



2002 Curriculum for Certificate of  
Vocational Education  
(2003 REVISED EDITION)

---

Areas of Study :

Industrial Trades

Textile Industry

Bureau of Vocational Education Standards and Qualifications  
**Office of the Vocational Education Commission**  
**MINISTRY OF EDUCATION**

---



2002 Curriculum for Certificate of  
Vocational Education  
(2003 REVISED EDITION)

---

Areas of Study :

Industrial Trades

Textile Industry

Bureau of Vocational Education Standards and Qualifications  
**Office of the Vocational Education Commission**  
**MINISTRY OF EDUCATION**

---

## **Preface (2003 Revised Edition)**

The 2002 Curriculum for the Certificate of Vocational Education was launched by the Ministry of Education in 2002, and was revised by the Department of Vocational Education in 2003. Its main revision included program structures, time duration, and also the addition of vocational education standards of the programs and specializations, and course standards. This revision was done in order to be used as guidelines for better learning and teaching management, and for more concrete assessment of learners' learning achievements. It was also done in order to improve the curriculum and its management appropriate to the current practice and operations of vocational institutions.

The 2002 Curriculum for the Certificate of Vocational Education (2003 Revised Edition) has been successfully completed with great contributions and co-operations of government agencies, education institutes, teachers, and resource persons in private sector, especially those who have their names in the list. Their intelligence, knowledge, experience and time are very valuable for this important task concerning the education development of the country. The Department of Vocational Education is very grateful to all people who got involved with the task.

**Department of Vocational of Education  
2003**

## **Preface**

The 2002 Curriculum for the Certificate of Vocational Education has been developed in accordance with the 1999 National Education Act and technological advancement in the era of globalization. It aims to produce and develop skilled workers who have knowledge and vocational skills and experience in their areas. They are also together with morals, ethics, disciplines, personality, intelligence, and ability suitable for careers and according to the needs of labor market. These qualifications are in relation to the current economic and social contexts in community, local, and national levels. The curriculum will provide students opportunities to study according to their abilities, interests, potentialities and times. The curriculum also provides opportunity for public and private educational institutes, and also national and local communities, to take part in curriculum development and educational management.

The 2002 Curriculum for the Certificate of Vocational Education has been successfully completed with great contributions and co-operations of government agencies, education institutes, teachers, and resource persons in private sector, especially those who have their names in the list. Their intelligence, knowledge, experience and time are very valuable for this important task concerning the education development of the country. The Ministry of education is very grateful to those government and private agencies, and also the committee.

**Ministry of Education 2002**

# Table of Contents

	Page
Preface (2003 Revised Edition)	
Preface	
<b>1. 2002 Curriculum for the Certificate Vocational Education</b>	
Principles.....	1
Objectives .....	2
Curriculum Implementation.....	3
Coding System .....	6
<b>2. Area of Study: Industrial Trades</b>	
2.1 Mechanical Trade Program.....	7
2.2 Machine Tool and Maintenance Trade Program .....	17
2.3 Metallurgical Trade Program.....	31
2.4 Electrical and Electronics Trades Program.....	37
2.5 Building Construction Trades Program .....	49

# Mechanical Trade Program

2002 Curriculum for the Certificate of Vocational Education  
(2003 REVISED EDITION)  
Area of Study: Industrial Trades  
Program : Mechanical Trade

## **Objectives**

1. To understand the principle and to be able to apply Thai Social study, Science, Mathematics, Health Education and Physical Education to develop themselves and career.
2. To understand the principle and process of basic vocational courses and related work in developing mechanical field of study.
3. To understand the principle method and step in basic industry work, technical drawing select appropriate materials, fitting work and using hand tools .
4. To perform engine service, transmission system, suspension system and automotive electricity .
5. To provide vocational skill with the field of automotive or industrial machinery or ship mechanic or agricultural machinery.
6. To gain skill in applying mechanical work in industrial workplace or self-employment or future higher education.
7. To gain positives attitude in work, creative thinking, moral, ethics, honesty, discipline and social responsibility.

## Vocational Education Standards of the Program

### **Students should be able to:**

1. Communicate using Thai, English and other languages in daily life and carrier.
2. Develop oneself and society according to the principles of religions human rights culture and economics.
3. Develop oneself and career solve problems by using the scientific and process mathematics
4. Manage SMEs, Quality control and Productivity, environmental quality, vocational sanitation and safety in organization and community.
5. Use the computer package and information system to develop the career.
6. Interpret and technical drawing and select appropriate industrial material.
7. Assemble, test a basic electrical and electronic equipment circuits.
8. Perform in electrical welding, gas welding and metal fabrication.
9. Replace, test and assemble automobile parts.
10. Adjust, modify mechanical part and metal forming with hand tools.

### **Automotive Specialization**

11. Maintain gasoline engine, diesel engine following the manual.
12. Replace and assemble gasoline and diesel engine following the manual.
13. Maintain, clutch, gear and shaft following the manual.
14. Replace, assemble clutch, gear and shaft following the manual.
15. Maintain suspension system, wheel stroke control and break.
16. Replace and assemble clutch, gear and shaft following the manual.
17. Maintain battery, spark ignition, charging system, lighting system, signal and emergency light system following the manual.
18. Repair gasoline engine following the manual.
19. Repair diesel engine following the manual.
20. Repair small diesel engine and gasoline engine following the manual.
21. Maintain motorcycle following the manual.
22. Replace and assemble motorcycle following the manual.

### **Industrial Machinery Specialization**

18. Repair industrial machinery power following the manual.
19. Repair air compressor, pump and safety control devices.
20. Repair steam engine, windmill, turbine engine system and safety control devices.
21. Repair refrigeration and air-conditioning system.
22. install refrigeration and air-conditioning system.
23. Inspect spare part machinery using precision measurement.
24. Improve spare part machinery using machine tools.

### **Ship Mechanics Specialization**

18. Expand loft ship spare part blueprint and plan the ship engine installation.
19. Install ship engine and devices following the blueprint.
20. Repair ship engine following the manual.
21. Repair ship transmission devices following the manual.
22. Repair ship electrical system following the manual.



**Agricultural Machinery Specialization**

18. Maintain agriculture machine power.
19. Adjust and repair agriculture machine power.
20. Repair agriculture small engine.
21. Maintain tractor engine and accessories.
22. Adjust and repair tractor engine and accessories.
23. Maintain soil prepare following the manual.

**Auto body repair and repaint specialization**

18. Maintain auto spare part following the manual.
19. Replace and assemble auto spare part using the machine tools.
20. Repair auto spare part following the manual.
21. Replace and assemble auto spare part using special tools.
22. Maintain automobile following the manual.
23. repaint auto body following the manual.
24. Repair and maintain auto body paint.

## Program Structure

2002 Curriculum for the Certificate of Vocational Education  
(2003 REVISED EDITION)  
Area of Study: Industrial Trades  
Program : Mechanical trade

For the fulfillment of the program, graduates should have completed at least 104 credits from the 5 groups of courses below.

<b>1. General Courses (not less than)</b>		<b>28 credits</b>
<b>1.1 Basic General Courses</b>	<b>18 credits</b>	
<b>1.2 Vocational-based General Courses (not less than)</b>	<b>10 credits</b>	
<b>2. Vocational Courses (not less than)</b>		<b>66 credits</b>
<b>2.1 Basic Vocational Courses</b>	<b>25 credits</b>	
<b>2.2 Core Vocational Courses</b>	<b>12 credits</b>	
<b>2.3 Specialized Vocational Courses (not less than)</b>	<b>25 credits</b>	
<b>2.4 Project</b>	<b>4 credits</b>	
<b>3. Free Elective Courses (not less than)</b>		<b>10 credits</b>
<b>4. On-the-job Training (not less than 1 Semester)</b>		
<b>5. Extracurricular Activities 200 Hours</b>		
	<b>Total (not less than)</b>	<b>104 credits</b>

**1. General Courses (not less than) 28 credits**

<b>1.1 Basic General Courses</b>		<b>18 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2000-1101	Thai for the Workplace 1	2	(2)
2000-110X	Thai Language (Elective)	2	(2)
2000-1201	English for Communication 1	2	(2)
2000-1202	English for Communication 2	2	(2)
2000-1301	The Way of Thai Ethics	2	(2)
2000-130X	Social Studies (Elective)	2	(2)
2000-1401	Basic Science	2	(3)
2000-1501	Applied Mathematics 1	2	(2)
2000-160X	(Elective)	2	(*)

<b>1.2 Vocational-based General Courses</b>		<b>(not less than) 10 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2000-122X	English (Elective)	1	(2)
2000-122X	English (Elective)	1	(2)
2000-122X	English (Elective)	1	(2)
2000-122X	English (Elective)	1	(2)
2000-142X	Science (Elective)	2	(3)
2000-152X	Mathematics (Elective)	2	(2)
2000-152X	Mathematics (Elective)	2	(2)

**2. Vocational Courses (not less than) 66 credits**

<b>2.1 Basic Vocational Courses</b>		<b>25 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2001-0001	Computer at work	2	(3)
2001-0002	Basic Business Management	2	(3)
2001-0003	Quality and Productivity Management	2	(3)
2001-0004	Introduction to Environment Management	2	(3)
2001-0005	Vocational Hygiene and Safety	2	(3)
2100-1001	Basic Technical Drawing	2	(4)
2100-1002	Technical Materials	2	(2)
2100-1003	Basic Electricity and Electronic	2	(4)
2100-1004	Bench work	3	(6)
2100-1005	Basic Welding and Sheetmetal Practice	2	(4)
2100-1006	Basic Engine Practice	2	(4)
2100-1007	Basic Machine Tools Practice	2	(4)

<b>2.2 Core Vocational Courses</b>		<b>12 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2101-1001	Engine Practice	3	(6)
2101-1002	Automotive Power Transmission	3	(6)
2101-1003	Automotive Suspension	3	(6)
2101-1004	Automotive Electricity	3	(6)

### 2.3 Specialized Vocational Courses (not less than) 25 credits

Students must take at least 12 credits from the Specialized Vocational Courses. These can be taken from one field of specialization.

#### 2.3.1 Automotive Specialization

Code	Course Title	Cr	(Hr)
2101-2101	Gasoline Engine	3	(6)
2101-2102	Diesel Engine	3	(6)
2101-2103	Small Engine	3	(6)
2101-2104	Motor Cycle	3	(6)
2101-2105	Automotive Air Conditioning	3	(6)
2101-2106	Automotive Body	3	(6)
2101-2107	Automotive Painting	3	(6)
2101-2108	Automotive Maintenance	2	(4)
2101-2109	Automotive Driving	2	(3)
2101-2110	Motor Cycle Driving	2	(3)
2101-2111	Automotive Servicing Center	2	(2)
2101-2112	Automotive Drawing	2	(4)
2101-2113	Automotive Mathematics	2	(2)
2101-2114	Automotive Precision Measurement	2	(3)
2101-2115	Fuel and Lubricants	2	(2)
2101-2116	Electronic Fuel Injection System	2	(4)
2101-2117	Automotive Service	*	(*)
2101-4101	Automotive Practice 1	4	(*)
2101-4102	Automotive Practice 2	4	(*)
2101-4103	Automotive Practice 3	4	(*)
2101-4104	Automotive Practice 4	4	(*)
2101-4105	Automotive Practice 5	4	(*)
2101-4106	Automotive Practice 6	4	(*)

