2003 Curriculum for Diploma of Vocational Education

Areas of Study :

- **Industrial Trades**
- **Textile Industry**
- **Information and Communication Technology**

Bureau of Vocational Education Standards and Qualifications

Office of the Vocational Education Commission

Ministry of Education

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Preface

The 2003 Curriculum for the Diploma of Vocational Education has been developed in accordance with technological advancement. It aims to produce and develop skilled workers with knowledge, vocational skills, morals, ethics, disciplines, attitude, personality, and intelligence. They are able to apply these qualifications into practice at work in relation to the requirements of the labor market, and current economic and social contexts at community, local, and national levels. The curriculum will provide students with opportunities to study according to their abilities, interests, potential and times. The curriculum also provides the opportunity for educational institutes, agencies and organizations to take part in curriculum development and educational management.

The 2003 Curriculum for the Diploma of Vocational Education has been successfully completed with contributions from and cooperation of government agencies, educational institutes, teachers, and resource persons in the private sector. Their intelligence, knowledge, experience and time have been of great value for this important task concerning the educational development of the country. The Office of Vocational Education Commission is very grateful to those government and private agencies, and also the curriculum development committee.

Office of the Vocational Education Commission
2003

Acknowledgement

This publication has been prepared by the Bureau of Vocational Education Standards and Qualification, Office of the Vocational Education Commission. It consists of principles, objectives, implementation, coding system, vocational standards, program structures of three areas of study: Industrial Trades; Textile Industry; and Information and Communication Technology, of 2003 Curriculum for Diploma of Vocational Education.

The Bureau of Vocational Standards and Qualification wishes to express the grateful appreciation to Dr. Praphon Chuthawithet, Mr. Greg Wadeson, and all translation committee members for their time and efforts to complete the tasks.

The Bureau hopes this document will be useful for vocational personnel and colleges, and also those who are going to study aboard.

Bureau of Vocational Education Standard and Qualification
Office of the Vocational Education commission
Ministry of Education
2005

Table of Contents

2003 Curriculum for the Diploma of Vocational Education

Principles

1. The curriculum aims to produce and develop skilled workers in particular occupational areas according to the requirements of the labor force, and according to economic, social, cultural, technological and environmental conditions, in order to be foremen or self-employed workers.

2. The curriculum emphasizes learners' occupational competencies with solid knowledge, practical experience and life skills.

3. The curriculum offers an opportunity for the business sector to cooperate in vocational education management, allows learners to transfer their learning experience from the workplace, and allows learners to accumulate credits for their own learning and experience.

Objectives

1. To provide knowledge and basic skills for livings; and the ability to search for additional knowledge and the opportunity for further study.

2. To provide vocational skills and competence according to the occupational standards.

3. To provide the ability to integrate knowledge and skills from different disciplines, and to apply them in a career according to technological changes.

4. To promote a positive attitude towards a career, self-confidence and pride in work, enjoyment of work, involvement in the organization, teamwork, and pride in one's vocational studies.

5. To promote intelligence, inquiry, learning habits, creative thinking, managing skills, and decision-making and problem-solving skills; to gain new ways for self-development; and to be able to continuously apply the knowledge at work.

6. To promote good a personality, morals, ethics, honesty, discipline and good health and mind.

7. To produce citizens with good social behavior at work and outside work; with responsibility towards their families, local organizations and the country; who devote oneself to society; who understand and see the value of Thai arts, culture, and local wisdom; and who have awareness of environmental issues and importance.

8. To promote awareness and involvement in developing the national economy, to promote thoughts about solving its problems, and to recognize the importance of the workforce in production and service areas.

9. To realize the value of and to maintain the institutions of nation, religion, and Royal Family; and to behave as a good citizen according to the democratic regime with the King as the head of the country.

Implementation

2003 Curriculum for the Diploma of Vocational Education

1. Learning-Teaching

1.1 According to the learning and teaching in this curriculum, learners are able to enroll in any modes of learning offered and to combine them. Learners can transfer credits between various modes and also from prior learning and experience to their formal courses.

1.2 Learning and teaching management emphasizes real practice by offering courses to practice or train in the workplace, for not less than 1 semester.

2. Time Duration

2.1 The academic year is divided into 2 regular semesters (20 weeks each) with class contact hours and credits as determined. An additional summer semester can be provided according to the requirements of each institute of about 5 weeks.

2.2 For in-class learning system, the institute is open for not less than 5 days a week. Each period is 60 minutes (1 hour).

2.3 In general, the total program is 2 years for the students who have a vocational certificate or equivalent in areas and programs as determined. For students who have upper secondary education certificates or equivalent, and also those who have vocational certificates in other areas and programs, the duration is 3 years.

3. Credits

Programs have a minimum of 85 credits and maximum of 100 credits. The relevant calculations are as follows:

3.1 Courses with theory: 1 credit is made up of 1 hour per week, with a total of not less than 20 hours per semester.

3.2 Courses with theory and practice: 1 credit is 2-3 hours per week, with a total of minimum 40-60 hours.

3.3 Courses to be practiced or trained at the workplace: A total of not less than 40 hours is equivalent to 1 credit.

3.4 On-the-job training in a Dual Vocational Training (DVT) program: Minimum 40 hours is equivalent to 1 credit.

3.5 Project: It follows the regulations stated in the curriculum.

4. Structure

The structure of the 2003 Curriculum for the Diploma of Vocational Education consists of 3 course groups, on-the-job training, and extracurricular activities as follows:

4.1 General courses

4.1.1 Basic general courses are courses applicable for everyday life.

4.1.2 Vocational-based general courses are specific to the workplace.

4.2 Vocational courses which are divided into:
- 4.2.1 Basic vocational courses are those basic related course groups necessary for particular areas of study.
- 4.2.2 Core vocational courses are those vocational courses for specific programs.
- 4.2.3 Specialized vocational courses are those vocational courses aiming to provide learners specific knowledge and specialized skills in careers according to their abilities and interests.
- 4.2.4 Project

4.3 Free elective courses
4.4 On-the-job training
4.5 Extracurricular activities

The number of credits and courses for each group of courses throughout the program follow the regulations stated in the structure of each area and program of study. In each course group, the institutes can organize courses as determined in the curriculum or appropriate to the local conditions. However, the institutes must provide course codes, and numbers of periods and credits according to the regulations stated in the curriculum.

5. Project

5.1 The institutes must organize time for learners to carry out their projects in the fourth semester for not less than 160 hours which is equivalent to 4 credits.
5.2 Evaluation and grading is done the same as other courses.

6. On-the-job Training

6.1 The institutes select vocational courses for students to practice or train in the workplaces for at least 1 semester.
6.2 Evaluation and grading is done the same as other courses.

7. Qualifications

The learner needs to have the following background knowledge and entrance qualifications.

7.1 Background knowledge

Successful completion of the certificate of vocational education or equivalent, or upper secondary education certificate or equivalent.

Learners with upper secondary education certificates or equivalent and those with vocational certificates in other areas and programs of study have to take bridging courses as determined in each area and program of study.

The study of bridging courses follows the regulations as stated in each program of study.

7.2 Entrance qualification

Already determined by the Ministry of Education according to the educational management section of the 2003 Diploma of Vocational Education Curriculum.

8. Evaluation

Already determined by the Ministry of Education according to the evaluation section of the 2003 Curriculum for the Diploma of Vocational Education.

9. Extracurricular Activities

The institutes must organize activities to promote morals, ethics, values, self-discipline, recreation, and work habits by using group activities; to contribute to the community; and to maintain valuable traditions and customs. The activities comprise planning, practice, evaluation, and work improvement for not less than 120 hours.

10. Graduation

Students must have:

10.1 Passed general, vocational, and free elective courses according to the standards stated in each area and program of study.

10.2 Achieved the total number of credits according to the curriculum structure of each area and program of study.

10.3 Obtained a grade point average of not less than 2.00.

10.4 Participated in the extracurricular activities and passed them as determined.

11. Adjustment of Curriculum

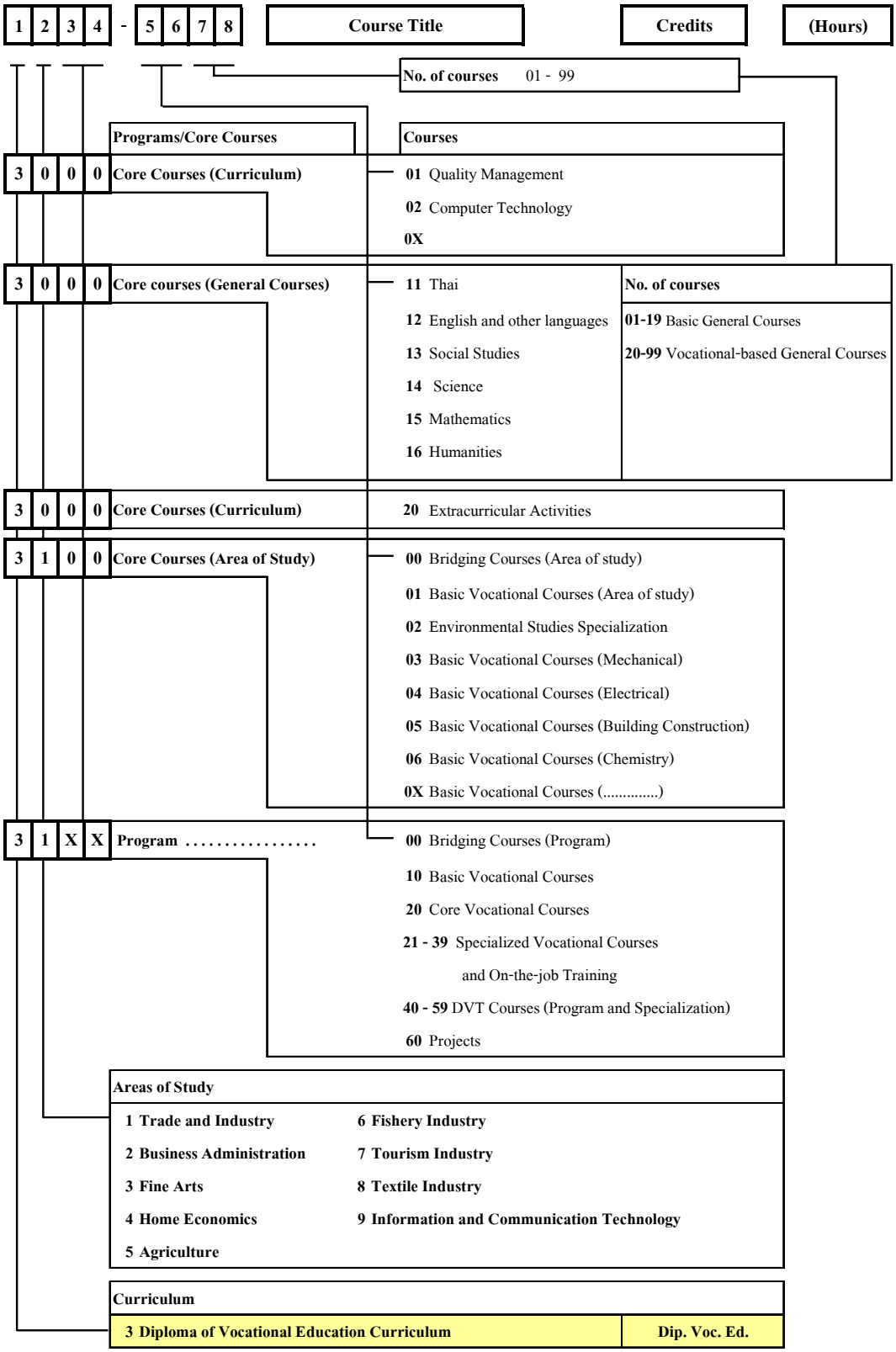
11.1 The Permanent Secretary of the Ministry of Education has the authority to correct, add, change or cancel any areas and programs of study in the 2003 Curriculum for the Diploma of Vocational Education.

11.2 The Secretary-General of the Office of Vocational Education Commission has the authority to correct, add, change or cancel any specializations in the 2003 Curriculum for the Diploma of Vocational Education.

11.3 The institutes have the authority to develop and add courses suitable for their local contexts, and these must be reported to the Office of Vocational Education Commission.

Coding System

2003 Curriculum for the Diploma of Vocational Education



Mechanical Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study: Industrial Trades
Program : Mechanical Technology
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 Mechanical Technology. 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 Mechanical Technology.
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 mechanical work.
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 Mechanical Technology.

