds and speeds versus horsepower for optimal cut Étude de la coupe et des machines outils (366-238)	
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MACHINE MAINTENANCE		15 hours
Content	Content (Version améliorée)	
Machine Maintenance (840-229)	(366-028)	

TURNING I		75 hours
Content	Main Focus of Evaluation	
Turning Between Centers I (840-222) Mandrel Turning I (840-266) Taper Turning I (840-272)	Know parts and functions of the lathe Metrology for tapers Safety procedures	
MILLING I		45 hours
Content	Main Focus of Evaluation	
Milling I (840-227)	Know parts and functions of milling machine Safety procedures	
SURFACE GRINDING I		15 hours
Content	Main Focus of Evaluation	
Surface Grinding (840-226)	Know parts and function of the grinder Safety procedures Work to dimensions and proper surface finish	
ASSEMBLY DRAWING		30 hours
Content	Main Focus of Evaluation	
Assembly Drawing (810-478)	Visualize and describe single components	

INTRODUCTION OF WELDING		30 hours
Content	Main Focus of Evaluation	
Introduction to Welding	Fire safety in work area Safe operation and installation of storage of tanks	
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APPLIED SHOP MATHEMATICS II		15 hours
Content	Main Focus of Evaluation	
Applied Shop Mathematics I (840-570)	Trig functions for shop practices Algebraic operations	
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BENCH WORK I		30 hours
Content	Main Focus of Evaluation	
Bench Work (840-219)	Work from drawings Accurately choose appropriate tool and procedures Assembly and fitting of components	
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TURNING II		90 hours
Content	Main Focus of Evaluation	
Turning Between Centers II (840-554) Taper Turning II (840-560) Production Turning (840-269)	Respect drawing tolerance (373-149) Proper and secure holding methods Tool adjustments (373-199)	

THREAD CUTTING		45 hours
Content	Main Focus of Evaluation	
Thread cutting (840-273)	Tolerances for metric types Calculations for metric and u.n. threads	
MILLING II		75 hours
Content	Main Focus of Evaluation	
Vertical Milling (840-282) Horizontal Milling (840-285)	Select proper machine for type of cut (373-031) Safe and secure holding Methods for optimal speeds and feeds	
SURFACE GRINDING		15 hours
Content	Main Focus of Evaluation	
Surface Grinding Heat-Treated Parts (840-304)		
HEAT TREATMENT		30 hours
Content	Main Focus of Evaluation	
Heat Treatment (840-212)	Principles of heat treatment Diagram carbon/iron Hardness control	

CUTTING TOOLS		45 hours
Content	Main Focus of Evaluation	
Non-Metallic Cutting Tools (840-298)	Cutting forces versus horsepower	

WORK ORGANIZATION		30 hours
Content	Content (Version améliorée)	
Work Organization	Isostatisme I (373-278)	

STANDARDIZED ADJUSTMENT CLASSES		15 hours
Content	Main Focus of Evaluation	
(373-288)	Classes d'ajustements normalisés	

TURNING III		90 hours
Content	Content (Version améliorée)	
Steady Rest Turning (840-276) Faceplate Turning (840-312) Copy Turning (840-279) Mandrel Turning II (840-557)	Proper choice of steady rest, of follower rest (373-188) Accurate centering of work (373-219)	

CYLINDRICAL GRINDING		30 hours
Content	Main Focus of Evaluation	
Cylindrical Grinding (840-314)	Surface finish Dimension accuracy .0005	
GEAR AND RACK CUTTING		30 hours
Content	Main Focus of Evaluation	
Gear and Rack Cutting (840-295)	Proper alignment of 3 axes Centering cutter over work Gear calculations	
BLUEPRINT READING		30 hours
Content	Main Focus of Evaluation	
Blue print Reading (840-308)	Profile control symbols Limits and tolerances Lect. plans (373-248) Elements d'ens. (338-538) Cotation appliqué (328-568)	
COMPUTER ASSISTED MANUFACTURING		45 hours
Content	Main Focus of Evaluation	
Manufacturing Assisted by Computer I (373-319)	Calculating co-ordinates Applying codes Industrial applications Precision, speed, repetititon Process organization	

INDUSTRIAL TRAINING		60 hours
Content	Main Focus of Evaluation	
Work Study Session in Industry (373-018)	Job evaluation sheet sent for company to complete and return	
MILLING III		75 hours
Content	Main Focus of Evaluation	
Milling II (840-259) Milling Machine Review (840-310)		
ANGULAR AND CIRCULAR MILLING		45 hours
Content	Main Focus of Evaluation	
Circular Milling (840-292) Dividing Heads (840-290)		
APPLIED SHOP MATHEMATICS III		15 hours
Content	Main Focus of Evaluation	
Applied Shop (840-262) Mathematics II		
BENCH WORK II		30 hours
Content	Main Focus of Evaluation	
Bench Work (840-219)		