#### 2.3.2 Industrial Machinery Specialization

Code	Course Title	Cr	(Hr)
2101-2201	Industrial Power Generator	3	(6)
2101-2202	Industrial Machine	3	(6)
2101-2203	Refrigerator and Air - Conditioning	3	(6)
2101-2204	Industrial Machine Tools	3	(6)
2101-2205	Pump and Nozzle Testing	3	(6)
2101-2206	Industrial Measurement	3	(6)
2101-2207	Power Transmission	2	(4)
2101-2208	Computer-Aided Drafting	2	(4)
2101-2209	Mechanical Mechanics	3	(3)
2101-2210	Mechanical Mathematics	3	(3)
2101-2211	Steam Engine	2	(2)
2101-2212	Pump and Air Compressor	2	(2)
2101-2213	Fuel and Industrial Lubricants	2	(2)
2101-2214	Industrial Energy Conservation	2	(2)
2101-2215	Industrial Machine Servicing	*	(*)
2101-4201	Industrial Mechanical Practice 1	4	(*)
2101-4202	Industrial Mechanical Practice 2	4	(*)

2101-4203	Industrial Mechanical Practice 3	4	(*)
2101-4204	Industrial Mechanical Practice 4	4	(*)
2101-4205	Industrial Mechanical Practice 5	4	(*)
2101-4206	Industrial Mechanical Practice 6	4	(*)

### 2.3.3 Ship Mechanics Specialization(

Code	Course Title	Cr	(Hr)
2101-2301	Ship Engine Installation	3	(6)
2101-2302	Ship Engine Repairs	3	(6)
2101-2303	Ship Transmission	3	(6)
2101-2304	Ship Electricity	3	(6)
2101-2305	Ship Lofting	2	(3)
2101-2306	Piping	2	(3)
2101-2307	Pump	2	(4)
2101-2308	Navigation	2	(4)
2101-2309	Ship Air - Conditioning and Refrigerator	3	(6)
2101-2310	Fish Ship Mechanical	3	(6)
2101-2311	Ship Mechanical Drawing	2	(3)
2101-2312	Ship Organization Management	2	(2)
2101-2313	Ship Mechanical Servicing	*	(*)
2101-4301	Ship Mechanical Practice 1	4	(*)
2101-4302	Ship Mechanical Practice 2	4	(*)
2101-4303	Ship Mechanical Practice 3	4	(*)
2101-4304	Ship Mechanical Practice 4	4	(*)
2101-4305	Ship Mechanical Practice 5	4	(*)
2101-4306	Ship Mechanical Practice 6	4	(*)

### 2.3.4 Agricultural Machinery Specialization

Code	Course Title	Cr	(Hr)
2101-2401	Agriculture Power Generator	3	(6)
2101-2402	Small Engine for Agriculture	3	(6)
2101-2403	Basic Tractor	3	(6)
2101-2404	Soil Prepare Machinery	3	(6)
2101-2405	Plant Machinery	3	(6)
2101-2406	Animal Machinery	3	(6)
2101-2407	Pump and Water Transmission	3	(6)
2101-2408	Irrigation	3	(6)
2101-2409	tractor Diving	2	(4)
2101-2410	Agriculture Machinery Electronics	3	(6)
2101-2411	Building and Farm Construct	3	(6)
2101-2412	Farm Machinery	3	(6)
2101-2413	Agriculture Device Welding and Sheetmetal	3	(6)
2101-2414	Surveying for Agriculture	3	(6)
2101-2415	Agriculture Mechanical Drawing and Reading	2	(4)
2101-2416	Agriculture Mechanical Mathematic	3	(3)
2101-2417	Agriculture Mechanical Mechanics	3	(3)
2101-2418	Agriculture Mechanical Service	*	(*)
2101-4401	Agriculture Mechanical Practice 1	4	(*)
2101-4402	Agriculture Mechanical Practice 2	4	(*)

2101-4403	Agriculture Mechanical Practice 3	4	(*)
2101-4404	Agriculture Mechanical Practice 4	4	(*)
2101-4405	Agriculture Mechanical Practice 5	4	(*)
2101-4406	Agriculture Mechanical Practice 6	4	(*)

### 2.3.5 Auto body repair and repaint specialization

Code	Course Title	Cr	(Hr)
2101-2501	Automotive Body	3	(6)
2101-2502	Automotive Body Forming	3	(6)
2101-2503	Basic Automotive Paint	3	(6)
2101-2504	Automotive Paint	3	(6)
2101-2505	automotive Body Welding	3	(6)
2101-2506	automotive Body Repair	3	(6)
2101-2507	Automotive Body Parts Modify	3	(6)
2101-2508	Solid Paint	3	(6)
2101-2509	Metallic Paint	3	(6)
2101-2510	Special Paint	2	(4)
2101-2511	Plastic and Fiber glass	2	(4)
2101-2512	Automotive Body and Paint Maintenance	2	(4)
2101-2513	Automotive Body and Paint Business	2	(2)
2101-2514	Automotive Decorate	2	(4)
2101-2515	Automotive Body and Paint Service	*	(*)
2101-4501	Automotive Body and Paint Practice 1	4	(*)
2101-4502	Automotive Body and Paint Practice 2	4	(*)
2101-4503	Automotive Body and Paint Practice 3	4	(*)
2101-4504	Automotive Body and Paint Practice 4	4	(*)
2101-4505	Automotive Body and Paint Practice 5	4	(*)
2101-4506	Automotive Body and Paint Practice 6	4	(*)

(

For the Dual System (apprenticeships), the college and the employer together analyze the course objectives and course standards, to produce an appropriate work plan (40 hours is equivalent to 1 credit) and Design a method of evaluation.

### 2.4 Project

**4 credits**

Code	Course Title	Cr	(Hr)
2101-5001	Project	4	(*)

### 3. Free Elective Courses (not less than)

**10 credits**

Students can choose courses from any area of study, according to their aptitude and interests, from the list provided in the 2002 Curriculum for the Certificate of Vocational Education.

### 4. On-the-job Training (not less than 1 Semester)

For On-the-job Training, the college selects Vocational Courses which are undertaken at the workplace, for at least 1 semester.

**5. Extracurricular Activities (120 Hours)**

The college arranges extracurricular activities for 40 hours/semester, totaling not less than 120 hours for the entire program.

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2002-0001	Activities for Rover Scouts 1	-	(2)
2002-0002	Activities for Rover Scouts 2	-	(2)
2002-0003	Vocational Organization Activities 1	-	(2)
2002-0004	Vocational Organization Activities 2	-	(2)
2002-0005	Vocational Organization Activities 3	-	(2)
2002-0006	Vocational Organization Activities 4	-	(2)
2002-0007-12	Other Activities (by the workplace/alleges)	-	(2)

# Machine Tool and Maintenance Trade Program



2002 Curriculum for the Certificate of Vocational Education  
(2003 REVISED EDITION)  
Area of Study: Industrial Trades  
Program : Machine Tool and Maintenance Trade

### **Objectives**

1. To understand the principle and to be able to apply Thai Social study, Science, Mathematics, Health Education and Physical Education to develop themselves and career.
2. To understand the principle and process of basic vocational courses and related work in developing Machine tool and maintenance field of study.
3. To understand the principle method and step in basic industry work, technical drawing select appropriate materials, fitting work, using hand tools, basic electrical and electronics work
4. To understand the principle of mechanical design drawing and interpreting, operate general mechanical machines and automatic machines, make jig and fixtures, measure and inspect mechanical part

#### **Machine Tools Specialization**

5. To provide the ability to produce machine tools, jig and fixture, measure and inspect machine tools and cost estimate
6. To gain positive attitude in work, creative thinking, moral, ethics, honesty, discipline and social responsibility
7. To gain skill in applying mechanical work in industrial workplace or self-employment or future higher education.

#### **Machine Tools Maintenance Specialization**

5. To understand the principle of maintenance, improvement assemble, repair, installation inspection machinery pump and pipe work.
6. To provide the ability to maintain, improve, repair assemble, install and inspect machinery pump and pipe work.
7. To gain skill in applying machine tool maintenance work in industrial workplaces or in self-employment or future higher study.

#### **Mechanical Drafting Specialization**

5. to provide the ability to draw, sketch standard part machine tool part, machinery part, sheet metal drawing production drawing, pneumatics and hydraulics drawing electrical and electronics drawing, construction drawing CNC program drawing and drawing office management.
6. To provide the ability to produce plant machinery livestock machinery, agriculture machinery and aquatic animals machinery.
7. To gain skill in applying agriculture machinery work in industrial work place or itself –employment or future higher study.

**Mold-making Specialization**

5. To understand the principle of mold-making production.
6. To provide the ability to assemble, install, test and maintain mold-making.
7. To gain skill in applying mold-making work in industrial workplace or self-employment or further higher study.

**Die-making Specialization**

8. To understand the principle of die-making production.
9. To provide the ability to assemble, install, test and maintain mold-making.

## Vocational Education Standards of the Program

### Students should be able to:

1. Communicate using Thai, English and other languages in daily life and carrier.
2. Develop oneself and society according to the principles of religions human rights culture and economics.
3. Develop oneself and career solve problems by using the scientific and process mathematics
4. Manage SMEs, Quality control and Productivity, environmental quality, vocational sanitation and safety in organization and community.
5. Use the computer package and information system to develop the career.
6. Interpret and technical drawing and select appropriate industrial material.
7. Assemble, test a basic electrical and electronic equipment circuits.
8. Perform in electrical welding, gas welding and metal fabrication.
9. Replace, test and assemble automobile parts.
10. Adjust, modify mechanical part and metal forming with hand tools.
11. Interpret and draw standard symbol.
12. Control CNC machinery.
13. Measure dimension of work piece by using precision tool.

### Machine Tools specialization

14. Produce mechanical parts by using basic machine tools.
15. Improve material properties of mechanical parts.

### Machine Tool Maintenance Specialization

14. Maintain machinery, pump and piping system, refrigeration and air-conditioning system.
15. Inspect, repair, replace machinery spare part, pump and piping and refrigeration and air-conditioning system.
16. Install machinery, pump and piping system, refrigeration and air-conditioning system.

### Mechanical Drafting Specialization.

14. Interpret and draw machine tools in 2 and 3 dimension.
15. Interpret and draw machine tools detail.
16. Interpret and draw electrical, electronics mechanical work drawing
17. Interpret and draw residence construction drawing.
18. Perform budget for drawing.

### Agriculture Machine Tool Parts Specialization

14. Develop farming system.
15. Produce plant machinery parts.
16. Produce livestock machinery parts.
17. Produce poultry machinery parts.
18. Produce aquatic animal machine part.

**Mold-making Specialization**

14. Control mold-making machinery.
15. Measure, inspect mold making using precision tool.

**Die-making Specialization**

14. Control mold-making machinery.
15. Measure, inspect mold making using precision tool.

## Program Structure

2002 Curriculum for the Certificate of Vocational Education  
(2003 REVISED EDITION)  
Area of Study: Industrial Trades  
Program : Machine Tool and Maintenance Trade

For the fulfillment of the program, graduates should have completed at least 104 credits from the 5 groups of courses below.

