

Metal Work

2003 Curriculum for Diploma of Vocational Education
Area of Study: Industrial Trades
Program : Metal Works
Objectives

The program aims at providing students with knowledge, skills, abilities, attitudes and experience which will enable them to perform as competent technicians in the field of Metal works. The objectives of the program are:

1. To provide basic knowledge and skills about languages, society, humanities, mathematics and science; and also to apply these to self-development by seeking out further knowledge within the field of Metal Works.
2. To provide knowledge and skills about the basic principles and processes of technician tasks concerning industrial management and planning; and to provide the ability to follow new technological developments to improve their career.
3. To promote critical thinking, problem-solving skills and creative thinking; and to provide the ability to bring the technology into the development of Metal Works.
4. To promote good personality, responsibility to themselves, family and society, morals and ethics; and good manners in their career.
5. To provide the ability to work in industrial workplaces or in self-employment in the field of Metal Works.

Vocational Education Standards of the Program

Students should be able to:

1. Conduct technical communication in the workplace
2. Organize and program data-based systems in the workplace
3. Solve problems using mathematics, science, technology and relevant procedures
4. Manage, control and develop their quality of work
5. Demonstrate the attributes of technicians
6. Interpret and design drawing of metal works
7. Identify appropriate materials and techniques for welding process work
8. Test materials by metrology method

Industrial Welding Specialization

9. Interpret and construct drawings for production work
10. Select appropriate materials and techniques for metal Production work
11. Plan the process for metal production
12. Control the process for metal production
13. Perform in process control and testing the metal product
14. Solve problems in metal production

Welding Techniques Specialization

9. Interpret and construct drawing of the metal structure of buildings and bridges
10. Select appropriate materials and technique for the metal structure of buildings and bridges
11. Plan the process of making the metal structure of buildings and bridges
12. Control the process of making the metal structure of buildings and bridges
13. Inspect and test the process of making the metal structure of buildings and bridges
14. Solve problems the process of making the metal structure of buildings and bridges

Industrial piping Specialization

9. Interpret and design drawing for buildings and industrial piping systems
10. Select appropriate materials for buildings and industrial piping systems
11. Plan the process of making for buildings and industrial piping systems
12. Control the process of making for buildings and industrial piping systems
13. Solve problems during the installation of piping systems

Environmental Studies Specialization

9. Treat the water from natural resources by physical and chemical methods for consumption
10. Treat industrial waste water and maintain the waste water treatment system
11. Conduct air pollution control
12. Conduct noise pollution and vibration control
13. Manage hazardous material and waste
14. Conduct clean technology in organization

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study: Industrial Trades
Program : Metal Works

For the fulfillment of the program, graduates should have completed at least 90 credits from the 5 groups of courses below.

1. General Courses (not less than)		24 credits
1.1 Basic General Courses	13 credits	
1.2 Vocational-based General Courses (not less than)	11 credits	
2. Vocational Courses (not less than)		58 credits
2.1 Basic Vocational Courses	15 credits	
2.2 Core Vocational Courses	23 credits	
2.3 Specialized Vocational Courses (not less than)	16 credits	
2.4 Project	4 credits	
3. Free Elective Courses (not less than)		6 credits
4. On-the-job Training (not less than 1 Semester)		
5. Extracurricular Activities 120 Hours		
Total (not less than)		88 credits

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Metal Works Program or equivalent.

Bridging Courses

Students who have completed a Vocational Education Certificate in other fields or completed secondary school (M6 or Grade 12) must complete bridging courses as follows:

Code	Course Title	Cr	(Hr)
3100-0001	Basic Bench Work	3	(5)
3100-0002	Technical Drawing	2	(4)
3100-0003	Electrical and Electronics Work	2	(4)
3100-0004	Industrial Materials	2	(2)
3103-0001	Welding Drawing	2	(4)
3103-0002	Sheet Metal work	2	(4)
3103-0003	Gas Welding	2	(4)
3103-0004	Electrical Welding	2	(4)
3103-0005	Metal Production	2	(4)
	Total	19	(35)

1. General Courses (not less than) 24 credits

1.1 Basic General Courses		13 credits	
Code	Course Title	Cr	(Hr)
3000-110X	Thai Language (Elective)	3	(3)
3000-1201	Developing Skills for English Communication 1	2	(3)
3000-1202	Developing Skills for English Communication 2	2	(3)
3000-1301	Thai Life and Culture	1	(1)
3000-130X	Social Studies (Elective)	2	(2)
3000-1601	Library and Information Studies	1	(1)
3000-160X	Humanities (Elective)	2	(2)

1.2 Vocational-based General Courses		(not less than) 11 credits	
Code	Course Title	Cr	(Hr)
3000-122X	English (Elective)	1	(2)
3000-122X	English (Elective)	1	(2)
3000-142X	Science (Elective)	3	(4)
3000-1521	Mathematics 2	3	(3)
3000-1525	Calculus 1	3	(3)

2. Vocational Courses (not less than) 58 credits

2.1 Basic Vocational Courses 15 credits

Students must take the compulsory courses (3100-0101, 3100-0106, 3100-0107) and select one course from 3000-100X and one from 3000-020X to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3100-0101	Engineering Mechanics I	3	(3)
3100-0106	Pneumatics and Hydraulics	3	(4)
3100-0107	Strength of Materials	3	(3)
3000-100X	Quality Management (Elective)	3	(3)
3000-020X	Computer Technology (Elective)	3	(4)

Remarks : The code with X will be chosen from the appendix.