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. Test the engine operation
7. Test the property of fuel, lubricants and fluid
8. Test the strength of materials
9. Test the operation of pneumatic and hydraulic systems
10. Inspect, maintain and repair gasoline and diesel engines
11. Inspect, maintain and repair transmission and suspension systems
12. Inspect, maintain and repair electrical system and accessories

Automotive Techniques Specialization

13. Inspect, maintain and repair gasoline fuel injection systems
14. Inspect, maintain and repair diesel fuel injection systems
15. Inspect, maintain and repair air conditioning systems
16. Inspect, maintain and repair automatic transmission

Industrial Machinery Specialization

13. Inspect, maintain and repair industrial diesel engines
14. Inspect, maintain and repair industrial steam engines
15. Inspect, maintain and repair industrial refrigeration

Ship Mechanics Specialization

13. Inspect, maintain and repair ship machinery
14. Inspect, maintain and repair ship transmission systems
15. Inspect, maintain and repair ship and equipment

Agricultural Machinery Specialization

13. Inspect, maintain and repair the plant machinery
14. Inspect, maintain and repair the machinery for animal farms
15. Inspect, maintain and repair the heavy duty machinery

Ocean Vessel Mechanics Specialization

13. Survive as boatman
14. Inspect, maintain and repair ocean vessel machinery
15. Inspect, maintain and repair ship electrical machinery
16. Inspect, maintain and repair air conditioning and cooling systems

Environmental Studies Specialization

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

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study: Industrial Trades
Program: Mechanical Technology

For the fulfillment of the program, graduates should have completed at least 93 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)		**63**	**credits**
2.1 Basic Vocational Courses	**15**	**credits**	
2.2 Core Vocational Courses	**26**	**credits**	
2.3 Specialized Vocational Courses (not less than)	**18**	**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)		**93**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Mechanical Technology 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)
3101-0001	Small Engine	3	(5)
3101-0002	Motor Cycle	3	(5)
3101-0003	Gasoline Engine	3	(5)
3101-0004	Diesel Engine	3	(5)
	Total	**19**	**(33)**

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) 63 credits

2.1 Basic Vocational Courses 15 credits

Students must take the compulsory courses (3100-0101, 3100-0103, 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)
3100-0103	Fluid Mechanics	3	(3)
3100-0107	Strength of Materials	3	(3)
3000-010X	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 30 credits

Students must take 9 compulsory courses (3100-0106,0111 and 3101-2001 to 2007) and select courses from the remainder to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3100-0106	Pneumatics and Hydraulics	3	(4)
3100-0111	Thermodynamics	3	(3)
3101-2001	Fuel and Lubricants	2	(2)
3101-2002	Internal Combustion Engine	3	(3)
3101-2003	Mechanical Laboratory	2	(3)
3101-2004	Engine Repairs	3	(5)
3101-2005	Automotive Transmission	2	(3)
3101-2006	Automotive Suspension	2	(3)
3101-2007	Automotive Electricity	3	(5)
3101-2008	Automotive Engineering	3	(3)

3101-2009	Mechanical Problem – Solving	3	(5)

2.3 Specialized Vocational Courses (not less than) 18 credits

Students must take at least 18 credits from the Specialized Vocational Courses. These can be taken from one field of specialization.

1. Automotive Techniques Specialization

Code	Course Title	Cr	(Hr)
3101-2101	Electronics Control Engine System	3	(5)
3101-2102	Pump and Nozzle Testing	3	(5)
3101-2103	Automotive Air – Conditioning	3	(5)
3101-2104	Automatic Transmission	3	(5)
3101-2105	Gasoline Engine Repairs	3	(5)
3101-2106	Diesel Engine Repairs	3	(5)
3101-2107	New Technology of Automotive	2	(2)
3101-2108	Engine Tune – Up	2	(3)
3101-2109	Automotive Electronics	2	(3)
3101-2110	Diesel Engineering	3	(3)
3101-2111	Automotive Body	3	(5)
3101-2112	Automotive Painting	3	(5)
3101-2113	Automotive Liquefied Petroleum Gas	2	(3)
3101-2114	Automotive Machine Tools	3	(5)
3101-2115	Automotive Decoration	2	(3)
3101-2116	Automotive Servicing	3	(*)
3101-4101	Automotive Technique Apprenticeship1	5	(*)
3101-4102	Automotive Technique Apprenticeship 2	5	(*)
3101-4103	Automotive Technique Apprenticeship 3	4	(*)
3101-4104	Automotive Technique Apprenticeship 4	4	(*)

2. Industrial Machinery Specialization

Code	Course Title	Cr	(Hr)
3101-2201	Mechanical Power Technology Servicing	3	(5)
3101-2202	Industrial Steam System Servicing	3	(5)
3101-2203	Industrial Refrigeration Servicing	3	(5)
3101-2204	Industrial Air Conditioning Servicing	3	(5)
3101-2205	Industrial Machinery Maintenance	3	(5)
3101-2206	Pneumatics and Hydraulics Maintenance	3	(5)
3101-2207	Production Process	3	(3)
3101-2208	Heat Transfer	3	(3)
3101-2209	Industrial Refrigeration	3	(3)
3101-2210	Industrial Air-Conditioning	3	(3)
3101-2211	Power Plant Engineering	3	(3)
3101-2212	Pump and Air Compressor	3	(3)
3101-2213	Machine Element	3	(3)
3101-2214	Industrial Energy Management	2	(2)
3101-4201	Industrial Mechanical Techniques Apprenticeship 1	5	(*)
3101-4202	Industrial Mechanical Techniques Apprenticeship 2	5	(*)
3101-4203	Industrial Mechanical Techniques Apprenticeship 3	4	(*)
3101-4204	Industrial Mechanical Techniques Apprenticeship 4	4	(*)

3. Ship Mechanics Specialization

Code	Course Title	Cr	(Hr)
3101-2301	Ship Engine Installation	3	(5)
3101-2302	Ship Transmission	2	(3)
3101-2303	Ship Impeller	2	(3)
3101-2304	Ship Electricity	3	(5)
3101-2305	Ship Engine Repairs	3	(5)
3101-2306	Ship Drawing and Reading	2	(3)
3101-2307	Resistance and Ship Power	3	(3)
3101-2308	Ship Mechanical Engineering	3	(3)
3101-2309	Ship Navigation Control Signals	2	(3)
3101-2310	Ship Piping	2	(3)
3101-2311	Instruments and Control System	2	(3)
3101-2312	Ship Machine Tools	3	(5)
3101-2313	Ship Material Handling	2	(2)
3101-2314	Ship Theory	3	(3)
3101-2315	Seamanship	2	(3)
3101-4301	Ship Mechanical Techniques Apprenticeship 1	5	(*)
3101-4302	Ship Mechanical Techniques Apprenticeship 2	5	(*)
3101-4303	Ship Mechanical Techniques Apprenticeship 3	4	(*)
3101-4304	Ship Mechanical Techniques Apprenticeship 4	4	(*)

4. Agricultural Machinery Specialization

Code	Course Title	Cr	(Hr)
3101-2401	Plant Machinery Servicing	3	(5)
3101-2402	Animal Machinery Servicing	3	(5)
3101-2403	Heavy Duty Machinery Servicing	3	(5)
3101-2404	Agriculture Mechanical Servicing	3	(5)
3101-2405	Irrigation and Pump	3	(5)
3101-2406	Food Machinery	3	(5)
3101-2407	Farm Plant Machinery Technology	3	(5)
3101-2408	Agriculture Mechanical Problem-Solving	3	(5)
3101-2409	Agriculture Refrigeration	3	(5)
3101-2410	Farm Plant Electricity	3	(5)
3101-2411	Agriculture Machinery Electronics	3	(5)
3101-2412	Agricultural Products Storage	3	(5)
3101-2413	Agricultural Products Handling and Transportation	3	(5)
3101-2414	Heavy Duty machine Element	3	(5)
3101-2415	Computer for Agriculture	2	(3)
3101-2416	Golf Course Machinery	3	(5)
3101-2417	Agricultural Administrative Planning	2	(2)
3101-2418	New Technology of Agriculture Machinery	2	(2)
3101-2419	Agricultural Products Processing Technology	2	(3)
3101-4401	Agricultural Mechanics Apprenticeship 1	5	(*)
3101-4402	Agricultural Mechanics Apprenticeship 2	5	(*)
3101-4403	Agricultural Mechanics Apprenticeship 3	4	(*)
3101-4404	Agricultural Mechanics Apprenticeship 4	4	(*)

5. Ocean Vessel Mechanics Specialization

Code	Course Title	Cr	(Hr)
3101-2501	Marine Machinery	3	(5)
3101-2502	Marine Electrical Machinery	3	(5)
3101-2503	Air - Conditioning and Refrigeration System	3	(5)
3101-2504	Welding and Machine Tools	3	(5)
3101-2505	Auxiliary Machine 1	2	(2)
3101-2506	Auxiliary Machine 2	2	(2)
3101-2507	Pump and Piping	3	(3)
3101-2508	Seamanship	2	(2)
3101-2509	Ship Structures	2	(2)
3101-2510	Personal Survival Techniques	*	(*)
3101-2511	First Aid and Fire Extinguishing	*	(*)
3101-2512	Marine Apprenticeship	*	(*)
3101-2513	Ship Machinery Maintenance	3	(5)
3101-2514	Electronics and Ship Communication	3	(5)
3101-2515	English for Machant Marine 1	2	(3)
3101-2516	English for Machant Marine 2	2	(3)
3101-2517	Maritime Law	2	(2)
3101-2518	Swimming	1	(2)
3101-2519	Arts of Self-Defence	1	(2)
3101-4501	Marine Mechanical Techniques Apprenticeship 1	5	(*)
3101-4502	Marine Mechanical Techniques Apprenticeship 2	5	(*)
3101-4503	Marine Mechanical Techniques Apprenticeship 3	4	(*)
3101-4504	Marine Mechanical Techniques Apprenticeship 4	4	(*)

Remark : Students must pass the Extra Curriculum Training Course of Marine Department to provide the opportunity of marine working according to the standard of the International Maritime Organization as follows:

1. Protection and Fire Extinguishing
2. Marine Living
3. Safety and Responsibility
4. First Aid

6. 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 Materials and the 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)
3101-6001	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.

Production Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study: Industrial Trades
Program : Production Technology
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 Production Technology. 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 Production Technology.
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 production work.
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 Production Technology.

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 production work
7. Identify appropriate materials and techniques for production work
8. Measure and inspect dimensions of workpiece

Machine Tool Specialization

9. Interpret and design drawing of mechanical parts
10. Select appropriate materials and techniques for making mechanical parts
11. Plan and control mechanical part production
12. Measure and inspect mechanical parts in production process

Jig and Fixtures Specialization

9. Interpret and design drawing jig and fixture
10. Select appropriate materials and techniques for making jig and fixtures
11. Plan and control jig and fixtures production
12. Measure, check and defect jig and fixture production
13. Assemble, install, test, analyze and solve problems in jig and fixture production

Die-making specialization

9. Interpret and design drawing die making
10. Select appropriate materials and techniques for die-making production
11. Plan and control die-making production
12. Measure and Inspect die-making production
13. Assemble, install, test, analyze and solve problems in die-making production

Mold – making specialization

9. Interpret and design drawing of mold-making
10. Select appropriate materials and techniques for mold-making production
11. Plan and control mold-making production
12. Measure and Inspect mold-making production
13. Assemble, install, test, analyze and solve problems in mold-making production

Agricultural Machinery specialization

9. Interpret and design drawing of agricultural machinery
10. Design agricultural machinery
11. Plan and control agricultural machinery production
12. Assemble, install, test, analyze and solve problems in agricultural machinery

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: Production Technology

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)		**60**	**credits**
2.1 Basic Vocational Courses	**14**	**credits**	
2.2 Core Vocational Courses	**22**	**credits**	
2.3 Specialized Vocational Courses (not less than)	**20**	**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)		**90**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Mechcanical -Machine Tool and Maintenance program, Machine Tool Trade 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	Technical Materials	2	(2)
3100-0005	Precision Measurements	2	(3)
3102-0001	Machine Element	3	(3)
3102-0002	Basic Machine Tools	3	(5)
3102-0003	Machine Tools s	3	(5)
3102-0004	Computer – aided Drawing	2	(3)
	Total	**22**	**(34)**

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) 60 credits

2.1 Basic Vocational Courses 14 credits

Students must take the compulsory courses (3100-0101, 3100-0107, 3100-0151) 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	3	(3)
3100-0107	Strength of Materials	3	(3)
3100-0151	Safety and Pollution Control	2	(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 appendi**x.**

2.2 Core Vocational Courses 22 credits

Students must take 8 compulsory courses(3102-2001 to 2004,3100-0108,0112,0115,0117) and select courses from the remainder to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3102-2001	Machining Processes	3	(5)
3102-2002	CNC Program	2	(4)
3102-2003	CNC Machine Tools	2	(4)
3102-2004	CAD/CAM Technology	3	(5)
3100-0108	Machine Elements	3	(3)
3100-0112	Industrial Materials	2	(3)
3100-0115	Manufacturing Processes	2	(2)
3100-0117	Engineering Metrology	2	(3)
3100-0118	Machine Design	3	(3)
3100-0154	Work Study	2	(2)

2.3 Specialized Vocational Courses (not less than) 20 credits

Students must take at least 20 credits from the Specialized Vocational Courses. These can be taken from one field of specialization or across different fields of specialization**.**