### Machine Tools specialization

<b>1. General Courses (not less than)</b>		<b>28</b>	<b>credits</b>
<b>1.1 Basic General Courses</b>		<b>18</b>	<b>credits</b>
<b>1.2 Vocational-based General Courses (not less than)</b>		<b>10</b>	<b>credits</b>
<b>2. Vocational Courses (not less than)</b>		<b>66</b>	<b>credits</b>
<b>2.1 Basic Vocational Courses</b>		<b>25</b>	<b>credits</b>
<b>2.2 Core Vocational Courses</b>		<b>18</b>	<b>credits</b>
<b>2.3 Specialized Vocational Courses (not less than)</b>		<b>19</b>	<b>credits</b>
<b>2.4 Project</b>		<b>4</b>	<b>credits</b>
<b>3. Free Elective Courses (not less than)</b>		<b>10</b>	<b>credits</b>
<b>4. On-the-job Training (not less than 1 Semester)</b>			
<b>5. Extracurricular Activities 200 Hours</b>			
	<b>Total (not less than)</b>	<b>104</b>	<b>credits</b>

**Machine Tool Maintenance Specialization**

1. General Courses (not less than)		<b>28</b>	<b>credits</b>
1.1 Basic General Courses	<b>18</b>	<b>credits</b>	
1.2 Vocational-based General Courses (not less than)	<b>10</b>	<b>credits</b>	
2. Vocational Courses (not less than)		<b>66</b>	<b>credits</b>
2.1 Basic Vocational Courses	<b>23</b>	<b>credits</b>	
2.2 Core Vocational Courses	<b>25</b>	<b>credits</b>	
2.3 Specialized Vocational Courses (not less than)	<b>14</b>	<b>credits</b>	
2.4 Project	<b>4</b>	<b>credits</b>	
3. Free Elective Courses (not less than)		<b>10</b>	<b>credits</b>
4. On-the-job Training (not less than 1 Semester)			
5. Extracurricular Activities 200 Hours			
	<b>Total (not less than)</b>	<b>104</b>	<b>credits</b>

**Mechanical Drafting Specialization.**

1. General Courses (not less than)		<b>28</b>	<b>credits</b>
1.1 Basic General Courses	<b>18</b>	<b>credits</b>	
1.2 Vocational-based General Courses (not less than)	<b>10</b>	<b>credits</b>	
2. Vocational Courses (not less than)		<b>66</b>	<b>credits</b>
2.1 Basic Vocational Courses	<b>25</b>	<b>credits</b>	
2.2 Core Vocational Courses	<b>25</b>	<b>credits</b>	
2.3 Specialized Vocational Courses (not less than)	<b>12</b>	<b>credits</b>	
2.4 Project	<b>4</b>	<b>credits</b>	
3. Free Elective Courses (not less than)		<b>10</b>	<b>credits</b>
4. On-the-job Training (not less than 1 Semester)			
5. Extracurricular Activities 200 Hours			
	<b>Total (not less than)</b>	<b>104</b>	<b>credits</b>

**Agriculture Machine Tool Parts Specialization**

1. General Courses (not less than)		<b>28</b>	<b>credits</b>
1.1 Basic General Courses	<b>18</b>	<b>credits</b>	
1.2 Vocational-based General Courses (not less than)	<b>10</b>	<b>credits</b>	
2. Vocational Courses (not less than)		<b>66</b>	<b>credits</b>
2.1 Basic Vocational Courses	<b>25</b>	<b>credits</b>	
2.2 Core Vocational Courses	<b>24</b>	<b>credits</b>	
2.3 Specialized Vocational Courses (not less than)	<b>13</b>	<b>credits</b>	
2.4 Project	<b>4</b>	<b>credits</b>	
3. Free Elective Courses (not less than)		<b>10</b>	<b>credits</b>
4. On-the-job Training (not less than 1 Semester)			
5. Extracurricular Activities 200 Hours			
	<b>Total (not less than)</b>	<b>104</b>	<b>credits</b>

**Mold-making Specialization**

1. General Courses (not less than)		<b>28</b>	<b>credits</b>
1.1 Basic General Courses	<b>18</b>	<b>credits</b>	
1.2 Vocational-based General Courses (not less than)	<b>10</b>	<b>credits</b>	
2. Vocational Courses (not less than)		<b>66</b>	<b>credits</b>
2.1 Basic Vocational Courses	<b>25</b>	<b>credits</b>	
2.2 Core Vocational Courses	<b>18</b>	<b>credits</b>	
2.3 Specialized Vocational Courses (not less than)	<b>19</b>	<b>credits</b>	
2.4 Project	<b>4</b>	<b>credits</b>	
3. Free Elective Courses (not less than)		<b>10</b>	<b>credits</b>
4. On-the-job Training (not less than 1 Semester)			
5. Extracurricular Activities 200 Hours			
	<b>Total (not less than)</b>	<b>104</b>	<b>credits</b>

**Die-making Specialization**

<b>1. General Courses (not less than)</b>		<b>28 credits</b>
<b>1.1 Basic General Courses</b>	<b>18 credits</b>	
<b>1.2 Vocational-based General Courses (not less than)</b>	<b>10 credits</b>	
<b>2. Vocational Courses (not less than)</b>		<b>66 credits</b>
<b>2.1 Basic Vocational Courses</b>	<b>25 credits</b>	
<b>2.2 Core Vocational Courses</b>	<b>21 credits</b>	
<b>2.3 Specialized Vocational Courses (not less than)</b>	<b>16 credits</b>	
<b>2.4 Project</b>	<b>4 credits</b>	
<b>3. Free Elective Courses (not less than)</b>		<b>10 credits</b>
<b>4. On-the-job Training (not less than 1 Semester)</b>		
<b>5. Extracurricular Activities 200 Hours</b>		
	<b>Total (not less than)</b>	<b>104 credits</b>



**1. General Courses (not less than) 28 credits**

<b>1.1 Basic General Courses</b>		<b>18 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2000-1101	Thai for the Workplace 1	2	(2)
2000-110X	Thai Language (Elective)	2	(2)
2000-1201	English for Communication 1	2	(2)
2000-1202	English for Communication 2	2	(2)
2000-1301	The Way of Thai Ethics	2	(2)
2000-130X	Social Studies (Elective)	2	(2)
2000-1401	Basic Science	2	(3)
2000-1501	Applied Mathematics 1	2	(2)
2000-160X	(Elective)	2	(*)

<b>1.2 Vocational-based General Courses</b>		<b>(not less than) 10 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2000-122X	English (Elective)	1	(2)
2000-122X	English (Elective)	1	(2)
2000-122X	English (Elective)	1	(2)
2000-122X	English (Elective)	1	(2)
2000-142X	Science (Elective)	2	(3)
2000-152X	Mathematics (Elective)	2	(2)
2000-152X	Mathematics (Elective)	2	(2)

**2. Vocational Courses (not less than) 66 credits**

<b>2.1 Basic Vocational Courses</b>		<b>15 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2001-0001	Computer at work	2	(3)
2001-0002	Basic Business Management	2	(3)
2001-0003	Quality and Productivity Management	2	(3)
2001-0004	Introduction to Environment Management	2	(3)
2001-0005	Vocational Hygiene and Safety	2	(3)
2100-1001	Basic Technical Drawing	2	(4)
2100-1002	Technical Materials	2	(2)
2100-1003	Basic Electricity and Electronic	2	(4)
2100-1004	Bench work	3	(6)
2100-1005	Basic Welding and Sheetmetal Practice	2	(4)
2100-1006	Basic Engine Practice	2	(4)
2100-1007	Basic Machine Tools Practice	2	(4)

## 2.2 Core Vocational Courses and 2.3 Specialized Vocational Courses

Students must take one field of specialization.(ให้เลือกเรียนสาขางานใดสาขางานหนึ่ง)

### 1. Machine Tools specialization

2.2.1 Core Vocational Courses		18 credits	
Code	Course Title	Cr	(Hr)
2102-2101	Mechanical Drawing	2	(4)
2102-2102	Computer - Drawing	2	(4)
2102-2103	Precision Measurements	2	(3)
2102-2104	Mechanical Elements	2	(2)
2102-2105	Mechanical Mathematics	2	(2)
2102-2106	Machine Tools 1	6	(12)
2102-2107	Basic CNC	2	(3)

2.3.1 Specialized Vocational Courses (not less than)		19 credits	
Code	Course Title	Cr	(Hr)
2102-2108	Machine Tools 2	6	(12)
2102-2109	Machine Tools 3	6	(12)
2102-2110	CNC Machine Tools	6	(12)
2102-2111	Heat Treatment	3	(6)
2102-2112	Production Process	2	(2)
2102-2113	Jig and fixture production	3	(6)
2102-2114	Mechanical Mechanics	2	(2)
2102-2115	Machinery Maintenance	3	(6)
2102-2116	Cutting tool	3	(6)
2102-2117	Metal Foundry	3	(6)
2102-2118	Metal Plate	3	(6)
2102-2119	Fitting Work	3	(6)
2102-2120	Estimation	2	(2)
2102-2121	Machinery Power Transmission	3	(6)
2102-4101	Machine Tools Practice 1	3	(*)
2102-4102	Machine Tools Practice 2	3	(*)
2102-4103	Machine Tools Practice 3	3	(*)
2102-4104	Machine Tools Practice 4	3	(*)
2102-4105	Machine Tools Practice 5	4	(*)
2102-4106	Machine Tools Practice 6	4	(*)

### 2. Machine Tool Maintenance Specialization

2.2.2 Core Vocational Courses		23 credits	
Code	Course Title	Cr	(Hr)
2100-1008	Basic Pneumatics and Hydraulics Practice	2	(4)
2102-2201	Refrigeration and Air- Condition	2	(4)
2102-2202	Machine Tools	6	(12)
2102-2203	Machinery Parts	2	(4)
2102-2204	Machinery Parts Drawing	2	(4)
2102-2205	Machinery Maintenance	3	(6)
2102-2206	Machinery Repair 1	3	(6)
2102-2207	Machinery Repair 2	3	(6)

**2.3.2 Specialized Vocational Courses (not less than) 14 credits**

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2102-2208	Electrical Machinery Maintenance	2	(4)
2102-2209	Electrical Drawing	2	(4)
2102-2210	Machinery Parts Fitting	2	(4)
2102-2211	Machinery Maintenance & Service	2	(4)
2102-2212	Measuring and Inspect	2	(3)
2102-2213	Industrial Pump and Piping System	2	(4)
2102-2214	Industrial Lubricant	2	(2)
2102-2215	Tool and Equipment for Maintenance Work	2	(2)
2102-2216	Machine Power Transmission System	3	(6)
2102-2217	Fixture in Welding	3	(6)
2102-2218	Mechanical Mathematics	2	(2)
2102-4201	Machine Maintenance Practice 1	2	(*)
2102-4202	Machine Maintenance Practice 2	2	(*)
2102-4203	Machine Maintenance Practice 3	2	(*)
2102-4204	Machine Maintenance Practice 4	2	(*)
2102-4205	Machine Maintenance Practice 5	3	(*)
2102-4206	Machine Maintenance Practice 6	3	(*)

**3. Mechanical Drafting Specialization.****2.2.3 Core Vocational Courses****25 credits**

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2100-1008	Basic Pneumatics and Hydraulics Practice	2	(4)
2102-2301	Sketch	2	(4)
2102-2302	Standard Parts Drawing	2	(4)
2102-2303	Machinery Parts Drawing	2	(4)
2102-2304	Machine Tools Parts Drawing	2	(4)
2102-2305	Sheetmetal Drawing	2	(4)
2102-2306	Production Drawing	2	(4)
2102-2307	Mechanical Mathematics	2	(2)
2102-2308	Pneumatics and Hydraulics Drawing	2	(4)
2102-2309	Basic CNC Programming	2	(3)
2102-2310	Electrical and Electronic Drawing	2	(4)
2102-2311	Computer Aided Drawing	3	(6)

**2.3.3 Specialized Vocational Courses (not less than) 12 credits**

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2102-2312	Structure Drawing	2	(4)
2102-2313	CAD Jig and Fixture Drawing	3	(6)
2102-2314	CAD Tool and Die Drawing	3	(6)
2102-2315	CAD Plastic Mold Drawing	3	(6)
2102-2316	CAD Piping System Drawing	3	(6)
2102-2317	CAD Mechanical	3	(6)
2102-2318	CAD Construction	3	(6)
2102-2319	CAD Plumbing and Sanitary Drawing	3	(6)
2102-2320	Wastewater Treatment System Drawing	2	(4)
2102-2321	Casting Drawing	2	(3)
2102-4301	Mechanical Drawing Practice 1	2	(*)

2102-4302	Mechanical Drawing Practice 2	2	(*)
2102-4303	Mechanical Drawing Practice 3	2	(*)
2102-4304	Mechanical Drawing Practice 4	2	(*)
2102-4305	Mechanical Drawing Practice 5	2	(*)
2102-4306	Mechanical Drawing Practice 6	2	(*)