2.2 Core Vocational Courses 23 credits

Students must take 8 compulsory courses(3100-0151,3103-2001 to 2107)and select courses from the remainder to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3100-0151	Safety and Pollution Control	2	(3)
3103-2001	Welding Technology I	2	(4)
3103-2002	Welding and Works Drawing	2	(4)
3103-2003	Welding Qualification and Standard	2	(2)
3103-2004	Welding joint Design	2	(2)
3103-2005	Welding Consumables	2	(2)
3103-2006	Welding Plan	2	(2)
3103-2007	Materials and Metallurgy	3	(4)
3103-2008	Welding Metallurgy	3	(4)
3103-2009	Welding Inspection	3	(4)
3104-2010	Welding Materials Testing	3	(4)

2.3 Specialized Vocational Courses (not less than) 16 credits

Students must take at least 16 credits from the Specialized Vocational Courses. These can be taken from one field of specialization.

1. Industrial Welding Specialization

Code	Course Title	Cr	(Hr)
3100-0116	Materials Handling	2	(2)
3100-0117	Engineering Metrology	2	(3)
3100-0150	Quality Control	3	(3)
3103-2101	Industrial Welding Drawing	2	(4)
3103-2102	Metal Forming	2	(3)
3103-2103	Production Work	3	(5)
3103-2104	Surface finishing	2	(4)
3103-2105	Installation and Maintenance	2	(2)
3103-2106	Production Design	2	(4)
3103-2107	Casting technology	3	(5)
3103-2108	Special Invention in Industrial Welding	3	(*)
3103-2109	Advanced Industrial Welding	3	(*)
3103-2110	Fixture in Welding	2	(4)
3103-4101	Welding Industrial Technical Apprenticeship 1	4	(*)
3103-4102	Welding Industrial Technical Apprenticeship 2	4	(*)
3103-4103	Welding Industrial Technical Apprenticeship 3	4	(*)
3103-4104	Welding Industrial Technical Apprenticeship 4	4	(*)

2. Welding Techniques Specialization

Code	Course Title	Cr	(Hr)
3103-2201	Welding Technology 2	3	(6)
3103-2202	Welding Technology 3	3	(6)
3103-2203	Welding Calculation	2	(2)
3103-2204	Ultrasonic Inspection	3	(5)
3103-2205	X-Ray Inspection	3	(5)
3103-2206	Metallurgy 2	3	(3)
3103-2207	Metallurgy 3	3	(3)
3103-2208	Select Structure and Pressure Passel	2	(2)
3103-2209	Welding Electricity	2	(2)
3103-2210	Special Invention in Welding techniques	3	(*)
3103-2211	Advanced Welding	3	(*)
3103-2212	Advanced Maintenance	2	(4)
3103-2213	Advanced Welding Technology	3	(4)
3103-4201	Engineering Welding Technology Apprenticeship 1	4	(*)
3103-4202	Engineering Welding Technology Apprenticeship 2	4	(*)
3103-4203	Engineering Welding Technology Apprenticeship 3	4	(*)
3103-4204	Engineering Welding Technology Apprenticeship 4	4	(*)

3. Industrial Pipe Specialization

Code	Course Title	Cr	(Hr)
3103-2301	Piping Drawing	2	(4)
3103-2302	Pipe System in Building	2	(2)
3103-2303	Pipe System in Industrial	3	(3)
3103-2304	Industrial piping Installation	2	(4)
3103-2305	Ventilation System	2	(2)
3103-2306	Waste Water System	2	(2)
3103-2307	Special Invention Industrial piping	3	(*)
3103-2308	Advance Industrial piping	3	(*)
3100-0103	Fluid Mechanic	3	(3)
3103-4301	Piping Engineering Technical Apprenticeship 1	4	(*)
3103-4302	Piping Engineering Technical Apprenticeship 2	4	(*)
3103-4303	Piping Engineering Technical Apprenticeship 3	4	(*)
3103-4304	Piping Engineering Technical Apprenticeship 4	4	(*)

4. Environmental Studies Specialization

Code	Course Title	Cr	(Hr)
3100-0221	Fundamental of Environmental Chemistry	2	(3)
3100-0222	Fundamental of Environmental Microbiology	2	(3)
3100-0223	Basic Fluid Mechanics and Thermodynamics	3	(3)
3100-0224	Wastewater Treatment and Control Techniques	3	(5)
3100-0225	Air Pollution Control Techniques	2	(3)
3100-0226	Noise and Vibration Control Techniques	2	(3)
3100-0227	Hazardous Waste Management	2	(4)
3100-0228	Clean Technology for Technicians	2	(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.

2.4 Project

4 credits

Code	Course Title	Cr	(Hr)
3103-6001	Project	4	(*)

3. Free Elective Courses

(not less than) 6 credits

Students can choose courses from any area of study, according to their aptitude and interests, from the list provided in the 2003 Curriculum for the Diploma 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.