1. Machine Tools Specialization

Code	Course Title	Cr	(Hr)
3102-2101	Mechanical drawing	2	(3)
3102-2102	Machine Tools 1	3	(5)
3102-2103	Machine Tools 2	3	(5)
3102-2104	Machine Tools 3	3	(5)
3102-2105	Machine Tools 4	3	(5)
3102-2106	Machine Tool Technology	2	(3)
3102-2107	Automatic Machine Tool	3	(5)
3102-2108	Advanced Machine Tool Process	3	(5)
3102-2109	Computer-aided Manufacturing	2	(4)
3102-2110	Mechanical Fitting	3	(5)
3102-2111	Cost Estimation	2	(2)
3102-2112	Cutting Tool Production	3	(5)
3102-2113	Automatic Production System	3	(5)
3102-2114	Heat Treatment	3	(5)
3102-4101	Machine Tool Apprenticeship 1	5	(*)
3102-4102	Machine Tool Apprenticeship 2	5	(*)
3102-4103	Machine Tool Apprenticeship 3	5	(*)
3102-4104	Machine Tool Apprenticeship 4	5	(*)

2. Jig and Fixtures Specialization

Code	Course Title	Cr	(Hr)
3102-2201	Jig and fixture Drawing	2	(3)
3102-2202	Drill Jig Production	3	(5)
3102-2203	Machine Tool Jig and Fixture Production	3	(5)
3102-2204	Assembly Jig and Fixture Production	3	(5)
3102-2205	Checking Fixture Production	3	(5)
3102-2206	Jig and Fixture Design	2	(3)
3102-2107	Automatic Machine Tool	3	(5)
3102-2109	Computer-aided Manufacturing	2	(4)
3102-4201	Jig and Fixture Apprenticeship 1	5	(*)
3102-4202	Jig and Fixture Apprenticeship 2	5	(*)
3102-4203	Jig and Fixture Apprenticeship 3	5	(*)
3102-4204	Jig and Fixture Apprenticeship 4	5	(*)

3. Die-making Specialization

Code	Course Title	Cr	(Hr)
3102-2301	Die Drawing	2	(3)
3102-2302	Blanking and Piercing Die Production	3	(5)
3102-2303	Bending and Forming Die Production	3	(5)
3102-2304	Compound and Drawing Die Production	3	(5)
3102-2305	Progressive Die Production	3	(5)
3102-2306	Die Design	2	(3)
3102-2307	Die Maintenance and Repair	3	(5)
3102-2308	Die Technology	2	(3)
3102-2309	CAD/CAM of Computer-aided Die Manufacturing	2	(4)
3102-4301	Die Making Apprenticeship 1	5	(*)
3102-4302	Die Making Apprenticeship 2	5	(*)
3102-4303	Die Making Apprenticeship 3	5	(*)
3102-4304	Die Making Apprenticeship 4	5	(*)

4. Mold-making Specialization

Code	Course Title	Cr	(Hr)
3102-2401	Mold Drawing	2	(3)
3102-2402	Injection Mold Production	3	(5)
3102-2403	Two-plate Mold Production	3	(5)
3102-2404	Split Mold Production	3	(5)
3102-2405	Three-plate Mold Production	3	(5)
3102-2406	Mold Maintenance and Repair	3	(5)
3102-2407	Injection Mold Design	2	(3)
3102-2408	Plastic Technology	2	(3)
3102-2409	Computer-aided of Injection Mold Manufacturing	2	(4)
3102-2410	Blow Mold Production	3	(5)
3102-2411	Compression Mold Production	3	(5)
3102-2412	Extrusion Mold Production	3	(5)
3102-2413	Thermoforming Mold Production	3	(5)
3102-2414	Rubber Mold Production	3	(5)
3102-4401	Mold Making Apprenticeship 1	5	(*)
3102-4402	Mold Making Apprenticeship 2	5	(*)
3102-4403	Mold Making Apprenticeship 3	5	(*)
3102-4404	Mold Making Apprenticeship 4	5	(*)

5. Agricultural Machinery Specialization

Code	Course Title	Cr	(Hr)
3102-2501	Agricultural Machinery Drawing	2	(3)
3102-2502	Agricultural Machinery Parts Assembling	3	(5)
3102-2503	Plant Machinery Design	2	(3)
3102-2504	Plant Machinery Production	3	(5)
3102-2505	Aquatic animal Machinery Design	2	(3)
3102-2506	Aquatic animal Machinery Production	3	(5)
3102-2507	Poultry Machinery Design	2	(3)
3102-2508	Poultry Machinery Production	3	(5)
3102-2509	Cattle Machinery Design	2	(3)
3102-2510	Cattle Machinery Production	3	(5)

3102-2511	Industrial Agricultural Machinery Design	2	(3)
3102-2512	Industrial Agricultural Machinery Production	3	(5)
3102-4501	Agricultural Machinery Apprenticeship 1	5	(*)
3102-4502	Agricultural Machinery Apprenticeship 2	5	(*)
3102-4503	Agricultural Machinery Apprenticeship 3	5	(*)
3102-4504	Agricultural Machinery Apprenticeship 4	5	(*)

6. 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)
3102-6001	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.

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 appendi**x.**

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 Handing	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 Apprenticeship1	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.

Electrical Power Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Electrical Power Technology
Objectives

The program aims at providing students with knowledge, skills, abilities, attitudes and experience which will enable them to perform as skilled technicians in the field of Electrical Power Technology. 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 Electrical Power Technology.
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 Electrical Power work.
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 Electrical Power Technology.

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. Design electrical drawing systems using CAD
7. Analyze electrical circuits using electrical theories
8. Test electrical machines
9. Control electrical equipment using controller
10. Design and install electrical systems
11. Fix and produce electrical and electronic equipment
12. Control driving equipment using Pneumatics and hydraulics

Electrical Machines Specialization

13. Test and analyze characteristic of electrical machines
14. Install electrical machines following the blueprint
15. Control electrical machines using electronic controller
16. Fix and maintain electrical machines

Electrical Installation Specialization

13 Design electrical system using computer
14 Install electrical equipment following the blueprint
15 Inspect, maintain and repair electrical systems

Refrigeration and Air-condition Specialization

13 Design of refrigeration and air-condition systems
14 Install refrigeration and air-condition equipment following the blueprint
15 Repair and maintain refrigeration and air-condition equipment

Industrial Instruments Specialization

13 Inspect and adjust instruments and controllers following the manual
14 Install and repair instruments, controllers and accessories following the manual

Building System Specialization

13. Control, fix and maintain electrical building systems
14. Control, fix and maintain electrical equipment
15. Inspect and control the safety system of building

Distribution System Maintenance Specialization

13. Repair and maintain electrical equipment in distribution system
14. Inspect and maintain pumps and motors
15. Inspect and maintain refrigeration and air- conditioning systems

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Electrical Power Technology

For the fulfillment of the program, graduates should have completed at least 95 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)		**65**	**credits**
2.1 Basic Vocational Courses	**13 credits**		
2.2 Core Vocational Courses	**30 credits**		
2.3 Specialized Vocational Courses (not less than)	**18 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)		**95**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Electrical Power 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)
3104-0001	Electrical Drawing	2	(4)
3104-0002	Electrical Instruments and Circuits	3	(5)
3104-0003	Basic Electrical Machines	2	(4)
3104-0004	Interior and Exterior of Electrical Installation	3	(5)
3104-0005	Electrical Motors and Controls	3	(5)
	Total	**20**	**(36)**

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) 65 credits

2.1 Basic Vocational Courses 13 credits

Students must take the compulsory courses (3104-1001 to -1003) and select one course from 3000-100X and one from 3000-020X to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3104-1001	Electric Circuits	3	(4)
3104-1002	Electrical Instruments	2	(3)
3104-1003	Applied Digital Circuits	2	(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 appendi**x.**

2.2 Core Vocational Courses 30 credits

Students must take 8 compulsory courses(3104-2001 to 1008) and select courses from the remainder to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3104-2001	Electrical Installation 1	3	(4)
3104-2002	Electrical Machines 1	3	(4)
3104-2003	Electrical Machines 2	3	(4)
3104-2004	Electrical Design	3	(3)
3104-2005	Electrical Drafting CAD	3	(4)
3104-2006	Industrial Electronics	3	(4)
3104-2007	Industrial Control Systems	3	(4)
3104-2008	Electrical Transmission and Distribution	3	(3)
3104-2009	Electrical Mathematics	3	(3)
3104-2010	Electrical Circuit Analysis	3	(3)
3104-2011	Microcontrollers	3	(4)
3100-0106	Pneumatics and Hydraulics	3	(4)

2.3 Specialized Vocational Courses (not less than) 18 credits

Students must take at least 18 credits from the Specialized Vocational Courses. These can be taken from one field of specialization or across different fields of specialization**.**

1. Electrical Machines Specialization

Code	Course Title	Cr	(Hr)
3104-2101	Power Electronics	3	(4)
3104-2102	Electrical Power Drives	3	(4)
3104-2103	Power Plants	2	(2)
3104-2104	Electrical Machines 3	3	(4)
3104-2105	Electrical Machine Maintenance	3	(4)
3104-2106	Electromagnetics	2	(2)
3104-2107	Special Problems in Electrical Machines	3	(*)
3104-2108	Advanced Electrical Machines 1	3	(*)
3104-2109	Advanced Electrical Machines 2	3	(*)
3104-2208	Technology of Building Systems	3	(4)
3104-2403	Microprocessor application	3	(4)
3104-4101	Electrical Machines Apprenticeship 1	5	(*)
3104-4102	Electrical Machines Apprenticeship 2	5	(*)
3104-4103	Electrical Machines Apprenticeship 3	4	(*)
3104-4104	Electrical Machines Apprenticeship 4	4	(*)

2. Electrical Installation Specialization

Code	Course Title	Cr	(Hr)
3104-2103	Power Plant	2	(2)
3104-2201	Electrical Installation 2	3	(4)
3104-2202	Illumination	2	(2)
3104-2203	Estimation Electrical System	2	(2)
3104-2204	Building Transportation Technology	3	(4)
3104-2205	Electrical System Protection	2	(2)
3104-2206	Communication and Alarm system	3	(4)
3104-2207	Electrical System Maintenance	3	(4)
3104-2208	Building System Technology	3	(4)
3104-2209	Special Problem in Electrical Installation	3	(*)
3104-2210	Advanced Electrical Installation	3	(*)
3104-4201	Electrical Installation Apprenticeship 1	5	(*)
3104-4202	Electrical Installation Apprenticeship 2	5	(*)
3104-4203	Electrical Installation Apprenticeship 3	4	(*)
3104-4204	Electrical Installation Apprenticeship 4	4	(*)

3. Refrigeration and Air-Condition Specialization

Code	Course Title	Cr	(Hr)
3100-0111	Thermodynamic	3	(3)
3104-2301	Industrial Air-Condition	3	(4)
3104-2302	Industrial Refrigeration	3	(4)
3104-2303	Refrigeration Equipments Control	3	(4)
3104-2304	Air Distribution and Water Supply system	2	(2)
3104-2305	Transport Refrigeration and Air- Condition	3	(3)
3104-2306	Refrigeration and Air- Condition Maintenance	3	(4)
3104-2307	Special Problem in Refrigeration and Air- Condition	3	(*)
3104-2308	Advance Refrigeration and Air- Condition	3	(*)
3104-4301	Refrigeration and Air- Condition Apprenticeship 1	5	(*)
3104-4302	Refrigeration and Air- Condition Apprenticeship 2	5	(*)
3104-4303	Refrigeration and Air- Condition Apprenticeship 3	4	(*)
3104-4304	Refrigeration and Air- Condition Apprenticeship 4	4	(*)

4. Industrial Instruments Specialization

Code	Course Title	Cr	(Hr)
3104-2401	Instrumentation	3	(4)
3104-2402	Process Controller	3	(4)
3104-2403	Microprocessor Applications	3	(4)
3104-2404	Instrumentation and Controller Technology	3	(4)
3104-2405	Advance Instrumentation and Process Control	3	(4)
3104-2406	Industrial Tools and Equipments	2	(2)
3120-2004	Fluid Mechanics & Thermodynamics	3	(3)
3120-2006	Sensors and Transducers	3	(4)
3120-2103	Equipment Industrial Instruments and Controller	2	(3)
3120-2104	Instrument and Control Procedures	2	(2)
3104-4401	Industrial Instruments Apprenticeship 1	5	(*)
3104-4402	Industrial Instruments Apprenticeship 2	5	(*)
3104-4403	Industrial Instruments Apprenticeship 3	4	(*)
3104-4404	Industrial Instruments Apprenticeship 4	4	(*)

5. Distribution System Maintenance Specialization

Code	Course Title	Cr	(Hr)
3104-2207	Maintenance Electrical System	3	(4)
3104-2501	Refrigeration	3	(4)
3104-2502	Refrigeration and Air-Condition Maintenance	3	(4)
3104-2503	Industrial Motor Maintenance	3	(4)
3104-2504	Industrial Pump Maintenance	3	(4)
3104-2505	Instruments and Protection Equipments In Distribution System	3	(5)
3104-2506	Maintenance Electrical Equipment and Distribution System	3	(4)
3104-2507	Special Problem in Maintenance Distribution System	3	(4)
3104-4501	Distribution System Maintenance Apprenticeship 1	5	(*)
3104-4502	Distribution System Maintenance Apprenticeship 2	5	(*)
3104-4503	Distribution System Maintenance Apprenticeship 3	4	(*)
3104-4504	Distribution System Maintenance Apprenticeship 4	4	(*)

6. Building System Specialization

Code	Course Title	Cr	(Hr)
3104-2103	Power Plant	2	(2)
3104-2104	Electrical Machines 3	3	(4)
3104-2201	Electrical Installation 2	3	(4)
3104-2202	Illumination	2	(2)
3104-2204	Transportation Technology	3	(4)
3104-2206	Communication and Alarm system	3	(4)
3104-2208	Building System Technology	3	(4)
3104-2301	Industrial Air-Condition	3	(4)
3104-2306	Refrigeration and Air- Condition Maintenance	3	(4)
3104-2403	Microprocessor Applications	3	(4)
3104-2601	Design Construction and Building Sanitary	3	(3)
3104-2602	Electrical Building System	3	(4)
3104-2603	Maintenance Building Utilities and Facilities System	3	(4)
3104-2604	Energy Conservation	3	(4)
3104-2605	Safety in Building System	3	(4)
3104-4601	Building System Specialization Apprenticeship	5	(*)
3104-4602	Building System Specialization Apprenticeship	5	(*)
3104-4603	Building System Specialization Apprenticeship	4	(*)
3104-4604	Building System Specialization Apprenticeship	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)
3104-6001	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.