#### 4. Agriculture Machine Tool Parts Specialization

##### 2.2.4 Core Vocational Courses

**24 credits**

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2100-1008	Basic Pneumatics and Hydraulics Practice	2	(4)
2102-2401	Principles of Plant Science	2	(3)
2102-2402	Principles of Animal Husbandry	2	(3)
2102-2403	Basic Fisheries	2	(2)
2102-2404	Introduction to Agro-Industry	2	(2)
2102-2405	Agriculture Mechanical Mathematic	3	(3)
2102-2406	Mechanical Drawing	2	(4)
2102-2407	Agriculture Mechanical Drawing	2	(4)
2102-2408	Plant Machinery	2	(4)
2102-2409	Mechanical Assembling for Plant Production	1	(3)
2102-2410	Plant Machinery production	3	(6)
2102-2411	Livestock Machinery	1	(3)

##### 2.3.4 Specialized Vocational Courses (not less than) 13 credits

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2102-2412	Mechanical Assembling for Livestock Production	2	(4)
2102-2413	Livestock Machinery production	3	(6)
2102-2414	Poultry Machinery	1	(3)
2102-2415	Mechanical Assembling for Poultry Production	2	(4)
2102-2416	Poultry Machinery production	3	(6)
2102-2417	Aquatic Animals Machinery	1	(3)
2102-2418	Mechanical Assembling for Aquatic Animals Production	2	(4)
2102-2419	Aquatic Animals Machinery production	3	(6)
2102-4401	Agricultural Machinery parts Practice 1	2	(*)
2102-4402	Agricultural Machinery parts Practice 2	2	(*)
2102-4403	Agricultural Machinery parts Practice 3	2	(*)
2102-4404	Agricultural Machinery parts Practice 4	2	(*)
2102-4405	Agricultural Machinery parts Practice 5	3	(*)
2102-4406	Agricultural Machinery parts Practice 6	3	(*)

#### 5. Mold-making Specialization

##### 2.2.5 Core Vocational Courses

**18 credits**

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2102-2101	Mechanical Drawing	2	(4)
2102-2102	Computer - Drawing	2	(4)
2102-2103	Precision Measurements	2	(3)
2102-2104	Mechanical Elements	2	(2)
2102-2105	Mechanical Mathematics	2	(2)
2102-2107	Basic CNC	2	(3)
2102-2501	Mold parts production	6	(12)

**2.3.5 Specialized Vocational Courses (not less than) 19 credits**

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2102-2502	Injection mold Production 1	3	(6)
2102-2503	Injection mold Production 2	3	(6)
2102-2504	Blowing mold production	3	(6)
2102-2505	Extrusion mold production	3	(6)
2102-2506	Mold maintenance and Repair	3	(6)
2102-2507	Plastic Forming Process	2	(2)
2102-2508	Plastic Technology	2	(2)
2102-2509	Mold Drawing	2	(4)
2102-2111	Heat Treatment	3	(6)
2102-2120	Estimation	2	(2)
2102-4501	Mold Practice 1	3	(*)
2102-4502	Mold Practice 2	3	(*)
2102-4503	Mold Practice 3	3	(*)
2102-4504	Mold Practice 4	3	(*)
2102-4505	Mold Practice 5	4	(*)
2102-4506	Mold Practice 6	4	(*)

**6. Die-making Specialization****2.2.6 Core Vocational Courses****21 credits**

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2102-2101	Mechanical Drawing	2	(4)
2102-2102	Computer - Drawing	2	(4)
2102-2103	Precision Measurements	2	(3)
2102-2104	Mechanical Elements	2	(2)
2102-2105	Mechanical Mathematics	2	(2)
2102-2107	Basic CNC	2	(3)
2102-2111	Heat Treatment	3	(6)
2102-2601	Die parts production	6	12

**2.3.6 Specialized Vocational Courses (not less than) 16 credits**

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2102-2602	Blanking Die Production 1	3	(6)
2102-2603	Blanking Die Production 2	3	(6)
2102-2604	Forming Die Production 1	3	(6)
2102-2605	Forming Die Production 2	3	(6)
2102-2606	Forming Die Production 3	3	(6)
2102-2607	Metal Die Drawing	2	(4)
2102-4601	Die Practice 1	2	(*)
2102-4602	Die Practice 2	2	(*)
2102-4603	Die Practice 3	3	(*)
2102-4604	Die Practice 4	3	(*)
2102-4605	Die Practice 5	3	(*)
2102-4606	Die Practice 6	3	(*)

For the Dual System (apprenticeships), the college and the employer together analyze the course objectives and course standards, to produce an appropriate work plan (40 hours is equivalent to 1 credit) and Design a method of evaluation.

<b>2.4 Project</b>		<b>4 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2102-5001	Project	4	(*)

**3. Free Elective Courses (not less than) 10 credits**

Students can choose courses from any area of study, according to their aptitude and interests, from the list provided in the 2002 Curriculum for the Certificate of Vocational Education.

**4. On-the-job Training (not less than 1 Semester)**

For On-the-job Training, the college selects Vocational Courses which are undertaken at the workplace, for at least 1 semester.

**5. Extracurricular Activities (120 Hours)**

The college arranges extracurricular activities for 40 hours/semester, totaling not less than 120 hours for the entire program.

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2002-0001	Activities for Rover Scouts 1	-	(2)
2002-0002	Activities for Rover Scouts 2	-	(2)
2002-0003	Vocational Organization Activities 1	-	(2)
2002-0004	Vocational Organization Activities 2	-	(2)
2002-0005	Vocational Organization Activities 3	-	(2)
2002-0006	Vocational Organization Activities 4	-	(2)
2002-0007-12	Other Activities (by the workplace/alleges)	-	(2)

# Metallurgical Trade Program

2002 Curriculum for the Certificate of Vocational Education  
(2003 REVISED EDITION)  
Area of Study: Industrial Trades  
Program : Metallurgical Trade

**Objectives**

1. To understand the principle and to be able to apply Thai Social study, Science, Mathematics, Health Education and Physical Education to develop themselves and career.
2. To understand the principle and process of basic vocational courses and related work in developing mechanical field of study.
3. To understand the principle method and step in basic industry work, technical drawing select appropriate materials, fitting work and using hand tools.
4. To provide the ability to employ in metal welding and sheet metal production.
5. To gain skill in metal welding and sheet metal production.
6. To gain positive attitude in work, creative thinking, moral, ethics, honesty, discipline and social responsibility.



## Vocational Education Standards of the Program

### **Students should be able to:**

1. Communicate using Thai, English and other languages in daily life and carrier.
2. Develop oneself and society according to the principles of religions human rights culture and economics.
3. Develop oneself and career solve problems by using the scientific and process mathematics
4. Manage SMEs, Quality control and Productivity, environmental quality, vocational sanitation and safety in organization and community.
5. Use the computer package and information system to develop the career.
6. Interpret and technical drawing and select appropriate industrial material.
7. Assemble, test a basic electrical and electronic equipment circuits.
8. Perform in electrical welding, gas welding, and metal fabrication.
9. Replace, test and assemble automobile parts.
10. Adjust, modify mechanical part and metal forming with hand tools.
11. Perform in gas welding and gas cutting metal.
12. Perform in brazing on sheet metal, piping, metal and metal alloys.
13. Perform in carbon arc welding on high carbon sheet metal and pipe.
14. Perform in Tig welding on aluminum.
15. Perform in mig and mag welding on high carbon steel.
16. Design drawing of sheet metal work.
17. Produce metal fabrication work.
18. Estimate the metal production work.
19. Inspect and test welding work following the manual.

## Program Structure

2002 Curriculum for the Certificate of Vocational Education  
(2003 REVISED EDITION)  
Area of Study: Industrial Trades  
Program : Metallurgical Trade

For the fulfillment of the program, graduates should have completed at least 104 credits from the 5 groups of courses below.

### Machine Tools specialization

<b>1. General Courses (not less than)</b>		<b>28</b>	<b>credits</b>
<b>1.1 Basic General Courses</b>		<b>18</b>	<b>credits</b>
<b>1.2 Vocational-based General Courses (not less than)</b>		<b>10</b>	<b>credits</b>
<b>2. Vocational Courses (not less than)</b>		<b>66</b>	<b>credits</b>
<b>2.1 Basic Vocational Courses</b>		<b>25</b>	<b>credits</b>
<b>2.2 Core Vocational Courses</b>		<b>15</b>	<b>credits</b>
<b>2.3 Specialized Vocational Courses (not less than)</b>		<b>22</b>	<b>credits</b>
<b>2.4 Project</b>		<b>4</b>	<b>credits</b>
<b>3. Free Elective Courses (not less than)</b>		<b>10</b>	<b>credits</b>
<b>4. On-the-job Training (not less than 1 Semester)</b>			
<b>5. Extracurricular Activities 200 Hours</b>			
<b>Total (not less than)</b>		<b>104</b>	<b>credits</b>

**1. General Courses (not less than) 28 credits**

<b>1.1 Basic General Courses</b>		<b>18 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2000-1101	Thai for the Workplace 1	2	(2)
2000-110X	Thai Language (Elective)	2	(2)
2000-1201	English for Communication 1	2	(2)
2000-1202	English for Communication 2	2	(2)
2000-1301	The Way of Thai Ethics	2	(2)
2000-130X	Social Studies (Elective)	2	(2)
2000-1401	Basic Science	2	(3)
2000-1501	Applied Mathematics 1	2	(2)
2000-160X	(Elective)	2	(*)

<b>1.2 Vocational-based General Courses</b>		<b>(not less than) 10 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2000-122X	English (Elective)	1	(2)
2000-122X	English (Elective)	1	(2)
2000-122X	English (Elective)	1	(2)
2000-122X	English (Elective)	1	(2)
2000-142X	Science (Elective)	2	(3)
2000-152X	Mathematics (Elective)	2	(2)
2000-152X	Mathematics (Elective)	2	(2)

**2. Vocational Courses (not less than) 66 credits**

<b>2.1 Basic Vocational Courses</b>		<b>25 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2001-0001	Computer at work	2	(3)
2001-0002	Basic Business Management	2	(3)
2001-0003	Quality and Productivity Management	2	(3)
2001-0004	Introduction to Environment Management	2	(3)
2001-0005	Vocational Hygiene and Safety	2	(3)
2100-1001	Basic Technical Drawing	2	(4)
2100-1002	Technical Materials	2	(2)
2100-1003	Basic Electricity and Electronic	2	(4)
2100-1004	Bench work	3	(6)
2100-1005	Basic Welding and Sheetmetal Practice	2	(4)
2100-1006	Basic Engine Practice	2	(4)
2100-1007	Basic Machine Tools Practice	2	(4)

<b>2.2 Core Vocational Courses</b>		<b>15 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2103-2101	Welding Drawing 1	2	(4)
2103-2102	Welding Drawing 2	2	(4)
2103-2103	Basic Metallurgy	2	(4)
2103-2104	Welding 1	6	(12)
2103-2105	Sheet Metal and Products 1	3	(6)

## 2.3 Specialized Vocational Courses (not less than) **22 credits**

### 2.3.1 Metal Welding Specialization

Code	Course Title	Cr	(Hr)
2103-2106	Sheet Metal and Products 2	3	(6)
2103-2107	Welding 2	6	(12)
2103-2108	Welding 3	3	(6)
2103-2109	Welding 4	3	(6)
2103-2110	Mechanical Mechanics	3	(3)
2103-2111	Piping	3	(6)
2103-2112	Welding Mathematics	2	(2)
2103-2113	Paint	2	(4)
2103-2114	Welding Materials	2	(3)
2103-2115	Metal Plate	2	(4)
2103-2116	Aluminum Products	2	(4)
2103-2117	Plastic	2	(3)
2103-2118	Product Design	1	(2)
2103-2119	Pipe Welding	2	(4)
2103-2120	Pipe in Building	2	(4)
2103-2121	Materials Testing	2	(4)
2103-2122	Duct System	2	(4)
2103-2123	Structure	2	(4)
2103-2124	Fixture in Welding	2	(4)
2103-2125	Production Technology	2	(3)
2103-4101	Welding Practice 1	3	(*)
2103-4102	Welding Practice 2	3	(*)
2103-4103	Welding Practice 3	4	(*)
2103-4104	Welding Practice 4	4	(*)
2103-4105	Welding Practice 5	4	(*)
2103-4106	Welding Practice 6	4	(*)

For the Dual System (apprenticeships), the college and the employer together analyze the course objectives and course standards, to produce an appropriate work plan (40 hours is equivalent to 1 credit) and Design a method of evaluation.

