



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

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Areas of Study :

Industrial Trades

Textile Industry

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

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## **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**

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

|  |                              |                    |
|--|------------------------------|--------------------|
| 1. General Courses (not less than)                   |                              | <b>28 credits</b>  |
| 1.1 Basic General Courses                            | 18 credits                   |                    |
| 1.2 Vocational-based General Courses (not less than) | 10 credits                   |                    |
| 2. Vocational Courses (not less than)                |                              | <b>69 credits</b>  |
| 2.1 Basic Vocational Courses                         | 25 credits                   |                    |
| 2.2 Core Vocational Courses                          | 25 credits                   |                    |
| 2.3 Specialized Vocational Courses (not less than)   | 15 credits                   |                    |
| 2.4 Project  | 4 credits                    |                    |
| 3. Free Elective Courses (not less than)             |                              | <b>10 credits</b>  |
| 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> |

#### Electronics Specialization

|  |                              |                    |
|--|------------------------------|--------------------|
| 1. General Courses (not less than)                   |                              | <b>28 credits</b>  |
| 1.1 Basic General Courses                            | 18 credits                   |                    |
| 1.2 Vocational-based General Courses (not less than) | 10 credits                   |                    |
| 2. Vocational Courses (not less than)                |                              | <b>69 credits</b>  |
| 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)             |                              | <b>10 credits</b>  |
| 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> |

**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.

|                    |                     |                  |             |
|--------------------|---------------------|------------------|-------------|
| <b>2.4 Project</b> |                     | <b>4 credits</b> |             |
| <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)</b> |                        | <b>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**

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**สำนักมาตรฐานการอาชีวศึกษาและวิชาชีพ**

**สำนักงานคณะกรรมการการอาชีวศึกษา**

**1 มิถุนายน 2549**