Electronics Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Electronics Technology
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 Electronics. 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 Electronics Technology.
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 careers.
3. To promote critical thinking, problem-solving skills and creative thinking; and to provide the ability to bring the technology into the development of electronic work.
4. To promote good personality, responsibility to themselves, family and society, morals and ethics; and good manners in their careers.
5. To provide the ability to work in industrial workplaces or in self-employment in the field of Electronics Technology.

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 attribution of technicians
6. Install, test, analyze electronic devices, circuits and instruments
7. Assemble, install, test, and maintain computer system and network

Industrial Electronics Specialization

8. Install and control industrial electronic systems
9. Maintain industrial electronic systems

Computer Technology Specialization

8. Install and control computers and peripherals
9. Maintain computers and peripherals

Telecommunication Systems Specialization

8. Install, control, and maintain radio communication systems and telephones
9. Install, control and maintain telecommunication systems

Audio/Video Systems Specialization

8. Install and control audio/video systems
9. Maintain audio/video systems

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study: Industrial Trades
Program: Electronics Technology

For the fulfillment of the program, graduates should have completed at least 92 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)		**62**	**credits**
2.1 Basic Vocational Courses	**15**	**credits**	
2.2 Core Vocational Courses	**28**	**credits**	
2.3 Specialized Vocational Courses (not less than)	**15**	**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)		**92**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Electronics 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)
3105-0001	Basic Electric Circuits and Measurements	3	(4)
3105-0002	Electronics Drawing	2	(3)
3105-0003	Basic Electronics Circuits	2	(3)
3105-0004	Basic Pulse and Digital Circuits	2	(3)
3105-0005	Basic Audio and Video Systems	3	(4)
	Total	**19**	**(30)**

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) 62 credits

2.1 Basic Vocational Courses 15 credits

Students must take the compulsory courses (3105-1001- 3105-1004) and select one course from 3000-100X and one from 3000-020X to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3105-1001	Electric Circuit Analysis	3	(4)
3105-1002	Electrical and Electronics Instrument	2	(3)
3105-1003	Electronics Circuit Analysis	2	(3)
3105-1004	Digital Techniques	2	(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 appendi**x.**

2.2 Core Vocational Courses 22 credits

Students must take 10 compulsory courses (3105-2001 to 3105-2010) and select courses from the remainder to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3105-2001	High Frequency Electronic Circuit Analysis	2	(3)
3105-2002	Pulse Techniques	2	(3)
3105-2003	Op-Amp and Linear IC	2	(3)
3105-2004	Industrial Electronics	2	(3)
3105-2005	Audio Systems	2	(3)
3105-2006	Video Systems	2	(3)
3105-2007	Radio Receiver and Transmitter Techniques	2	(3)
3105-2008	Telecommunication Systems	2	(3)
3105-2009	Telephone Systems	2	(3)
3105-2010	Computer Network Systems	2	(3)
3105-2011	Digital Circuit Designs	2	(3)
3105-2012	Microprocessor	2	(3)
3105-2013	Interfaced Techniques	2	(3)
3105-2014	Microcontroller	2	(3)
3105-2015	Assembly Language Programming	2	(3)
3105-2016	Analog Communication Systems	2	(3)
3105-2017	Digital Communication Systems	2	(3)
3105-2018	Electronic CAD	2	(3)
3105-2019	Electric & Electronics Mathematics	3	(3)
3105-2020	Electromagnetic Field Fundamental	3	(3)

2.3 Specialized Vocational Courses (not less than) 15 credits

Students must take at least 15 credits from the Specialized Vocational Courses. These can be taken from one field of specialization or across different fields of specialization.

1. Industrial Electronics Specialization

Code	Course Title	Cr	(Hr)
3100-0106	Pneumatics and Hydraulics	3	(4)
3105-2101	Power Electronics	3	(4)
3105-2102	Industrial Electronic Instruments	3	(4)
3105-2103	Programmable logic control	3	(4)
3105-2104	Industrial Robots	3	(4)
3105-2105	Special Problems in Industrial Electronics 1	3	(4)
3105-2106	Special Problems in Industrial Electronics 2	3	(4)
3105-2107	Advanced Topics in Industrial Electronics 1	3	(4)
3105-2108	Advanced Topics in Industrial Electronics 2	3	(4)
3105-2109	Industrial Electronic Projects	3	(4)
3105-4101	Industrial Electronic Apprenticeship 1	4	(*)
3105-4102	Industrial Electronic Apprenticeship 2	4	(*)
3105-4103	Industrial Electronic Apprenticeship 3	4	(*)
3105-4104	Industrial Electronic Apprenticeship 4	4	(*)

2. Computer Technology Specialization

Code	Course Title	Cr	(Hr)
3105-2201	Computer and peripheral devices services	3	(4)
3105-2202	Internet System Services	3	(4)
3105-2203	Computer and Peripheral Devices Troubleshooting	3	(4)
3105-2204	Industrial Computer Services	3	(4)
3105-2205	Special Problems in Computer 1	3	(4)
3105-2206	Special Problems in Computer 2	3	(4)
3105-2207	Advanced Topics in Computer 1	3	(4)
3105-2208	Advanced Topics in Computer 2	3	(4)
3105-2209	Computer Projects	3	(4)
3105-4201	Computer Techniques Apprenticeship 1	4	(*)
3105-4202	Computer Techniques Apprenticeship 2	4	(*)
3105-4203	Computer Techniques Apprenticeship 3	4	(*)
3105-4204	Computer Techniques Apprenticeship 4	4	(*)

3. Telecommunication Systems Specialization

Code	Course Title	Cr	(Hr)
3105-2301	Fiber Optic Communication Systems	3	(4)
3105-2302	Satellite Communications	3	(4)
3105-2303	Microwave Communication Systems	3	(4)
3105-2304	Transmission Lines and Antennas Systems	3	(4)
3105-2305	RADAR and SONAR Systems	3	(4)
3105-2306	Special Problems in Telecommunication 1	3	(4)
3105-2307	Special Problems in Telecommunication 2	3	(4)
3105-2308	Advanced Topics in Telecommunication 1	3	(4)
3105-2309	Advanced Topics in Telecommunication 2	3	(4)
3105-2310	Telecommunication Projects	3	(4)
3105-4301	Telecommunication Systems Apprenticeship 1	4	(*)
3105-4302	Telecommunication Systems Apprenticeship 2	4	(*)
3105-4303	Telecommunication Systems Apprenticeship 3	4	(*)
3105-4304	Telecommunication Systems Apprenticeship 4	4	(*)

4. Audio/Video Systems Specialization

Code	Course Title	Cr	(Hr)
3105-2401	Radio and Television Broadcasting Systems	3	(4)
3105-2402	CCTV, CATV, MATV Systems	3	(4)
3105-2403	Studio Systems	3	(4)
3105-2404	Special Problems in Audio and Video Systems 1	3	(4)
3105-2405	Special Problems in Audio and Video Systems 2	3	(4)
3105-2406	Advanced Topics in Audio and Video Systems 1	3	(4)
3105-2407	Advanced Topics in Audio and Video Systems 2	3	(4)
3105-2408	Audio and Video Projects	3	(4)
3105-4401	Audio and Video Systems Apprenticeship 1	4	(*)
3105-4402	Audio and Video Systems Apprenticeship 2	4	(*)
3105-4403	Audio and Video Systems Apprenticeship 3	4	(*)
3105-4404	Audio and Video Systems Apprenticeship 4	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)**
3105-6001	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.

Building Construction Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study: Industrial Trades
Program : Building Construction Technology
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 Building Construction Technology 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 Building Construction Technology.
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 building construction work.
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 Building Construction Technology.

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. Draw and interprete construction drawings
7. Determine materials and techniques following work process
8. Inspect and test construction materials

Building Construction Techniques Specialization

9. Analyze building system, equipment system and structure
10. Select appropriate materials and building construction techniques
11. Plan, prepare and install construction work determined
12. Manage the construction works law
13. Inspect to construction works accordinng to the law

Construction Inspection Techniques Specialization

9. Analyze building system, equipment system and building structure according to the law
10. Manage the construction works related to law
11. Inspect and report the construction
12. Cooperate with organization

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study: Industrial Trades
Program: Building Construction Technology

For the fulfillment of the courses, graduates should have completed at least 94 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)		**64**	**credits**
2.1 Basic Vocational Courses	**12 credits**		
2.2 Core Vocational Courses	**32 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)		**94**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Building Construction Program, Building Construction Specialization, Civil Construction Specialization 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)
3106-0001	Structural Mechanics	2	(2)
3106-0002	Construction Materials	2	(2)
3106-0003	Construction Techniques	2	(2)
3106-0004	Woodworking Practice	2	(4)
3106-0005	Construction Workshop	2	(4)
3106-0006	Construction Estimating	2	(3)
3106-0007	Construction Drawing	2	(4)
3106-0008	Surveying	2	(3)
	Total	**16**	**(24)**

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)
3000-120X	English (Elective)	1	(2)
3000-120X	English (Elective)	1	(2)
3000-140X	Science (Elective)	3	(4)
3000-1521	Mathematics 2	3	(3)
3000-1525	Calculus 1	3	(3)

2. Vocational Courses (not less than) 64 credits

2.1 Basic Vocational Courses 12 credits

Students must take the compulsory courses (3100-0101, 3100-0107) and select one course from 3000-010X and one from 3000-020X to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3100-0101	Engineering Mechanics	3	(3)
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 appendi**x.**

2.2 Core Vocational Courses 32 credits

Code	Course Title	Cr	(Hr)
3106-2001	Sanitation in Building	2	(2)
3106-2002	Construction Machinery	2	(2)
3106-2003	Construction Surveying	2	(3)
3106-2004	Construction Techniques 1	2	(2)
3106-2005	Construction Drawing 1	3	(6)
3106-2006	Construction Estimating 1	2	(3)
3106-2007	Concrete Technology	3	(4)
3106-2008	Material Testing	2	(3)
3106-2009	Theory of Structures	3	(3)
3106-2010	Soil Mechanics	3	(4)
3106-2011	Computer Aided Construction Drawing	2	(3)
3106-2012	Reinforce Concrete Design	3	(3)
3106-2013	Timber and Steel Design	3	(3)

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. Construction Techniques Specialization

Code	Course Title	Cr	(Hr)
3106-2101	Construction Drawing 2	3	(6)
3106-2102	Building Equipment	2	(2)
3106-2103	Plumbing System and Sanitary Services	2	(6)
3106-2104	Construction Law	2	(2)
3106-2105	Building Construction 1	2	(6)
3106-2106	Building Construction 2	2	(6)
3106-2107	Building Construction 3	2	(6)
3106-2108	Temporary Structures	2	(2)
3106-2109	Special Building Construction	2	(2)
3106-2110	Building Construction Project	2	(6)
3106-2111	Construction Techniques 2	2	(2)
3106-2112	Hydraulics 1	2	(2)
3106-2113	Hydraulics 2	1	(3)
3106-2114	Structural analysis	3	(3)
3106-2115	Computer Application Software	2	(4)
3106-2116	Route Surveying	1	(3)
3106-2117	Irrigation	3	(3)
3106-2118	Geology	2	(2)
3106-2119	Traffic Engineering	2	(2)
3106-2120	Environmental Engineering	2	(2)
3106-2121	Highway Engineering	3	(3)
3106-4101	Construction Technique apprenticeship 1	4	(*)
3106-4102	Construction Technique apprenticeship 2	4	(*)
3106-4103	Construction Technique apprenticeship 3	4	(*)
3106-4104	Construction Technique apprenticeship 4	4	(*)