### 2.4 Project

**4 credits**

Code	Course Title	Cr	(Hr)
2103-5001	Project	4	(*)

## 3. Free Elective Courses (not less than)

**10 credits**

Students can choose courses from any area of study, according to their aptitude and interests, from the list provided in the 2002 Curriculum for the Certificate of Vocational Education.

## 4. On-the-job Training (not less than 1 Semester)

For On-the-job Training, the college selects Vocational Courses which are undertaken at the workplace, for at least 1 semester.

**5. Extracurricular Activities (120 Hours)**

The college arranges extracurricular activities for 40 hours/semester, totaling not less than 120 hours for the entire program.

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2002-0001	Activities for Rover Scouts 1	-	(2)
2002-0002	Activities for Rover Scouts 2	-	(2)
2002-0003	Vocational Organization Activities 1	-	(2)
2002-0004	Vocational Organization Activities 2	-	(2)
2002-0005	Vocational Organization Activities 3	-	(2)
2002-0006	Vocational Organization Activities 4	-	(2)
2002-0007-12	Other Activities (by the workplace/alleges)	-	(2)

# Electrical and Electronics Trades Program

2002 Curriculum for the Certificate of Vocational Education  
(2003 REVISED EDITION)  
Area of Study: Industrial Trades  
Program : Electrical and Electronics Trades

## **Objectives**

1. To understand the principle and to be able to apply Thai Social study, Science, Mathematics, Health Education and Physical Education to develop themselves and career.
2. To understand the principle and process of basic vocational courses and related work in developing Electrical and Electronics field of study.
3. To understand the principle method and step in basic industry work, technical drawing select appropriate materials, fitting work and using hand tools .
4. To gain positive attitude in work, creative thinking, moral, ethics, honesty, discipline and social responsibility.

### **Electrical Power Specialization**

5. To provide the ability to interpret electrical drawing, estimate material, electrical control, repair and maintain electrical equipment, assemble and test electrical and electronics circuits
6. To provide the ability to test a trouble shooting, solve problem, maintain electrical equipment, electrical machines control equipment, pneumatics and hydraulics and PLC equipment.
7. To provide the ability to install, maintain and repair refrigeration and air conditioning.
8. To gain skill in applying electrical work in industrial work places or in self-employment or future higher study.

### **Electronics Specialization**

5. To provide the ability to interpret electrical drawing, estimate material, produce electronics equipment, assemble and test electronics circuits.
6. To gain skill in testing, trouble shooting, repair, maintenance electronics equipment.
7. To gain skill in applying electrical work in industrial work places or in self-employment or future higher study.

### **Telecommunication Specialization**

5. To understand the principle and process of telecommunication system, radio telecommunication system, and telephones.
6. To gain skill in applying telecommunication work in industrial work places or in self-employment or future higher study.

**Mechatronics Specialization**

5. To provide the ability to interpret electrical and mechanical drawing, estimate material, install and control electrical and mechanical in industrial system, assemble fix, and test electrical and electronics circuits and mechanical system.
6. To provide the ability to test, trouble shooting, repair, maintain industrial equipment.
7. To gain skill in applying mechatronics work in industrial work places or in self-employment or future higher study.

**Computer Technique Specialization**

5. To provide the ability to interpret electrical drawing, estimate material, produce equipment, assemble and test personal computer.
6. To provide the ability to test, trouble shooting, repair, maintain computer system software hardware and electronic Instrument.
7. To gain skill in applying Computer Technique work in industrial work places or in self-employment or future higher study.



## Vocational Education Standards of the Program

### Students should be able to:

1. Communicate using Thai, English and other languages in daily life and carrier.
2. Develop oneself and society according to the principles of religions human rights culture and economics.
3. Develop oneself and career solve problems by using the scientific and process mathematics
4. Manage SMEs, Quality control and Productivity, environmental quality, vocational sanitation and safety in organization and community.
5. Use the computer package and information system to develop the career.
6. Interpret and technical drawing and select appropriate industrial material.
7. Assemble, test a basic electrical and electronic equipment circuits.
8. Perform in electrical welding gas welding , and metal fabrication.
9. Replace, test and assemble automobile parts.
10. Adjust, modify and metal forming with hand tools.

### Electrical Power Specialization

11. Measure and test electrical circuits
12. Test the characteristics of electronics devices.
13. Interpret and draw the electrical drawing.
14. Install interior electrical system.
15. Test characteristic of D.C. electrical machines.
16. Repair, maintain and test A.C. electrical machines.
17. Control electrical motor.
18. Install, repair , maintain refrigeration and air conditioning.
19. Control electrical equipment using electronics controller.
20. the exterior electrical system.

### Electronics Specialization

- 11 Interpret and draw audio, video and communication system.
- 12 Install and test electronics devices and circuits.
- 13 Repair and maintain audio, video and communication system.
- 14 Repair and maintain computer and peripheral.
- 15 Repair and maintain industrial electronics devices.

### Telecommunication Specialization

- 11 Interpret and draw telecommunication work.
- 12 Install and test electronics devices in audio, video and communication system.
- 13 Repair and maintain electronics device in telecommunication system.
- 14 Repair and maintain telephones system.
- 15 Repair and maintain communication receiver.

### Mechatronics Specialization

11. Design drawing for electrical machines and electronics.
12. Assemble electrical and electronics devices and mechanical equipment.
13. Assemble and test electrical and electronics circuit following the manual.
14. Test mechanical equipment and electronics devices.
15. Control mechanical and electrical equipment.
16. Repair mechanical, electrical, electronic equipment following the manual.

**Computer Technique Specialization**

11. Design drawing for audio Video and computer.
12. Assemble equipment.
13. Test devices and Circuit in audio Video and computer system.
14. Repair computer and peripheral following the manual.

## Program Structure

2002 Curriculum for the Certificate of Vocational Education  
(2003 REVISED EDITION)  
Area of Study: Industrial Trades  
Program : Electrical and Electronics Trade

For the fulfillment of the program, graduates should have completed at least 107 credits from the 5 groups of courses below.

### Electrical Power Specialization

<b>1. General Courses (not less than)</b>		<b>28</b>	<b>credits</b>
<b>1.1 Basic General Courses</b>	<b>18 credits</b>		
<b>1.2 Vocational-based General Courses (not less than)</b>	<b>10 credits</b>		
<b>2. Vocational Courses (not less than)</b>		<b>69</b>	<b>credits</b>
<b>2.1 Basic Vocational Courses</b>	<b>25 credits</b>		
<b>2.2 Core Vocational Courses</b>	<b>25 credits</b>		
<b>2.3 Specialized Vocational Courses (not less than)</b>	<b>15 credits</b>		
<b>2.4 Project</b>	<b>4 credits</b>		
<b>3. Free Elective Courses (not less than)</b>		<b>10</b>	<b>credits</b>
<b>4. On-the-job Training (not less than 1 Semester)</b>			
<b>5. Extracurricular Activities 200 Hours</b>			
	<b>Total (not less than)</b>	<b>107</b>	<b>credits</b>

### Electronics Specialization

<b>1. General Courses (not less than)</b>		<b>28</b>	<b>credits</b>
<b>1.1 Basic General Courses</b>	<b>18 credits</b>		
<b>1.2 Vocational-based General Courses (not less than)</b>	<b>10 credits</b>		
<b>2. Vocational Courses (not less than)</b>		<b>69</b>	<b>credits</b>
<b>2.1 Basic Vocational Courses</b>	<b>25 credits</b>		
<b>2.2 Core Vocational Courses</b>	<b>26 credits</b>		
<b>2.3 Specialized Vocational Courses (not less than)</b>	<b>14 credits</b>		
<b>2.4 Project</b>	<b>4 credits</b>		
<b>3. Free Elective Courses (not less than)</b>		<b>10</b>	<b>credits</b>
<b>4. On-the-job Training (not less than 1 Semester)</b>			
<b>5. Extracurricular Activities 200 Hours</b>			
	<b>Total (not less than)</b>	<b>107</b>	<b>credits</b>

**Telecommunication Specialization**

1. General Courses (not less than)		28 credits
1.1 Basic General Courses	18 credits	
1.2 Vocational-based General Courses (not less than)	10 credits	
2. Vocational Courses (not less than)		69 credits
2.1 Basic Vocational Courses	25 credits	
2.2 Core Vocational Courses	26 credits	
2.3 Specialized Vocational Courses (not less than)	14 credits	
2.4 Project	4 credits	
3. Free Elective Courses (not less than)		10 credits
4. On-the-job Training (not less than 1 Semester)		
5. Extracurricular Activities 200 Hours		
	<b>Total (not less than)</b>	<b>107 credits</b>

**Mechatronics Specialization**

1. General Courses (not less than)		28 credits
1.1 Basic General Courses	18 credits	
1.2 Vocational-based General Courses (not less than)	10 credits	
2. Vocational Courses (not less than)		69 credits
2.1 Basic Vocational Courses	25 credits	
2.2 Core Vocational Courses	26 credits	
2.3 Specialized Vocational Courses (not less than)	14 credits	
2.4 Project	4 credits	
3. Free Elective Courses (not less than)		10 credits
4. On-the-job Training (not less than 1 Semester)		
5. Extracurricular Activities 200 Hours		
	<b>Total (not less than)</b>	<b>107 credits</b>

**Computer Technique Specialization**

6. General Courses (not less than)		28 credits
1.1 Basic General Courses	18 credits	
1.2 Vocational-based General Courses (not less than)	10 credits	
7. Vocational Courses (not less than)		69 credits
2.1 Basic Vocational Courses	25 credits	
2.2 Core Vocational Courses	26 credits	
2.3 Specialized Vocational Courses (not less than)	14 credits	
2.4 Project	4 credits	
8. Free Elective Courses (not less than)		10 credits
9. On-the-job Training (not less than 1 Semester)		
10. Extracurricular Activities 200 Hours		
	<b>Total (not less than)</b>	<b>107 credits</b>

**1. General Courses (not less than) 28 credits**

<b>1.1 Basic General Courses</b>		<b>18 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2000-1101	Thai for the Workplace 1	2	(2)
2000-110X	Thai Language (Elective)	2	(2)
2000-1201	English for Communication 1	2	(2)
2000-1202	English for Communication 2	2	(2)
2000-1301	The Way of Thai Ethics	2	(2)
2000-130X	Social Studies (Elective)	2	(2)
2000-1401	Basic Science	2	(3)
2000-1501	Applied Mathematics 1	2	(2)
2000-160X	(Elective)	2	(*)

<b>1.2 Vocational-based General Courses</b>		<b>(not less than) 10 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2000-122X	English (Elective)	1	(2)
2000-122X	English (Elective)	1	(2)
2000-122X	English (Elective)	1	(2)
2000-122X	English (Elective)	1	(2)
2000-142X	Science (Elective)	2	(3)
2000-152X	Mathematics (Elective)	2	(2)
2000-152X	Mathematics (Elective)	2	(2)

**2. Vocational Courses (not less than) 69 credits**

<b>2.1 Basic Vocational Courses</b>		<b>25 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2001-0001	Computer at work	2	(3)
2001-0002	Basic Business Management	2	(3)
2001-0003	Quality and Productivity Management	2	(3)
2001-0004	Introduction to Environment Management	2	(3)
2001-0005	Vocational Hygiene and Safety	2	(3)
2100-1001	Basic Technical Drawing	2	(4)
2100-1002	Technical Materials	2	(2)
2100-1003	Basic Electricity and Electronic	2	(4)
2100-1004	Bench work	3	(6)
2100-1005	Basic Welding and Sheetmetal Practice	2	(4)
2100-1006	Basic Engine Practice	2	(4)
2100-1007	Basic Machine Tools Practice	2	(4)

## 2.2 Core Vocational Courses and 2.3 Specialized Vocational Courses

Students must take one field of specialization.(ให้เลือกรียนสาขางานใดสาขางานหนึ่ง)

### 1. Electrical Power Specialization

#### 2.2.1 Core Vocational Courses

25 credits

Code	Course Title	Cr	(Hr)
2100-1008	Basic Pneumatics and Hydraulics Practice	2	(4)
2104-2101	Electrical Drawing	2	(4)
2104-2102	Electric Circuits 1	3	(5)
2104-2103	Electric Circuits 2	3	(5)
2104-2104	Electrical Instruments	2	(4)
2104-2105	Interior and Industrial Electrical Installation	3	(6)
2104-2106	DC Electrical Machines	2	(2)
2104-2107	Transformer	2	(4)
2104-2108	AC Motor	3	(6)
2104-2109	Electrical Machinery Control	3	(6)

#### 2.3.1 Specialized Vocational Courses (not less than) 15 credits

Code	Course Title	Cr	(Hr)
2104-2110	Refrigeration and Air-Condition 1	3	(6)
2104-2111	Electrical Mathematics	3	(3)
2104-2112	Electronic Device and Circuit	2	(4)
2104-2113	AC Generator	2	(4)
2104-2114	Electrical Control and Programming	2	(4)
2104-2115	Industrial Electronics	3	(5)
2104-2116	Basic Digital	3	(5)
2104-2117	Refrigeration and Air-Condition 2	3	(6)
2104-2118	Estimation Electrical Installation	2	(2)
2104-2119	Power Plants	2	(2)
2104-2120	Electrical Rule and Standard	1	(1)
2104-2121	Exterior Electrical Installation	2	(4)
2104-2122	Electrical Appliance Repair and Service	2	(4)
2104-2123	Automotive Air-Condition	2	(4)
2104-2124	Basic Microprocessor	3	(5)
2104-2125	Basic Instrumentation and Control	3	(5)
2104-2126	Illumination	1	(1)
2104-2127	Energy Save Technique	1	(1)
2104-2128	Protection Equipments and Refrigeration Control	2	(4)
2104-4101	Electrical Practice 1	3	(*)
2104-4102	Electrical Practice 2	3	(*)
2104-4103	Electrical Practice 3	3	(*)
2104-4104	Electrical Practice 4	3	(*)
2104-4105	Electrical Practice 5	3	(*)
2104-4106	Electrical Practice 6	3	(*)

### 2. Electronics Specialization

#### 2.2.2 Core Vocational Courses

26 credits

Code	Course Title	Cr	(Hr)
2104-2201	Electric and Electronic Drawing	2	(4)
2104-2202	DC Circuits	2	(4)

2104-2203	AC Circuits	2	(4)
2104-2204	Electrical and Electronic Instruments	2	(4)
2104-2205	Electronic Devices	2	(4)
2104-2206	Electronic Circuits	2	(4)
2104-2207	Pulse and Digital Circuits	3	(6)
2104-2208	Audio Equipment	3	(6)
2104-2209	Radio Receiver	3	(6)
2104-2210	Radio Transmitter and Antenna	2	(4)
2104-2211	Television Receiver	3	(6)

### 2.3.2 Specialized Vocational Courses (not less than) 14 credits

Code	Course Title	Cr	(Hr)
2104-2212	Sound Systems	2	(4)
2104-2213	Video Systems	2	(4)
2104-2214	Industrial Electronics 1	3	(6)
2104-2215	Microprocessor	2	(4)
2104-2216	Computer Service	2	(4)
2104-2217	Telephone	2	(4)
2104-2218	Communication Radio	2	(4)
2104-2219	Electric and Electronic Appliance Service	2	(4)
2104-2220	Office Machine Service	2	(4)
2104-2221	Computer Network	2	(4)
2104-2222	Electronics Drawing with Computer	2	(4)
2104-2223	Printed Circuit and Silk Screen	2	(4)
2104-2224	Industrial Electronics 2	2	(4)
2104-2225	Basic Telecommunication	2	(2)
2104-2226	Electronic Projects	2	(4)
2104-2227	Integrated Circuit and Application	2	(4)
2104-2228	Electronic Mathematics	2	(2)
2104-2229	Advance Topics in Industrial Electronics	2	(3)
2104-2230	Advance Topics in Computer Electronics	2	(3)
2104-2231	Advance Topics in Telecommunication Electronics	2	(3)
2104-4201	Electronic Practice 1	3	(*)
2104-4202	Electronic Practice 2	3	(*)
2104-4203	Electronic Practice 3	3	(*)
2104-4204	Electronic Practice 4	3	(*)
2104-4205	Electronic Practice 5	3	(*)
2104-4206	Electronic Practice 6	3	(*)

## 3. Telecommunication Specialization

### 2.2.3 Core Vocational Courses

26 credits

Code	Course Title	Cr	(Hr)
2104-2301	Electric Circuits	3	(6)
2104-2302	Electrical and Electronic Instruments	2	(4)
2104-2303	Telecommunication Drawing	1	(3)
2104-2304	Electronic Device and Circuits	3	(6)
2104-2305	Pulse and Digital Circuits	3	(6)
2104-2306	Communication Receiver	3	(6)
2104-2307	Audio and Video System	3	(6)
2104-2308	Communication Transmitter	3	(6)

2104-2309	Antenna and Transmission Line	3	(6)
2104-2310	Telecommunication Instruments	2	(4)

### 2.3.3 Specialized Vocational Courses (not less than) 14 credits

Code	Course Title	Cr	(Hr)
2104-2311	Microprocessor and Microcontroller	3	(6)
2104-2312	Outside Plant Systems	3	(6)
2104-2313	Telephone System	3	(6)
2104-2314	Communication Systems	3	(6)
2104-2315	Principle of Fiber Optic Communication	2	(4)
2104-2316	Microcomputer and Application 1	2	(4)
2104-2317	Microcomputer and Application 2	2	(4)
2104-2318	Integrated Circuit and Application	3	(6)
2104-2319	Advance Topics in Telecommunication	3	(6)
2104-2320	Special Problems in Telecommunication	2	(4)
2104-2321	Principle of Satellite Communications	2	(4)
2104-2322	Telecommunication Service	1	(3)
2104-2323	Telecommunication Mathematics	2	(2)
2104-2324	Telecommunication Project Writing	1	(3)
2104-2325	Mobile Telephone Systems	2	(4)
2104-2326	Data Communication and network	3	(6)
2104-2327	Telecommunication Project	2	(3)
2104-4301	Telecommunication Practice 1	3	(*)
2104-4302	Telecommunication Practice 2	3	(*)
2104-4303	Telecommunication Practice 3	3	(*)
2104-4304	Telecommunication Practice 4	3	(*)
2104-4305	Telecommunication Practice 5	3	(*)
2104-4306	Telecommunication Practice 6	3	(*)

## 4. Mechatronics Specialization

### 2.2.4 Core Vocational Courses

26 credits

Code	Course Title	Cr	(Hr)
2100-1008	Basic Pneumatics and Hydraulics Practice	2	(4)
2104-2401	Mechatronics Drawing	2	(4)
2104-2402	Electric Circuits	3	(5)
2104-2403	Electronic Device and Circuit	2	(4)
2104-2404	Mechatronics Instruments	2	(4)
2104-2405	Digital and Microprocessor	3	(5)
2104-2406	Sensor and Transducer	3	(5)
2104-2407	Mechanical Mechanics	2	(2)
2104-2408	Electrical Machines	3	(5)
2104-2409	Mechanical Elements	2	(4)
2104-2410	Production Process	2	(4)

### 2.3.4 Specialized Vocational Courses (not less than) 14 credits

Code	Course Title	Cr	(Hr)
2104-2411	Automation Control	2	(4)
2104-2412	Programmable logic control	3	(5)
2104-2413	Industrial Control System	3	(5)
2104-2414	Drives Control System	3	(5)



2104-2415	Industrial Robotic	2	(4)
2104-2416	Industrial Instrumentation	2	(4)
2104-2417	Basic CNC Technology	3	(5)
2104-2418	FMS System	3	(5)
2104-2419	Computer Aided Design	2	(4)
2104-2420	Mechanical System Service	3	(6)
2104-2421	Computer Language Programming	2	(4)
2104-2422	Power Electronic	3	(5)
2104-2423	Interfaced System	2	(4)
2104-2424	Pneumatics and Hydraulics Control	2	(4)
2104-2425	Precision Measurements	2	(4)
2104-4401	Mechatronics Practice 1	3	(*)
2104-4402	Mechatronics Practice 2	3	(*)
2104-4403	Mechatronics Practice 3	3	(*)
2104-4404	Mechatronics Practice 4	3	(*)
2104-4405	Mechatronics Practice 5	3	(*)
2104-4406	Mechatronics Practice 6	3	(*)

## 5. Computer Technique Specialization

### 2.2.5 Core Vocational Courses

**26 credits**

Code	Course Title	Cr	(Hr)
2104-2501	Electronics Drawing with Computer	2	(4)
2104-2502	Electric Circuits	3	(6)
2104-2503	Electrical and Electronic Computer Instruments	2	(4)
2104-2504	Electronic Devices and Circuit	3	(6)
2104-2505	Pulse and Digital Circuits	3	(6)
2104-2506	Audio and Video System	3	(6)
2104-2507	Television Receiver and Monitor	3	(6)
2104-2508	Communication Systems	3	(6)
2104-2509	Computer and peripheral System	3	(6)
2104-2510	Computer Service	3	(6)
2104-2228	Electronic Mathematics	2	(2)

### 2.3.5 Specialized Vocational Courses (not less than) 14 credits

Code	Course Title	Cr	(Hr)
2104-2511	Basic Microprocessor	2	(4)
2104-2512	Computer Aided Design	2	(4)
2104-2513	Computer Network	2	(4)
2104-2514	Printer Service	2	(4)
2104-2515	Computer Power Supply Service	2	(4)
2104-2516	Operation System	2	(4)
2104-2517	Utility Program	2	(4)
2104-2518	Advanced Topics in Electronic Computer	2	(3)
2104-4501	Computer Service Practice 1	4	(*)
2104-4502	Computer Service Practice 2	4	(*)
2104-4503	Computer Service Practice 3	4	(*)
2104-4504	Computer Service Practice 4	4	(*)
2104-4505	Computer Service Practice 5	4	(*)
2104-4506	Computer Service Practice 6	4	(*)

For the Dual System (apprenticeships), the college and the employer together analyze the course objectives and course standards, to produce an appropriate work plan (40 hours is equivalent to 1 credit) and Design a method of evaluation.

### **2.4 Project**

**4 credits**

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2104–5001	Project	4	(*)

### **3. Free Elective Courses (not less than)**

**10 credits**

Students can choose courses from any area of study, according to their aptitude and interests, from the list provided in the 2002 Curriculum for the Certificate of Vocational Education.

### **4. On-the-job Training (not less than 1 Semester)**

For On-the-job Training, the college selects Vocational Courses which are undertaken at the workplace, for at least 1 semester.

### **5. Extracurricular Activities (120 Hours)**

The college arranges extracurricular activities for 40 hours/semester, totaling not less than 120 hours for the entire program.