2. Construction Inspection Techniques Specialization

Code	Course Title	Cr	(Hr)
3106-2201	Drawing Reading and cost Estimating	2	(2)
3106-2202	Construction Management	2	(2)
3106-2203	Technique for Construction Control	2	(2)
3106-2204	Water Supply and Sewage System	2	(2)
3106-2205	Surveying and Leveling	2	(4)
3106-2206	Electrical Work in Building	2	(2)
3106-2207	Underground Structure	2	(2)
3106-2208	Disaster of Building	2	(2)
3106-2209	Construction Control Law	2	(2)
3106-2210	Construction Control 1	2	(6)
3106-2211	Construction Control 2	2	(6)
3106-2212	Construction Control Project	2	(6)
3106-2213	Law Contract and Construction Items	2	(2)
3106-2214	Construction Supervision	2	(2)
3106-2215	Industrial Economy of Construction	2	(2)

3106-2216	Construction Inspection	2	(2)
3106-2217	Construction Safety	2	(2)
3106-2218	Construction Technology	2	(2)
3106-2219	Administration and Maintenance of Building	2	(2)
3106-2220	Equipment Control in Building	2	(2)
3106-2221	Administration and Management of Construction	2	(2)
3106-2222	Sanitary Service in Building	2	(2)
3106-2223	Control and Report writing of Construction	2	(2)
3106-2224	Contract and Construction Administration	2	(2)
3106-2225	Modular System	2	(2)
3106-2226	Construction Planning	2	(2)
3106-2227	Construction Practice	2	(6)
3106-4201	Construction Inspection Technique apprenticeship1	4	(*)
3106-4202	Construction Inspection Technique apprenticeship 2	4	(*)
3106-4203	Construction Inspection Technique apprenticeship 3	4	(*)
3106-4204	Construction Inspection Technique apprenticeship 4	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)
3106-6001	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.

Furniture Industry and Interior Decoration

2003 Curriculum for Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Furniture Industry and Interior Decoration
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 Furniture Industry and Interior Decoration. 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 Furniture Industry and Interior Decoration.
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 furniture and interior decoration work.
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 Furniture Industry and Interior Decoration.

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. Draw and interprete furniture and interior decoration drawngs
7. Design furniture and interior decoration work
8. Produce wood furniture

Furniture Production Specialization

9. Draw and design furniture work
10. Divide materials; equipment and cost estimation of furniture
11. Produce woodworking product

Interior Designing Specialization

9. Draw and design the interior decoration of a house and an office
10. Divide materials, interior decorative equipment of a house and an office
11. Estimate the interior decorative equipment of a house and an office

Interior Decoration Specialization

9. Organize and manage the interior decoration
10. Do the interior decoration
11. Estimate the interior decorative work

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Furniture Industry and Interior Decoration

For the fulfillment of the courses, graduates should have completed at least 92 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)		**62**	**credits**
2.1 Basic Vocational Courses	**15 credits**		
2.2 Core Vocational Courses	**21 credits**		
2.3 Specialized Vocational Courses (not less than)	**22 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)		**92**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Furniture Industry and Interior Decoration 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)
3107-0001	Draft and Art	2	(4)
3107-0002	Basic Interior Decorative Drawing and Design	3	(7)
3107-0003	Furniture Materials and Equipment	2	(3)
3107-0004	Basic Woodworking and Machinery	3	(7)
	Total	**10**	**(21)**

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) 62 credits

2.1 Basic Vocational Courses 15 credits

Students must take the compulsory courses (3100-0107, 3100-0151, 3100-0154, 3107-1001) and select one course from 3000-010X and one from 3000-020X to fulfill the requirements.

Code	Course Title	Cr (Hr)
3100-0107	Strength of Materials	3 (3)
3100-0151	Safety and Pollution Control	2 (3)
3100-0154	Work Study	2 (2)
3107-1001	Basic Design	2 (2)
3000-100X	Quality Management (Elective)	3 (3)
3000-020X	Computer Technology (Elective)	3 (4)

Remarks : The code with X will be chosen from the appendi**x**

2.2 Core Vocational Courses 21 credits

Code	Course Title	Cr (Hr)
3107-2001	Wood Technology	2 (2)
3107-2002	History of Furniture	2 (2)
3107-2003	Furniture - Drawing	2 (3)
3107-2004	Design and Interior Decorative Techniques	2 (3)
3107-2005	Principle of Design	2 (3)
3107-2006	Coloring and Surface Finishing Technology	2 (2)
3107-2007	Interior Decoration	3 (4)
3107-2008	Furniture Analysis and Development	3 (3)
3107-2009	Woodworking Machinery Technology	3 (4)

2.3 Specialized Vocational Courses (not less than) 22 credits

Students must take at least 22 credits from the Specialized Vocational Courses. These can be taken from one field of specialization.

1. Furniture Industry Technology Specialization

Code	Course Title	Cr (Hr)
3107-2101	Furniture Separation	2 (2)
3107-2102	Furniture Design	2 (3)
3107-2103	Jig and Fixtures Design	2 (3)
3107-2104	Knock Down Furniture production	3 (4)
3107-2105	Knock Down Materials and Fixture Equipment	2 (3)
3107-2106	Furniture Industrial Finishing	3 (4)
3107-2107	Solid Wood Furniture Production	3 (4)
3107-2108	Panels Furniture Production	3 (4)
3107-2109	Furniture Industry Project	3 (4)
3107-2110	Veneer Bending	3 (4)
3107-2111	Woodworking Machinery Maintenance	2 (2)
3107-2112	Furniture Upholstery	3 (4)
3107-2113	Pneumatics	2 (2)
3107-2114	Wood Lathing	3 (3)
3107-2115	Cost Estimation of Furniture-production	3 (3)
3107-2116	C.N.C. Technology	2 (2)
3107-2117	Industrial Electricity	2 (2)
3107-2118	Industrial Management and Administration	3 (3)
3107-2119	Engineering Mechanics	3 (3)
3107-2120	Computer Aided Furniture Drawing	3 (3)
3107-4101	Furniture Production apprenticeship1	6 (*)
3107-4102	Furniture Production apprenticeship 2	6 (*)
3107-4103	Furniture Production apprenticeship 3	5 (*)
3107-4104	Furniture Production apprenticeship 4	5 (*)

2. Interior Design Specialization

Code	Course Title	Cr (Hr)
3107-2201	Housing Interior Design	2 (3)
3107-2202	Office Interior Design	2 (3)
3107-2203	Housing Interior Drawing	3 (4)
3107-2204	Office Interior Drawing	3 (4)
3107-2205	Display and Exhibition	3 (4)
3107-2206	Decorative Product Design	2 (3)
3107-2207	Computer Aided Inferior Drawing	3 (4)
3107-2208	Interior Architectural Design and Drawing 1	3 (4)
3107-2209	Interior Architectural Design and Drawing 2	3 (4)
3107-2210	Interior Decorative Design Project	3 (4)
3107-2211	Interior Decorative Design and Drawing	3 (4)
3107-2212	Interior Decorative Management and Administration	3 (4)
3107-2213	Interior Decoration 1	3 (4)
3107-2214	Model	2 (2)
3107-2215	Art Composition	2 (2)
3107-2216	Interior Decorative Materials and Equipment	2 (2)
3107-2217	Folk Arts and Crafts	2 (2)

3107-2218	Cost Estimation	2 (2)
3107-4201	Interior Decorative Design and Drawing apprenticeship 1	6 (*)
3107-4202	Interior Decorative Design and Drawing apprenticeship 2	6 (*)
3107-4203	Interior Decorative Design and Drawing apprenticeship 3	5 (*)
3107-4204	Interior Decorative Design and Drawing apprenticeship 4	5 (*)

3. Interior Decoration Specialization

Code	Course Title	Cr (Hr)
3107-2301	Interior Decorative Techniques	2 (2)
3107-2302	Interior Decorative Planning and Control	2 (3)
3107-2303	Housing Interior Decoration	3 (4)
3107-2304	Office Interior Decoration	3 (4)
3107-2305	Interior Materials and Equipment Fixing	3 (4)
3107-2306	Interior Decorative cost Estimation	2 (3)
3107-2307	Interior Painting	3 (4)
3107-2308	Tax Management and Labour Law	2 (3)
3107-2309	Interior Decoration 2	3 (4)
3107-2310	Interior Decorative Management and Administration	3 (4)
3107-2311	Wall and Ceiling Decoration	3 (4)
3107-2312	Furniture Built -in	3 (4)
3107-2313	Sand Spraying and Glass	3 (3)
3107-2314	Rattan Work	3 (3)
3107-2315	Wood Carving	3 (3)
3107-2316	Interior Decorative Project	3 (4)
3107-2317	Building Equipment	2 (2)
3107-4301	Interior Decorative apprenticeship 1	6 (*)
3107-4302	Interior Decorative apprenticeship 2	6 (*)
3107-4303	Interior Decorative apprenticeship 3	5 (*)
3107-4304	Interior Decorative apprenticeship 4	5 (*)

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)
3107-6001	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.

Architectural Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Architectural Technology
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 Architectural Technology. 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 Architectural Technology.
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 architectural work.
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 Architectural Technology.

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. Design architectural drawing
7. Draw building plan for building construction
8. Manage and control building construction work
9. Estimate the cost of building construction work

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Architectural Technology

For the fulfillment of the courses, graduates should have completed at least 98 credits from the 5 groups of courses below.

1. General Courses (not less than)		**21**	**credits**
1.1 Basic General Courses	**13 credits**		
1.2 Vocational-based General Courses (not less than)	**8 credits**		
2. Vocational Courses (not less than)		**71**	**credits**
2.1 Basic Vocational Courses	**15 credits**		
2.2 Core Vocational Courses	**37 credits**		
2.3 Specialized Vocational Courses (not less than)	**15 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)		**98**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Architectural 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)
3108-0001	Art and Sketch For Design	2	(4)
3108-0002	Building Construction Drawing	3	(6)
3108-0003	Fundamental Architectural Design	3	(6)
3108-0004	Perspective and Presentation	3	(6)
3108-0005	Materials and Building Construction	3	(3)
3108-0006	Building Construction Law	1	(1)
3108-0007	Computer - aided Architectural Drawing	2	(4)
	Total	**17**	**(30)**

1. General Courses (not less than) 21 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) 8 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)

2. Vocational Courses (not less than) 71 credits

2.1 Basic Vocational Courses 15 credits

Students must take the compulsory courses (3100-0107, 3108-1001 to 1003) and select one course from 3000-010X and one from 3000-020X to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3100-0107	Strength of Materials	3	(3)
3108-1001	Construction Estimation	2	(2)
3108-1002	Law and Contract	2	(2)
3108-1003	Thai Architecture 1	2	(4)
3000-100X	Quality Management (Elective)	3	(3)
3000-020X	Computer Technology (Elective)	3	(4)

Remarks : The code with X will be choose from the appendi**x**

2.2 Core Vocational Courses 37 credits

Code	Course Title	Cr	(Hr)
3108-2001	Architectural Design 1	3	(6)
3108-2002	Architectural Design 2	3	(6)
3108-2003	Architectural Design 3	3	(6)
3108-2004	Architectural Design 4	3	(6)
3108-2005	Construction Drawing 1	3	(6)
3108-2006	Construction Drawing 2	3	(6)
3108-2007	Construction Drawing 3	3	(6)
3108-2008	Theory of structure	2	(2)
3108-2009	Timber and Steel Structure Design	2	(2)
3108-2010	Reinforced Concrete Design	2	(2)
3108-2011	Materials and Construction 1	2	(2)
3108-2012	History of Architecture	2	(2)
3108-2013	Environment Condition 1	2	(2)
3108-2014	Urban Planning	2	(2)
3108-2015	Building Equipment 1	2	(2)

2.3 Specialized Vocational Courses (not less than) 15 credits

Code	Course Title	Cr	(Hr)
3108-2101	Materials and Construction 2	2	(2)
3108-2102	Building Equipment 2	2	(2)
3108-2103	Architectural Practice 1	5	(1)0
3108-2104	Architectural Practice 2	4	(8)
3108-2105	Thai Architecture 2	2	(2)
3108-2106	Environmental Condition 2	2	(2)
3108-2107	Construction Management	2	(2)
3108-2108	Landscape Architectural drawing and Design 1	2	(4)
3108-2109	Interior Architectural Drawing and Design 1	2	(4)
3108-2110	Computer Aided Architectural Drawing	2	(4)
3108-2111	Photography	2	(3)
3108-2112	Building Disaster	2	(2)
3108-2113	Surveying	2	(4)
3108-2114	Materials and Interior Decorative Equipment	2	(2)
3108-2115	Materials and Landscape Gardening Equipment	2	(2)
3108-2116	Architectural Project Proposal	2	(2)
3108-2117	Architectural Project Presentation	3	(*)
3108-2118	Landscape Architectural Drawing and Design 2	2	(4)
3108-2119	Interior Architectural Drawing and Design 2	2	(4)
3108-2120	Computer Aided Landscape Architectural Drawing 2	2	(4)
3108-4101	Architecture Techniques Apprenticeship 1	4	(*)
3108-4102	Architecture Techniques Apprenticeship 2	4	(*)
3108-4103	Architecture Techniques Apprenticeship 3	4	(*)
3108-4104	Architecture Techniques Apprenticeship 4	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)
3108-6001	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.