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2002-0001	Activities for Rover Scouts 1	-	(2)
2002-0002	Activities for Rover Scouts 2	-	(2)
2002-0003	Vocational Organization Activities 1	-	(2)
2002-0004	Vocational Organization Activities 2	-	(2)
2002-0005	Vocational Organization Activities 3	-	(2)
2002-0006	Vocational Organization Activities 4	-	(2)
2002-0007-12	Other Activities (by the workplace/alleges)	-	(2)

# Building Construction Trades Program

2002 Curriculum for the Certificate of Vocational Education  
(2003 REVISED EDITION)  
Area of Study: Industrial Trades  
Program : Building Construction Trades

**Objectives**

1. To understand the principle and to be able to apply Thai Social study, Science, Mathematics, Health Education and Physical Education to develop themselves and career.
2. To understand the principle and process of basic vocational courses and related work in developing Building construction field of study.
3. To gain a good personality, skill in speaking and writing and skill in teamwork, social responsibility include moral and good hobbit .
4. To gain positive attitude in work, creative thinking, moral, ethics, honesty, discipline and social responsibility.

**Building Construction Specialization**

5. To understand the principle and process of basic building construction, woodworking masonry working, draw and interpret the building construction drawing, cost estimating and surveying construction.
6. To gain skill in developing work and applying technology to solve problem include in self-employment in basic building construction, wood working, masonry working draw and interpret the building construction drawing, cost estimating and surveying construction.

**Civil Specialization**

5. To understand the principle of basic engineering, sciences and technology and applicant in self –employment and future higher study.
6. To gain skill in developing work and applying technology to solve the problem in civil work, surveying work, wood machinery work, masonry work, rain fore concrete work, building construction work and estimating work.

**Architectural Specialization**

5. To understand the principle of design architectural drawing.
6. To gain skill in applying architectural work, develop and solve the architectural problem by using technology.

**Furniture and Interior Decoration Specialization**

5. To understand the principle of furniture making and Interior decoration and create model of furniture and Interior decoration, produce wood making production, draw and design furniture and decoration and estimate the cost of material and equipment.
6. To gain skill in applying the furniture and Interior decoration work develop process of working, draw, design and estimate the interior decoration work by using technology

**Surveying Specialization**

5. To provide the ability to plan and work in surveying work, leveling work, construction and surveying work, land surveying work.
6. To gain skill in surveying instrument maintenance

## Vocational Education Standards of the Program

### Students should be able to:

1. Communicate using Thai, English and other languages in daily life and carrier.
2. Develop oneself and society according to the principles of religions human rights culture and economics.
3. Develop oneself and career solve problems by using the scientific process, mathematics and technology.
4. Manage SMEs, Quality control and Productivity, environmental quality, vocational sanitation and safety in organization and community.
5. Use the computer package and information system to develop the career.

### Building Construction Specialization

6. Survey for building construction.
7. Draw and interpret the building construction drawing.
8. Use the hand tools and wood machinery for building construction.
9. Build, assemble wood pieces and produce wood working production.
10. Bond brick laying, coat masonry, bond tile laying and make reinforce concrete.
11. Estimate the cost of the building construction work.
12. Install the sanitation system and electrical system.

### Civil Specialization

6. Survey for building construction and civil.
7. Draw and interpret the building construction drawing and civil.
8. Use the hand tools and wood machinery for building construction and civil.
9. Build, assemble wood pieces and produce wood working production.
10. Bond brick laying, coat masonry, bond tile laying and make reinforce concrete
11. Estimate the cost of building construction work.

### Architectural Specialization

6. Draw building plan for building construction.
7. Draw building plan for building using CAD.
8. Design building construction work.
9. Draw landscape architectural drawing.
10. Make the building model.
11. Interpret and control the building work following the specification.
12. Inspect and control the building work following the specification.

### Furniture and Interior Decoration Specialization

6. Create art for furniture and interior decoration.
7. Draw and interpret the furniture and interior decoration drawing.
8. Use hand tools, equipment and machinery for the furniture production.
9. Produce and assemble furniture and interior decoration.
10. Make jig and fixtures for furniture work, install material and accessory for furniture and interior decoration.
11. Estimate the cost of the furniture and interior decoration equipment of house and office.
12. Control process of the furniture production and interior decoration.

**Surveying Specialization**

6. Survey for map by using the surveying instrument.
7. Conduct leveling by using simple method
8. Calculate the area and volume of plan surveying.
9. Make land division and identifies area.
10. Draw the map for civil construction.
11. Survey for building construction.

## Program Structure

### 2002 Curriculum for the Certificate of Vocational Education (2003 REVISED EDITION) Area of Study: Industrial Trades Program : Building Construction Trade

For the fulfillment of the program, graduates should have completed 5 groups of courses below.

#### **Building Construction Specialization** (at least 107 credits)

<b>1. General Courses (not less than)</b>		<b>26</b>	<b>credits</b>
<b>1.1 Basic General Courses</b>		<b>18</b>	<b>credits</b>
<b>1.2 Vocational-based General Courses (not less than)</b>		<b>8</b>	<b>credits</b>
<b>2. Vocational Courses (not less than)</b>		<b>71</b>	<b>credits</b>
<b>2.1 Basic Vocational Courses</b>		<b>10</b>	<b>credits</b>
<b>2.2 Core Vocational Courses</b>		<b>37</b>	<b>credits</b>
<b>2.3 Specialized Vocational Courses (not less than)</b>		<b>20</b>	<b>credits</b>
<b>2.4 Project</b>		<b>4</b>	<b>credits</b>
<b>3. Free Elective Courses (not less than)</b>		<b>10</b>	<b>credits</b>
<b>4. On-the-job Training (not less than 1 Semester)</b>			
<b>5. Extracurricular Activities 200 Hours</b>			
<b>Total (not less than)</b>		<b>107</b>	<b>credits</b>

#### **Civil Specialization** (at least 102 credits)

<b>1. General Courses (not less than)</b>		<b>26</b>	<b>credits</b>
<b>1.1 Basic General Courses</b>		<b>18</b>	<b>credits</b>
<b>1.2 Vocational-based General Courses (not less than)</b>		<b>8</b>	<b>credits</b>
<b>2. Vocational Courses (not less than)</b>		<b>66</b>	<b>credits</b>
<b>2.1 Basic Vocational Courses</b>		<b>10</b>	<b>credits</b>
<b>2.2 Core Vocational Courses</b>		<b>29</b>	<b>credits</b>
<b>2.3 Specialized Vocational Courses (not less than)</b>		<b>23</b>	<b>credits</b>
<b>2.4 Project</b>		<b>4</b>	<b>credits</b>
<b>3. Free Elective Courses (not less than)</b>		<b>10</b>	<b>credits</b>
<b>4. On-the-job Training (not less than 1 Semester)</b>			
<b>5. Extracurricular Activities 200 Hours</b>			
<b>Total (not less than)</b>		<b>102</b>	<b>credits</b>



**Architectural Specialization** (at least 104 credits)

1. General Courses (not less than)		26 credits
1.1 Basic General Courses	18 credits	
1.2 Vocational-based General Courses (not less than)	8 credits	
2. Vocational Courses (not less than)		68 credits
2.1 Basic Vocational Courses	10 credits	
2.2 Core Vocational Courses	36 credits	
2.3 Specialized Vocational Courses (not less than)	18 credits	
2.4 Project	4 credits	
3. Free Elective Courses (not less than)		10 credits
4. On-the-job Training (not less than 1 Semester)		
5. Extracurricular Activities 200 Hours		
	<b>Total (not less than)</b>	<b>104 credits</b>

**Furniture and Interior Decoration Specialization** (at least 109 credits)

1. General Courses (not less than)		26 credits
1.1 Basic General Courses	18 credits	
1.2 Vocational-based General Courses (not less than)	8 credits	
2. Vocational Courses (not less than)		73 credits
2.1 Basic Vocational Courses	10 credits	
2.2 Core Vocational Courses	37 credits	
2.3 Specialized Vocational Courses (not less than)	22 credits	
2.4 Project	4 credits	
3. Free Elective Courses (not less than)		10 credits
4. On-the-job Training (not less than 1 Semester)		
5. Extracurricular Activities 200 Hours		
	<b>Total (not less than)</b>	<b>109 credits</b>

**Surveying Specialization** (at least 102 credits)

1. General Courses (not less than)		26 credits
1.1 Basic General Courses	18 credits	
1.2 Vocational-based General Courses (not less than)	8 credits	
2. Vocational Courses (not less than)		66 credits
2.1 Basic Vocational Courses	10 credits	
2.2 Core Vocational Courses	29 credits	
2.3 Specialized Vocational Courses (not less than)	23 credits	
2.4 Project	4 credits	
3. Free Elective Courses (not less than)		10 credits
4. On-the-job Training (not less than 1 Semester)		
5. Extracurricular Activities 200 Hours		
	<b>Total (not less than)</b>	<b>102 credits</b>

**1. General Courses (not less than) 26 credits**

<b>1.1 Basic General Courses</b>		<b>18 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2000-1101	Thai for the Workplace 1	2	(2)
2000-110X	Thai Language (Elective)	2	(2)
2000-1201	English for Communication 1	2	(2)
2000-1202	English for Communication 2	2	(2)
2000-1301	The Way of Thai Ethics	2	(2)
2000-130X	Social Studies (Elective)	2	(2)
2000-1401	Basic Science	2	(3)
2000-1501	Applied Mathematics 1	2	(2)
2000-160X	(Elective)	2	(*)

<b>1.2 Vocational-based General Courses (not less than)8 credits</b>			
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2000-122X	English (Elective)	1	(2)
2000-122X	English (Elective)	1	(2)
2000-122X	English (Elective)	1	(2)
2000-122X	English (Elective)	1	(2)
2000-142X	Science (Elective)	2	(3)
2000-152X	Mathematics (Elective)	2	(2)

**2. Vocational Courses (not less than) 66 credits**

<b>2.1 Basic Vocational Courses</b>		<b>10 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2001-0001	Computer at work	2	(3)
2001-0002	Basic Business Management	2	(3)
2001-0003	Quality and Productivity Management	2	(3)
2001-0004	Introduction to Environment Management	2	(3)
2100-1302	Building Materials	2	(2)

**2.2 Core Vocational Courses and 2.3 Specialized Vocational Courses**

Students must take one field of specialization.(ให้เลือกเรียนสาขางานใดสาขางานหนึ่ง)

**1. Building Construction Specialization**

<b>2.2.1 Core Vocational Courses</b>		<b>37 credits</b>	
<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2001-0005	Vocational Hygiene and Safety	2	(3)
2100-1301	Basic Drawing	2	(4)
2100-1303	Woodworking Practice	3	(6)
2100-1304	Basic Electricity	2	(4)
2106-2101	Wood Work	3	(6)
2106-2102	Masonry Work 1	3	(6)
2106-2103	Building Construction Work 1	6	(12)
2106-2104	Construction Drawings 1	3	(6)
2106-2105	Construction Drawings 2	3	(6)
2106-2106	Surveying 1	2	(4)
2106-2107	Construction Cost Estimation 1	2	(2)

2106-2108	Construction LAW	2	(2)
2106-2109	Construction Technique 1	2	(2)
2106-2110	Structural Mechanics 1	2	(2)

### 2.3.1 Specialized Vocational Courses (not less than) 20 credits

Code	Course Title	Cr	(Hr)
2106-2111	Masonry Work 2	3	(6)
2106-2112	Building Construction Work 2	6	(12)
2106-2113	Construction Drawings 3	3	(6)
2106-2114	Construction Leveling	2	(4)
2106-2115	Construction Cost Estimation 2	2	(2)
2106-2116	Construction Inspection and Control	2	(2)
2106-2117	Construction Technique 2	2	(2)
2106-2118	Structural Mechanics 2	2	(2)
2106-2119	Construction Cost Estimation 3	2	(2)
2106-2120	Coating and Paint	2	(4)
2106-2121	Building Equipments	2	(2)
2106-2122	Surveying 2	3	(6)
2106-2123	Plumbing System and Sanitary	2	(4)
2106-2124	Building Construction Practice	6	(12)
2106-2125	Concrete Technology	2	(3)
2106-2126	Basic Welding	2	(4)
2106-2127	Aluminium Work in Building	3	(6)
2106-2128	Masonry Work 3	2	(4)
2106-2522	Construction Survey	2	(4)
2106-4101	Construction Workshop Practice 1	4	(*)
2106-4102	Construction Workshop Practice 2	4	(*)
2106-4103	Construction Workshop Practice 3	4	(*)
2106-4104	Construction Workshop Practice 4	4	(*)
2106-4105	Construction Workshop Practice 5	3	(*)
2106-4106	Construction Workshop Practice 6	3	(*)