Surveying Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Surveying Technology
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 Surveying Technology 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 Surveying Technology.
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 surveying work.
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 Surveying Technology.

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. Test the engineering materials
7. Analyze and design basic structures
8. Plan the surveying work in engineering
9. Control and inspect the surveying work
10. Survey for map drawing and land management
11. Conduct remote surveys by photogrammetry and satellite information

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Surveying Technology

For the fulfillment of the courses, graduates should have completed at least 94 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)		**64**	**credits**
2.1 Basic Vocational Courses	**12 credits**		
2.2 Core Vocational Courses	**31 credits**		
2.3 Specialized Vocational Courses (not less than)	**17 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)		**94**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Surveying 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)
3109-0001	Surveying	3	(5)
3109-0002	Leveling	3	(5)
3109-0003	Surveying Computation	2	(3)
3109-0004	Survey - Drawing	3	(5)
3109-0005	Spherical Trigonometry	2	(2)
3109-0006	Route - Surveying	3	(5)
3109-0007	Photogrametry	2	(2)
	Total	**18**	**(27)**

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) 64 credits

2.1 Basic Vocational Courses 12 credits

Students must take the compulsory courses (3100-0101, 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	3	(3)
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 31 credits

Code	Course Title	Cr	(Hr)
3109-2001	Survey - Planning	2	(2)
3109-2002	Traffic and City Plan	2	(3)
3109-2003	Property Estimation	2	(2)
3109-2004	Practical Astronomy	3	(4)
3109-2005	Advanced Surveying	3	(4)
3109-2006	Surveying Instruments	2	(2)
3109-2007	Electronic Instrument Aided Surveying	3	(4)
3109-2008	Construction Surveying	3	(4)
3109-2009	Route -Surveying	3	(4)
3109-2010	Photogrammetry	3	(4)
3109-2011	Computer Aided Surveying	3	(4)
3109-2012	Survey Plan Reading	2	(3)

2.3 Specialized Vocational Courses (not less than)17 credits

Code	Course Title	Cr	(Hr)
3109-2101	Highway Engineering	2	(2)
3109-2102	Estate Business Management	2	(2)
3109-2103	Geographic Information System	3	(3)
3109-2104	Satellite System Aided Surveying	2	(3)
3109-2105	Mine Surveying and Geology	2	(2)
3109-2106	Landscape Map Drawing Practice	3	(6)
3109-2107	Route Surveying Practice	3	(6)
3109-2108	Irrigational Surveying	3	(6)
3109-2109	Construction Surveying Practice	3	(6)
3109-2110	City Plan Practice	3	(6)
3109-2111	Land Surveying	3	(6)
3106-2005	Construction Drawing 1	3	(6)
3106-2006	Construction Estimating 1	2	(3)
3121-2001	Materials Testing	2	(3)
3121-2002	Theory of Structures	3	(3)
3121-2003	Concrete Technology	2	(3)
3121-2004	Soil Mechanics	3	(4)
3121-2009	Reinforced Concrete Design	3	(3)
3121-2010	Timber and Steel Design	3	(3)
3121-2013	Hydraulics	3	(4)
3109-4101	Surveying Apprenticeship 1	5	(*)
3109-4102	Surveying Apprenticeship 2	5	(*)
3109-4103	Surveying Apprenticeship 3	4	(*)
3109-4104	Surveying Apprenticeship 4	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)
3109-6001	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.

Mechanical Drafting Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Mechanical Drafting Technology
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 Mechanical Drafting Technology. 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 Mechanical Drafting Technology.
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 Mechanical Drafting Work .
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 Mechanical Drafting Technology.

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. Design, draw, and develop machines
7. Design, draw, and develop machines tools
8. Design, draw, and develop products

Production Design and Drawing Specialization

9. Design and draw building and structural drawing
10. Design and draw plant electrical drawing
11. Design and draw industrial duct and piping drawing
12. Design, draw, and layout plant

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: Mechanical Drafting Technology

For the fulfillment of the courses, graduates should have completed at least 89 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)		**59**	**credits**
2.1 Basic Vocational Courses	**15**	**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)		**6**	**credits**
4. On-the-job Training (not less than 1 Semester)			
5. Extracurricular Activities 120 Hours			
Total (not less than)		**89**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Mechanical Drawing Stream or Mechanical Drawing 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	Technical Materials	2	(2)
3100-0005	Precision Measurements	2	(3)
3102-0002	Basic Machine Tools	3	(5)
3110-0001	Mechanical Drawing	2	(4)
3110-0002	Mechanical Drawing by CAD	2	(4)
	Total	**16**	**(28)**

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) 59 credits

2.1 Basic Vocational Courses 15 credits

Students must take the compulsory courses (3100-0101, 3100-0103, 3100-0118) 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	3	(3)
3100-0103	Fluid Mechanics	3	(3)
3100-0118	Machine Design	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 appendi**x.**

2.2 Core Vocational Courses 22 credits

Students must take 6 compulsory courses and select courses from the remainder to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3100-0106	Pneumatics and Hydraulics	3	(4)
3110-2001	Mechanical Design and Drawing by CAD	3	(4)
3110-2002	Material Handling System Design and Drawing by CAD	3	(4)
3110-2003	Plant Layout by Design and Drawing CAD	3	(4)
3110-2004	Mold Design and Drawing by CAD	3	(4)
3110-2005	Plumbing and Sanitary System Design and Drawing by CAD	3	(4)
3110-2006	Computer-aided Design and Drawing 1	3	(4)
3110-2007	Computer aided Design and Drawing 2	3	(4)
3110-2008	Computer aided Design and Drawing 3	3	(4)

3110-2009	Industrial Duct and Piping System Design and Drawing by CAD	3	(4)
3110-2010	Building and Construction Design and Drawing by CAD	3	(4)
3110-2011	Blueprint and Estimation	2	(2)
3110-2012	Principles of Design	2	(2)
3110-2013	Advanced Dimensioning	2	(2)

2.3 Specialized Vocational Courses (not less than) 15 credits

Students must take at least 15 credits from the Specialized Vocational Courses. These can be taken from one field of specialization.

1. Production Design and Drawing Specialization

Code	Course Title	Cr	(Hr)
3110-2101	CAD/CAM Technology	2	(4)
3110-2102	Power Transmission System Design and Drawing by CAD	3	(4)
3110-2103	Structural Design and Drawing by CAD	3	(4)
3110-2104	Product Design and Drawing by CAD	3	(4)
3110-2105	Electrical CAD	3	(4)
3110-2106	Punch and Die Design and Drawing by CAD	3	(4)
3110-2107	Jigs and Fixtures Design and Drawing by CAD	3	(4)
3110-4101	Machine Tools Design and Drawing Apprenticeship 1	4	(*)
3110-4102	Machine Tools Design and Drawing Apprenticeship 2	4	(*)
3110-4103	Machine Tools Design and Drawing Apprenticeship 3	4	(*)
3110-4104	Machine Tools Design and Drawing Apprenticeship 4	4	(*)

2. 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)
3110-6001	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.

Industrial Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study: Industrial Trades
Program : Industrial Technology
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 Industrial Technology. 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 Industrial Technology.
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 Industrial Technology Work.
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 Industrial Technology.

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 mechanical work
7. Control industrial machines by fluid and electricity
8. Control quality of industrial production

Installation and Maintenance Specialization

9. Plan the process of plant maintenance
10. Inspect, maintain and repair machines
11. Layout plant and install machines

Industrial Production Techniques Specialization

9. Control Quality in production
10. Develope production process and productivity
11. Manage industrial work

Industrial Rubber and Plastics Specialization

9. Test property of rubber and chemicals for rubber.
10. Test property of compound rubber
11. Make rubber and plastic product
12. Test standard of rubber and plastic product

Footwear Industry Specialization

9. Plan and develop industrial footwear system
10. Control and check production of footwear industry
11. Inspect standard of footwear production

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 : Industrial Technology

For the fulfillment of the program, graduates should have completed at least 93 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)		**63**	**credits**
2.1 Basic Vocational Courses	**14 credits**		
2.2 Core Vocational Courses	**23 credits**		
2.3 Specialized Vocational Courses (not less than)	**22 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)		**93**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Industrial Trades 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	Technical Materials	2	(2)
3100-0005	Precision Measurements	2	(3)
3101-0003	Gasoline Engine	3	(5)
3102-0002	Basic Machine Tools	3	(5)
3111-0001	Basic Maintenance	2	(4)
	Total	**19**	**(32)**

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) 62 credits

2.1 Basic Vocational Courses 14 credits

Students must take the compulsory courses (3100-0101, 3100-0107, 3100-0158) 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	3	(3)
3100-0107	Strength of Materials	3	(3)
3100-0158	Safety Management	2	(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 appendi**x.**

2.2 Core Vocational Courses 23 credits

Code	Course Title	Cr	(Hr)
3100-0106	Pneumatics and Hydraulics	3	(4)
3100-0112	Industrial Materials	2	(3)
3100-0115	Manufacturing Processes	2	(2)
3100-0117	Engineering Metrology	2	(3)
3100-0150	Quality Control	3	(3)
3100-0152	Industrial Management	3	(3)
3111-2001	Industrial Electricity	2	(3)
3111-2002	Mechanical drawing	2	(3)
3111-2003	Machine Tool Technology	3	(5)
3111-2004	Plant Layout	2	(3)

2.3 Specialized Vocational Courses (not less than) 22 credits

Students must take at least 22 credits from the Specialized Vocational Courses. These can be taken from one field of specialization or across different fields of specialization**.**

1. Installation and Maintenance Specialization

Code	Course Title	Cr	(Hr)
3100-0108	Machine Elements	3	(3)
3100-0113	Metallurgy	3	(3)
3100-0114	Materials Testing	2	(3)
3100-0116	Material Handling	2	(2)
3111-2101	Maintenance Management	2	(2)
3111-2102	Maintenance	3	(5)
3111-2103	Machine Maintenance	3	(6)
3111-2104	Power Plant	2	(3)
3111-2105	Plant Layout and Installation	3	(6)
3111-2106	Pump and Piping Systems	2	(2)
3111-2107	Pump and Piping Practice	3	(6)
3111-2108	Refrigeration and Air Conditioning	2	(2)
3111-2109	Refrigeration and Air Conditioning work	3	(6)
3111-2201	CNC Technology	2	(3)
3111-2202	Jig and Fixture Design	2	(2)
3111-2203	Machine Tool Practice	3	(6)
3111-4101	Installation and Maintenance Apprenticeship 1	6	(*)
3111-4102	Installation and Maintenance Apprenticeship 2	6	(*)
3111-4103	Installation and Maintenance Apprenticeship 3	5	(*)
3111-4104	Installation and Maintenance Apprenticeship 4	5	(*)

2. Industrial Production Techniques Specialization

Code	Course Title	Cr	(Hr)
3100-0103	Fluid Mechanics	3	(3)
3100-0108	Machine Elements	3	(3)
3100-0111	Thermodynamics	3	(3)
3100-0113	Metallurgy	3	(3)
3100-0114	Materials Testing	2	(3)
3100-0116	Material Handling	2	(2)
3100-0154	Work Study	2	(2)
3111-2101	Maintenance Management	2	(2)
3111-2102	Maintenance	3	(5)
3111-2105	Plant Layout and Installation	3	(6)
3111-2201	CNC Technology	2	(3)
3111-2202	Jig and Fixture Design	2	(2)
3111-2203	Machine Tool Practice	3	(6)
3111-2204	Machine Tool Production	3	(6)
3111-2205	Welding	2	(4)
3111-2206	Power Plant work	3	(6)
3111-2207	Production Process	3	(3)
3111-4201	Industrial Production Apprenticeship 1	6	(*)
3111-4202	Industrial Production Apprenticeship 2	6	(*)

3111-4203	Industrial Production Apprenticeship 3	5	(*)
3111-4204	Industrial Production Apprenticeship 4	5	(*)

3. Industrial Rubber and Plastics Specialization

Code	Course Title	Cr	(Hr)
3111-2301	Natural Rubber	2	(2)
3111-2302	Synthetic Rubber	2	(2)
3111-2303	Rubber Products	3	(5)
3111-2304	Latex Products	3	(5)
3111-2305	General Plastics	3	(5)
3111-2306	Rubber and Plastic Plant Layout	3	(3)
3111-2307	Rubber and Plastic Machine Maintenance	2	(3)
3111-2308	Rubber Formulation	2	(2)
3111-2309	Analytical Chemistry	3	(5)
3111-2310	Rubber Testing-Instruments	2	(3)
3111-2311	Chemicals for Rubber Industry	2	(3)
3111-2312	Plastic Technology	2	(2)
3111-2313	Manufacturing of raw rubber	3	(5)
3111-2314	Rubber Products 1	3	(5)
3111-2315	Rubber Products 2	3	(5)
3111-2316	Latex Products 1	3	(5)
3111-2317	Latex Products 2	3	(5)
3111-4301	Rubber and Plastic Industrial Apprenticeship 1	6	(*)
3111-4302	Rubber and Plastic Industrial Apprenticeship 2	6	(*)
3111-4303	Rubber and Plastic Industrial Apprenticeship 3	5	(*)
3111-4304	Rubber and Plastic Industrial Apprenticeship 4	5	(*)

4. Footwear Industry Specialization

Code	Course Title	Cr	(Hr)
3111-2201	CNC Technology	2	(3)
3111-2401	Industrial Footwear Machine	2	(3)
3111-2402	Footwear Production Technology	3	(3)
3111-2403	Industrial Footwear Production	3	(3)
3111-2404	Footwear Production Raw Material	2	(2)
3111-2405	Industrial Chemistry	3	(3)
3111-2406	Polymer Chemistry	2	(2)
3111-2407	Production Preparation 1	2	(2)
3111-2408	Production Preparation 2	2	(2)
3111-2409	Shoes and Accessory	3	(6)
3111-2410	Footwear structure and design	3	(6)
3111-2411	Leather and Tanning Process	3	(6)
3111-2412	Footwear mold Technique	3	(6)
3111-2413	Special Problem in Footwear Industry	2	(2)
3100-0155	Industrial Psychology	2	(2)
3100-0156	Industrial Business	2	(2)
3111-4401	Footwear Industrial Apprenticeship 1	6	(*)
3111-4402	Footwear Industrial Apprenticeship 2	6	(*)
3111-4403	Footwear Industrial Apprenticeship 3	5	(*)
3111-4404	Footwear Industrial Apprenticeship 4	5	(*)

5. 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)
3111-6001	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.

Printing Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Printing Technology
Objectives

The program aims at providing students with knowledge, skills, abilities, attitudes and experience which will enable them to perform as skilled technicians in the field of Printing Technology. 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 Printing Technology.
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 printing work.
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 Printing Technology.

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 a technicians.
6. Plan and design graphic printing products
7. Operate and control the printing
8. Plan printing production
9. Design graphic printing
10. Print by letterpress process
11. Print by offset lihography
12. Print by screening process
13. Print by flexography process
14. Print by Gravure process
15. Arrange binding and finishing operations
16. Organize packaging for the printing product

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study: Industrial Trades
Program: Printing Technology

For the fulfillment of the courses, graduates should have completed at least 92 credits from the 5 groups of courses below.

1. General Courses (not less than)		**21**	**credits**
1.1 Basic General Courses	**13 credits**		
1.2 Vocational-based General Courses (not less than)	**8 credits**		
2. Vocational Courses (not less than)		**65**	**credits**
2.1 Basic Vocational Courses	**15 credits**		
2.2 Core Vocational Courses	**24 credits**		
2.3 Specialized Vocational Courses (not less than)	**22 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)		**92**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Printing 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)
3112-0001	Basic Printing	2	(3)
3112-0002	Printing Materials	2	(3)
3112-0003	Offset Printing	3	(6)
	Total	**7**	**(12)**

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) 8 credits

Code	Course Title	Cr	(Hr)
3000-120X	English (Elective)	1	(2)
3000-120X	English (Elective)	1	(2)
3000-142X	Science (Elective)	3	(4)
3000-1521	Mathematics 2	3	(3)

2. Vocational Courses (not less than) 65 credits

2.1 Basic Vocational Courses 15 credits

Students must take the compulsory courses (3112-1001 to -1003) and select one course from 3000-100X and one from 3000-020X to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3112-1001	Printing Technology	3	(4)
3112-1002	Printing Materials	3	(4)
3112-1003	Basic Color Image Technology	3	(4)
3000-100X	Quality Management (Elective)	3	(3)
3000-020X	Computer Technology (Elective)	3	(4)

Remarks : The code with X will be chosen from the appendi**x.**

2.2 Core Vocational Courses 24 credits

Code	Course Title	Cr	(Hr)
3112-2001	Printing Administration	2	(3)
3112-2002	Graphic Design in Printing	2	(3)
3112-2003	Page Composition and Assembly	2	(3)
3112-2004	Basic Graphics Production	2	(3)
3112-2005	Film Image Production	2	(3)
3112-2006	Basic Color Separation	2	(3)
3112-2007	Basic Platemaking and Image carrier	2	(3)
3112-2008	Offset Lithography Printing 1	3	(4)
3112-2009	Screen Printing 1	2	(3)
3112-2010	Book Binding	2	(3)
3112-2011	Printing Quality Control	3	(4)

2.3 Specialized Vocational Courses (not less than) 18 credits

Code	Course Title	Cr	(Hr)
3112-2101	Page Composition and Assembly Techniques	2	(3)
3112-2102	Advanced Graphics production	2	(3)
3112-2103	Package Design Production	2	(3)
3112-2104	Color Management System	2	(3)
3112-2105	Color Separation Techniques	2	(3)
3112-2106	Film Image Production Techniques	2	(3)
3112-2107	Planographic Platemaking	2	(3)
3112-2108	Relief Platemaking	2	(3)
3112-2109	Engraving Platemaking	2	(3)
3112-2111	Stencil Platemaking	2	(3)
3112-2112	Color Proofing Techniques	3	(4)
3112-2113	Pre- press Quality Control	3	(3)
3112-2114	Pre-press Process Theory	3	(4)
3112-2115	Pre-press Production Techniques	2	(2)
3112-2116	Printing Estimates	2	(2)
3112-2117	Paper and Printing Ink	2	(3)
3112-2118	Photography Chemistry	2	(3)
3112-2119	Offset Lithography Printing 2	3	(4)
3112-2120	Offset Lithography Printing 3	3	(4)
3112-2121	Web-offset Printing 1	3	(4)
3112-2122	Web-offset Printing 2	3	(4)
3112-2123	Letterpress Printing 1	3	(4)
3112-2124	Letterpress Printing 2	3	(4)
3112-2125	Flexography Printing 1	3	(4)
3112-2126	Flexography Printing 2	3	(4)
3112-2127	Gravure Printing 1	3	(4)
3112-2128	Gravure Printing 2	3	(4)
3112-2129	Screen Printing 2	2	(3)
3112-2130	Non- Impact Printing	2	(3)
3112-2131	Pad System Printing	2	(3)
3112-2132	Printing Production Techniques	3	(4)
3112-2133	Printing Planning and Control	2	(3)
3112-2134	Printing Machine Maintenance	2	(3)
3112-2135	Printing Production Quality Control Techniques	3	(4)
3112-2136	Book-Binding Techniques	2	(3)
3112-2137	Postpress Process Techniques	2	(3)
3112-2138	Packaging and Packages	2	(3)
3112-2139	Postpress Quality Control	3	(4)
3112-2140	Postpress Process Theory	3	(3)
3112-2141	Postpress Production Techniques	3	(4)
3112-4101	Printing Apprenticeship 1	6	(*)
3112-4102	Printing Apprenticeship 2	6	(*)
3112-4103	Printing Apprenticeship 3	5	(*)
3112-4104	Printing Apprenticeship 4	5	(*)

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)**
3112-6001	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.

Optical and Lens Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study: Industrial Trades
Program : Optics and Lens Technology
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 Optics and Lens Technology. 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 Optics and Lens Technology.
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 optics and lens work.
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 Optics and Lens Techniology.

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. Check internal and external of the eye
7. Check the function of the extra area-ocular muscles
8. Check visual field
9. Check refractive error of the eyes with subjective method
10. Check refractive error of the eyes with objective method
11. Correct refractive error of the eyes with spectacles glasses
12. Correct refractive error of the eyes with contact lenses
13. Maintain visual instruments
14. Manage optical business

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Optics and Lens Technology

For the fulfillment of the program, graduates should have completed at least 89 credits from the 5 groups of courses below.

1. General Courses (not less than)		**21**	**credits**
1.1 Basic General Courses	**13 credits**		
1.2 Vocational-based General Courses (not less than)	**8 credits**		
2. Vocational Courses (not less than)		**62**	**credits**
2.1 Basic Vocational Courses	**12 credits**		
2.2 Core Vocational Courses	**23 credits**		
2.3 Specialized Vocational Courses (not less than)	**23 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)		**89**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Optics and Lens 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)
3116-0001	Ophthalmic Lenses	2	(4)
3116-0002	Frame Litting	2	(4)
3116-0003	Frame and Lenses Selection	2	(4)
3116-0004	Repair and Adjustment of Eyewear	2	(4)
	Total	**8**	**(16)**

1. General Courses (not less than) 21 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) 8 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)

2. Vocational Courses (not less than) 62 credits

2.1 Basic Vocational Courses 12 credits

Students must take the compulsory courses (3116-1001, 3116-1002, 3116-1003) and select one course from 3000-100X and one from 3000-020X to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3116-1001	Human Anatomy and Physiology	2	(3)
3116-1002	Microbiology	2	(3)
3116-1003	General Pathology	2	(2)
3000-100X	Quality Management (Elective)	3	(3)
3000-020X	Computer Technology (Elective)	3	(4)

Remarks : The code with X will be chosen from the appendi**x.**

2.2 Core Vocational Courses 23 credits

Students must take 9 compulsory courses and select courses from the remainder to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3116-2001	Ocular Anatomy	2	(3)
3116-2002	Ocular Physiology 1	2	(3)
3116-2003	Ocular Physiology 2	2	(3)
3116-2004	Optics 1	2	(3)
3116-2005	Optics 2	2	(3)
3116-2006	Binocular Vision and fusion	2	(3)
3116-2007	Basic sight examination	3	(4)
3116-2008	Ocular Pathology	3	(4)
3116-2009	Sight examination by Subjective method	3	(4)
3116-2010	Contact Lense	3	(4)
3116-2011	Visual Development	2	(2)
3116-2012	Visual Neurophysiology	2	(2)

2.3 Specialized Vocational Courses (not less than)23 credits

Code	Course Title	Cr	(Hr)
3116-2101	Ocular Disease	2	(2)
3116-2102	Ratinoscopy	3	(4)
3116-2103	Eye Examination Instruments	2	(3)
3116-2104	Hygiene and Public health	2	(2)
3116-2105	Visual Psychology	2	(2)
3116-2106	Optical Administration and Management	3	(4)
3116-2107	Optahalmoscopy	3	(4)
3116-2108	Visual Instrument	3	(4)
3116-2109	Optical shop Interior Decoration	3	(4)
3116-2110	Optic and Lense Advanced Technology	2	(2)
3116-4101	Optic and Lense Apprenticeship 1	6	(*)
3116-4102	Optic and Lense Apprenticeship 2	6	(*)
3116-4103	Optic and Lense Apprenticeship 3	6	(*)
3116-4104	Optic and Lense Apprenticeship 4	6	(*)

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)
3116-6001	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.

Ship Building Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Ship Building Technology
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 Ship Building Technology. 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 Ship Building Technology.
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 Ship Building work.
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 Ship Building Technology.