## 2. Civil Specialization

### 2.2.2 Core Vocational Courses

29 credits

Code	Course Title	Cr	(Hr)
2100-1304	Basic Electricity	2	(4)
2106-2201	Concrete Technology	2	(2)
2106-2202	Fundamental Structure	3	(3)
2106-2203	Construction Techniques 1	2	(2)
2106-2204	Construction Techniques 2	2	(2)
2106-2205	Construction Cost Estimation 1	2	(2)
2106-2206	Construction Cost Estimation 2	2	(2)
2106-2207	Surveying	3	(6)
2106-2208	Route Surveying	3	(6)
2106-2209	Construction Drawing 1	2	(3)
2106-2210	Construction Drawing 2	2	(3)
2106-2211	Construction Drawing 3	2	(3)
2106-2212	Construction Drawing 4	2	(3)
2106-2213	Wood Work 1	3	(6)

**2.3.2 Specialized Vocational Courses (not less than) 23 credits**

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2106-2214	Wood Work 2	3	(6)
2106-2215	Wood Working Machine	3	(6)
2106-2216	Building Construction Work 1	3	(6)
2106-2217	Building Construction Work 2	3	(6)
2106-2218	Building Construction Work 3	3	(6)
2106-2219	Sanitary Work	3	(6)
2106-2220	Construction Law	2	(2)
2106-2221	Civil Construction Practice	3	(6)
2106-4201	Civil Construction Practice 1	4	(*)
2106-4202	Civil Construction Practice 2	4	(*)
2106-4203	Civil Construction Practice 3	4	(*)
2106-4204	Civil Construction Practice 4	4	(*)
2106-4205	Civil Construction Practice 5	4	(*)
2106-4206	Civil Construction Practice 6	4	(*)

**3. Architectural Specialization****2.2.3 Core Vocational Courses****36 credits**

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2001-0005	Vocational Hygiene and Safety	2	(3)
2100-1301	Basic Drawing	2	(4)
2106-2301	Basic Design	2	(4)
2106-2302	Architecture Design 1	3	(6)
2106-2303	Architecture Design 2	3	(6)
2106-2304	Architecture Design 3	3	(6)
2106-2305	Architecture Design 4	3	(6)
2106-2306	Construction Drawing 1	3	(6)
2106-2307	Construction Drawing 2	3	(6)
2106-2308	Construction Drawing 3	3	(6)
2106-2309	Construction Drawing with Computer 1	3	(6)
2106-2310	Draft 1	2	(4)
2106-2311	Art 1	2	(4)
2106-2312	Materials and Construction 1	2	(2)

**2.3.3 Specialized Vocational Courses (not less than) 18 credits**

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2106-2313	Construction Drawing with Computer 2	3	(6)
2106-2314	Materials and Construction 2	2	(2)
2106-2315	Structural Mechanics	2	(2)
2106-2316	Construction Law	1	(1)
2106-2317	Building Sanitary System	2	(2)
2106-2318	Art 2	2	(4)
2106-2319	Construction Estimating	2	(2)
2106-2320	Perspective and Presentation	3	(6)
2106-2321	Basic Computer Aided Design	3	(6)
2106-2322	Model	2	(4)
2106-2323	Construction Inspection and Control	2	(2)
2106-2324	Local Production and Design	2	(4)
2106-2325	Plant and Garden Decoration	1	(1)

2106-2326	Garden Maintenance	1	(1)
2106-2327	Draft 2	2	(4)
2106-2328	Gardening Practice	3	(6)
2106-2329	Construction Surveying	2	(4)
2106-2330	Thai Architecture	2	(4)
2106-2331	Interior Architectural Design 1	3	(6)
2106-2332	Interior Architectural Design 2	3	(6)
2106-2333	Landscape Architectural Design	3	(6)
2106-2334	Electrical Work in Building	2	(2)
2106-4301	Architecture Practice 1	3	(*)
2106-4302	Architecture Practice 2	3	(*)
2106-4303	Architecture Practice 3	3	(*)
2106-4304	Architecture Practice 4	3	(*)
2106-4305	Architecture Practice 5	3	(*)
2106-4306	Architecture Practice 6	3	(*)

#### 4. Furniture and Interior Decoration Specialization

##### 2.2.4 Core Vocational Courses

37 credits

Code	Course Title	Cr	(Hr)
2001-0005	Vocational Hygiene and Safety	2	(3)
2100-1301	Basic Drawing	2	(4)
2100-1303	Woodworking Practice	3	(6)
2100-1304	Basic Electricity	2	(4)
2106-2401	Basic Design	2	(3)
2106-2402	Art	2	(3)
2106-2403	Basic Design	2	(3)
2106-2404	Building Drawing	2	(4)
2106-2405	Furniture Drawing	2	(4)
2106-2406	Basic Furniture and Interior Design	2	(4)
2106-2407	Plan Reading	2	(2)
2106-2408	Woodworking Furniture	3	(6)
2106-2409	Basic Woodworking Machine	3	(6)
2106-2410	Paint and Finishing	2	(4)
2106-2411	Furniture and decorate estimate	2	(4)
2106-2412	Materials Equipment of Furniture and Interior	2	(2)
2106-2413	Computer Aided Furniture Design	2	(4)

##### 2.3.4 Specialized Vocational Courses (not less than) 22 credits

Students must take one Group

##### A. Furniture Production Group

Code	Course Title	Cr	(Hr)
2106-2414	Basic Jig and Fixtures	2	(4)
2106-2415	Industrial Furniture Drawing	3	(6)
2106-2416	Wood Working Machine	3	(6)
2106-2417	Furniture Production	3	(6)
2106-2418	Materials and Equipment of Furniture Industry	2	(2)
2106-2419	Knock Down Furniture	2	(4)
2106-2420	Wood Working Technique with Machine Tools	2	(4)
2106-2421	Furniture Technical	2	(2)
2106-2422	Wood Production	2	(4)

2106-2423	Furniture Finishing	2	(4)
2106-2424	Upholster	2	(4)
2106-2425	Drying - Curing and Protection Wood	2	(2)

### **B. Interior Decoration Group**

2106-2426	Decorate Materials	2	(2)
2106-2427	Basic Ergonomics Design Concepts	2	(2)
2106-2428	Furniture and Interior Drawing	3	(6)
2106-2429	Furniture and Interior Design	3	(6)
2106-2430	Decorate	3	(6)
2106-2431	Wall Cabinet and Wall Put Up a Partition	3	(6)
2106-2432	Interior Decorate Technical	2	(4)
2106-2433	Interior Decorate Components	2	(2)
2106-2434	Geometry and Sketching	2	(4)
2106-2435	Interior Architectural Design	2	(4)
2106-2436	Computer Aided Interior Design	2	(4)
2106-2437	Basic Thai Art	2	(2)
2106-2438	Door, Window Fixtures and Stair Decorate	2	(4)
2106-2439	Model	2	(2)
2106-2440	Inlay and Veneer Bending	2	(4)
2106-2441	Tradition Furniture	2	(4)
2106-2442	Plumbing System and Sanitary	2	(2)
2106-2443	Basic Welding	2	(4)
2106-2444	Aluminium Work	2	(4)
2106-2445	Fundamental of Structure	2	(2)
2106-4401	Furniture and Interior Decorative Practice 1	4	(*)
2106-4402	Furniture and Interior Decorative Practice 2	4	(*)
2106-4403	Furniture and Interior Decorative Practice 3	4	(*)
2106-4404	Furniture and Interior Decorative Practice 4	4	(*)
2106-4405	Furniture and Interior Decorative Practice 5	3	(*)
2106-4406	Furniture and Interior Decorative Practice 6	3	(*)

## **5. Surveying Specialization**

### **2.2.5 Core Vocational Courses**

**18 credits**

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2001-0005	Vocational Hygiene and Safety	2	(3)
2100-1301	Basic Drawing	2	(4)
2106-2501	Surveying 1	2	(4)
2106-2502	Surveying 2	2	(4)
2106-2503	Surveying 3	2	(4)
2106-2504	Surveying 4	2	(4)
2106-2505	Technical Mathematics	2	(2)
2106-2506	Coordinate Geometry	1	(1)
2106-2507	Spherical Trigonometry	2	(2)
2106-2508	Survey Computation 1	2	(4)
2106-2509	Survey Computation 2	2	(4)
2106-2510	Map Drawing	2	(4)
2106-2511	Photogrammetry	2	(4)
2106-2512	Leveling 1	2	(4)
2106-2513	Leveling 2	2	(4)

**2.3.5 Specialized Vocational Courses (not less than) 19 credits**

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2106-2514	Leveling 3	2	(4)
2106-2515	Leveling 4	2	(4)
2106-2516	Survey Computation 3	2	(4)
2106-2517	Survey Drawing 1	2	(4)
2106-2518	Survey Drawing 2	2	(4)
2106-2519	Practical Astronomy	2	(4)
2106-2520	Land Survey	2	(4)
2106-2521	Route Survey	2	(4)
2106-2522	Construction Survey	2	(4)
2106-2523	Electronic Instrument Assistant in Surveying	2	(4)
2106-2524	Fundamental of Construction Work	2	(4)
2106-2525	Survey Planning	2	(2)
2106-2526	Computer Aided Surveying	2	(4)
2106-2527	Land Law	1	(1)
2106-2528	Land Estimating	1	(1)
2106-2529	City Planning and Traffic	2	(4)
2106-2530	Irrigational Surveying	1	(1)
2106-2531	Mine Survey	1	(1)
2106-2532	Business Law	1	(1)
2106-2533	Highway	1	(1)
2106-4501	Surveying Practice 1	4	(*)
2106-4502	Surveying Practice 2	4	(*)
2106-4503	Surveying Practice 3	4	(*)
2106-4504	Surveying Practice 4	4	(*)
2106-4505	Surveying Practice 5	4	(*)
2106-4506	Surveying Practice 6	4	(*)

For the Dual System (apprenticeships), the college and the employer together analyze the course objectives and course standards, to produce an appropriate work plan (40 hours is equivalent to 1 credit) and Design a method of evaluation.

**2.4 Project****4 credits**

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2106-5001	Project	4	(*)

**3. Free Elective Courses (not less than)****10 credits**

Students can choose courses from any area of study, according to their aptitude and interests, from the list provided in the 2002 Curriculum for the Certificate of Vocational Education.

**4. On-the-job Training (not less than 1 Semester)**

For On-the-job Training, the college selects Vocational Courses which are undertaken at the workplace, for at least 1 semester.

### 5. Extracurricular Activities (120 Hours)

The college arranges extracurricular activities for 40 hours/semester, totaling not less than 120 hours for the entire program.

<b>Code</b>	<b>Course Title</b>	<b>Cr</b>	<b>(Hr)</b>
2002-0001	Activities for Rover Scouts 1	-	(2)
2002-0002	Activities for Rover Scouts 2	-	(2)
2002-0003	Vocational Organization Activities 1	-	(2)
2002-0004	Vocational Organization Activities 2	-	(2)
2002-0005	Vocational Organization Activities 3	-	(2)
2002-0006	Vocational Organization Activities 4	-	(2)
2002-0007-12	Other Activities (by the workplace/alleges)	-	(2)



**รวบรวมโดย**

**นายวิรัช คุณวุฒิวานิช (virach@bpcd.net)**

**สำนักมาตรฐานการอาชีวศึกษาและวิชาชีพ**

**สำนักงานคณะกรรมการการอาชีวศึกษา**

**1 มิถุนายน 2549**