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. Analyze the operation of mechanical system
7. Analyze the motion of objects in fluid
8. Select materials according to their metallurgy characteristics
9. Design Ship
10. Produce detailed technical drawing of ship
11. Expand loft ship blueprint
12. Plan the process of ship construction
13 Manage the dock system
14. Oversee the material inventory for ship building

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Ship Building Technology

For the fulfillment of the program, graduates should have completed at least 91 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)		**61**	**credits**
2.1 Basic Vocational Courses	**15 credits**		
2.2 Core Vocational Courses	**25 credits**		
2.3 Specialized Vocational Courses (not less than)	**17 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)		**91**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Ship Building 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)
3100-0007	Welding and Sheet Metal	2	(4)
3106-0004	Woodworking Practice	2	(4)
3117-0001	Ship Fabrication	3	(6)
3117-0002	Ship Drawing	2	(4)
	Total	**16**	**(31)**

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) 615credits

2.1 Basic Vocational Courses 15 credits

Students must take the compulsory courses (3100-0103, 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)
3100-0103	Fluid Mechanics	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 appendi**x.**

2.2 Core Vocational Courses 25 credits

Students must take 9 compulsory courses and select courses from the remainder to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3117-2001	Naval Architecture	3	(3)
3117-2002	Strength of Ship	3	(3)
3117-2003	Ship-Drawing 1	2	(4)
3117-2004	Ship Lofting	2	(4)
3117-2005	Planning and Control Ship building	2	(2)
3117-2006	Estimation	2	(3)
3117-2007	Computer Aid Design for Ship building	3	(4)
3117-2008	Ship-Building Industrial Management	2	(2)
3117-2009	Marine Structures Engineering	3	(3)
3117-2010	Ship Motion and Vibration	3	(3)
3117-2011	Ship Resistance and Propulsion	3	(3)

2.3 Specialized Vocational Courses (not less than)17 credits

Code	Course Title	Cr	(Hr)
3117-2101	Jig and Fixture Design for Ship Building	2	(2)
3117-2102	Marine Structure	3	(6)
3117-2103	Wooden Boat Building	3	(6)
3117-2104	Metal Ship Building	3	(6)
3117-2105	Fiberglass Boat Building	3	(6)
3117-2106	Ship Maintenance	3	(6)
3117-2107	Planking and Painting	2	(4)
3117-2108	Ship Interior Decoration	2	(4)
3117-2109	Piping System in Ship	2	(4)
3117-2110	Ship Drawing 2	2	(4)
3117-2111	Ship Model Building	3	(6)
3117-2112	Material Handing in Ship	2	(2)
3117-2113	Electrical Machinery Control	2	(3)
3117-2114	Ship Building Machinery	2	(2)
3117-2115	Ship Mapping and Compass Usage	2	(2)
3117-2116	Aluminum Boat Building	3	(6)
3117-2117	Marine Engine Installation	2	(4)
3117-2118	Electrical System in Ship	2	(4)
3117-2119	Communication System in Ship	2	(2)
3117-2120	Electronics System in Ship	2	(2)
3117-2121	International Navigation Law	2	(2)
3117-2122	Thai Water front Navigation	2	(2)
3117-2123	Ship Building and Marine Structures Law	2	(2)
3117-2124	Ship Structure	2	(4)
3117-2125	Ship Fabrication	3	(5)
3117-2126	Propeller and Steer	2	(3)
3117-4101	Ship-Building Apprenticeship 1	5	(*)
3117-4102	Ship-Building Apprenticeship 2	5	(*)
3117-4103	Ship-Building Apprenticeship 3	4	(*)
3117-4104	Ship-Building Apprenticeship 4	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)
3117-6001	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.

Metal Foundry Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study: Industrial Trades
Program : Metal Foundry Technology
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 Foundry Technology. 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 Foundry Technology.
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 FoundryWork.
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 Foundry Technology.

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 draw pattern drawings
7. Design pattern drawings
8. Estimate metal foundry price
9. Make patterns
10. Make molds
11. Control furnace
12. Control metal melting and pouring
13. Maintain metal foundry equipment
14. Test and check metal foundry work
15. Solve a defect of metal foundry work

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

For the fulfillment of the program, graduates should have completed at least 91 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)		**61**	**credits**
2.1 Basic Vocational Courses	**14**	**credits**	
2.2 Core Vocational Courses	**26**	**credits**	
2.3 Specialized Vocational Courses (not less than)	**17**	**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)		**91**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Metal Foundry 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	Technical Materials	2	(2)
3100-0006	General Machine Elements	2	(3)
3100-0007	Welding and Sheet Metal	2	(4)
3102-0002	Basic Machine Tools	3	(5)
3118-0001	Machine - Drawing	2	(4)
	Total	**18**	**(31)**

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) 63 credits

2.1 Basic Vocational Courses 14 credits

Students must take the compulsory courses (3100-0101, 3100-0107, 3100-0151) 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	3	(3)
3100-0107	Strength of Materials	3	(3)
3100-0151	Safety and Pollution Control	2	(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 appendi**x.**

2.2 Core Vocational Courses 26 credits

Students must take 11 compulsory courses (3118-2001 to 2007, 3100-0112,0113,0115,0117) and select courses from the remainder to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3118-2001	Pattern - Reading and Drawing	2	(4)
3118-2002	Casting - Process 1	2	(2)
3118-2003	Sand - Casting Analysis	2	(4)
3118-2004	Metallurgy Casting	3	(2)
3118-2005	Metal Casting Design	2	(2)
3118-2006	Casting - Test and Inspection	2	(4)
3118-2007	Casting process	2	(2)
3100-0112	Industrial Materials	2	(3)
3100-0113	Metallurgy	3	(3)
3100-0115	Manufacturing Processes	2	(2)
3100-0117	Engineering Metrology	2	(3)

3100-0150	Quality Control	3	(3)
3103-2001	Welding Technology I	2	(4)

2.3 Specialized Vocational Courses (not less than) 17 credits

Code	Course Title	Cr	(Hr)
3118-2101	Pattern Work	3	(6)
3118-2102	Casting 1	3	(6)
3118-2103	Casting 2	3	(6)
3118-2104	Casting 3	3	(6)
3118-2105	Maintenance	2	(4)
3118-2106	Industrial Electricity	2	(4)
3102-2102	Machine Tools 1	3	(5)
3102-2103	Machine Tools 2	3	(5)
3103-2104	Surface finishing	2	(4)
3100-0106	Pneumatics and Hydraulics	3	(4)
3118-4101	Casting Apprenticeship 1	5	(*)
3118-4102	Casting Apprenticeship 2	5	(*)
3118-4103	Casting Apprenticeship 3	4	(*)
3118-4104	Casting Apprenticeship 4	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)
3118-6001	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.

Telecommunication Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study: Industrial Trades
Program: Telecommunication Technology
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 Telecommunication Technology. 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 Telecommunication Technology.
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 telecommunication work.
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 Telecommunication Technology.

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 telecommunication technology work
7. Select appropriate materials, equipment and techniques for telecommunication work
8. Plan; control and develop telecommunication work
9. Maintain, check and repair the telecommunication system

Telephone Systems Specialization

10. Interpret and design drawings of telephone systems
11. Select appropriate materials, devices and techniques for telephone system
12. Plan, control, install and test telephone systems
13. Maintain, check, repair and solve the problems of telephone systems

Outside Plant Systems Specialization

10. Interpret and design drawings of outside plant systems
11. Select appropriate materials, devices and techniques for the outside plant systems
12. Plan, control , install and test outside plant systems
13. Maintain, check, repair and solve the problems of outside plant systems

Data Communication & Network Systems Specialization

10. Interpret and Draw data communication & network systems
11. Select appropriate materials, devices and techniques for data communication & network systems
12. Plan, control , install and test data communication & network systems
13. Maintain, check, repair and solve the problems of data communication & network systems

Radio Communication Systems Specialization

10. Interpret and design drawing of radio communication systems
11. Select appropriate materials, devices and techniques for radio communication systems
12. Plan, control , install and test radio communication systems
13. Maintain, check, repair and solve the problems of radio communication systems

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study: Industrial Trades
Program: Telecommunication Technology

For the fulfillment of the program, graduates should have completed at least 92 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)		**62**	**credits**
2.1 Basic Vocational Courses	**14**	**credits**	
2.2 Core Vocational Courses	**28**	**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)		**92**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Electrical Power Program or Electronic Program, Telecommunication Program, Electronic and Telecommunication Specialization 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	Electricity and Electronics Theory	2	(4)
3104-0001	Basic Electricity Theory and measurements	3	(4)
3104-0002	Electronic Drawing	2	(3)
3104-0003	Basic Electronic Circuits	2	(3)
3104-0004	Basic Pulse and Digital	2	(3)
3104-0005	Basic Audio and Video System	3	(4)
	Total	**19**	**(30)**

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) 62 credits

2.1 Basic Vocational Courses 14 credits

Students must take the compulsory courses (3119-1001 - 3119-1003) and select one course from 3000-100X and one from 3000-020X to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3119-1001	Electric Circuit Analysis	3	(4)
3119-1002	Electrical and Electronic Instruments	2	(3)
3119-1003	Electronic Circuit Analysis	3	(4)
3000-010X	Quality Management (Elective)	3	(3)
3000-020X	Computer Technology (Elective)	3	(4)

Remarks : The code with X will be chosen from the appendi**x.**

2.2 Core Vocational Courses 28 credits

Students must take 1-9 compulsory courses (3119-2001 to -2009) and select courses from the remainder to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3119-2001	Digital and Microprocessors	3	(4)
3119-2002	High Frequency Electronic Circuit Analysis	2	(3)
3119-2003	Satellite Communication	2	(3)
3119-2004	Microwave Technology	2	(3)
3119-2005	Telephone Systems	3	(4)
3119-2006	Fiber Optic Transmission Systems	3	(4)
3119-2007	Radio Communication Systems	2	(3)
3119-2008	Telecommunication Transmission Line and Antenna	2	(3)
3119-2009	Telecommunication Concept	2	(3)
3119-2010	Data Communications	3	(4)
3119-2011	Computer Network Systems	2	(3)
3119-2012	Mobile Telephone Systems	2	(3)

3119-2013	Computer Hardwares	3	(4)
3119-2014	Radio Communication Instruments	2	(3)
3119-2015	Integrated Service Digital Network (ISDN)	2	(3)
3119-2016	Submarine Cable Technology	2	(3)
3119-2017	Pulse Techniques	2	(3)
3119-2018	Special Problem in Telecommunications	2	(4)
3119-2019	High Definitions Television Systems (HDTV. System)	2	(3)
3105-2020	Electromagnetic Field Fundamental	3	(3)

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 or across different fields of specialization**.**

1. Telephone System Specialization

Code	Course Title	Cr	(Hr)
3119-2101	SPC. Telephone Exchange Fundamentals	3	(4)
3119-2102	PABX Telephone Systems	2	(3)
3119-2103	Telephone Exchange Maintenance	3	(4)
3119-2104	Telephone Traffic Techniques	2	(3)
3119-2105	Power Plant of Telephone Exchange	2	(3)
3119-2106	Telephone Signaling Systems	3	(4)
3119-2107	Public Telephone Systems	3	(4)
3119-2108	Advanced Topic in Telephone Systems	2	(3)
3119-4101	Telephone Systems Apprenticeship 1	4	(*)
3119-4102	Telephone Systems Apprenticeship 2	4	(*)
3119-4103	Telephone Systems Apprenticeship 3	4	(*)
3119-4104	Telephone Systems Apprenticeship 4	4	(*)

2. Outside Plant Systems Specialization

Code	Course Title	Cr	(Hr)
3119-2201	Outside Plant Systems	3	(4)
3119-2202	Fiber Optic Cable Fundamentals	3	(4)
3119-2203	Telephone Network Survey and Design	2	(3)
3119-2204	Telephone Cable Installation	3	(4)
3119-2205	Cable Splicing	2	(3)
3119-2206	Telephone Network Maintenance	2	(3)
3119-2207	Outside Plant Drawing and Reading	3	(4)
3119-2208	Advanced Topic in Outside Plant System	2	(3)
3119-4101	Outside Plant System Apprenticeship 1	4	(*)
3119-4102	Outside Plant System Apprenticeship 2	4	(*)
3119-4103	Outside Plant System Apprenticeship 3	4	(*)
3119-4104	Outside Plant System Apprenticeship 4	4	(*)

3. Data Communication & Network Systems Specialization

Code	Course Title	Cr	(Hr)
3119-2301	Digital Multiplexing Systems	3	(4)
3119-2302	Digital Communication Technology	2	(3)
3119-2303	Data Communication Network Maintenance	2	(3)
3119-2304	Data Communication Network Instruments	2	(3)

3119-2305	Advanced Topics in Data Communication Network	2	(3)
3119-2306	Internet Systems	2	(3)
3119-4301	Data Communication Network Apprenticeship 1	4	(*)
3119-4302	Data Communication Network Apprenticeship 2	4	(*)
3119-4303	Data Communication Network Apprenticeship 3	4	(*)
3119-4304	Data Communication Network Apprenticeship 4	4	(*)

4. Radio Communication Systems Specialization

Code	**Course Title**	**Cr**	**(Hr)**
3119-2401	Television and Radio Broadcasting Systems	3	(4)
3119-2402	Close Circuit Television Systems	2	(3)
3119-2403	Radio Communication Transceiver Systems	2	(3)
3119-2404	Distal Microwave System Maintenance	2	(3)
3119-2405	GPS Satellite Systems	2	(3)
3119-2406	MATV. and CATV. Systems	3	(4)
3119-2407	Studio and Producing Program Systems	3	(4)
3119-2408	Advanced Topic in Radio Communication Systems	2	(3)
3119-4401	Radio Communication Apprenticeship 1	4	(*)
3119-4402	Radio Communication Apprenticeship 2	4	(*)
3119-4403	Radio Communication Apprenticeship 3	4	(*)
3119-4404	Radio Communication Apprenticeship 4	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)**
3119-6001	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.

Industrial Instrumentation

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

The program aims at providing students with knowledge, skills, abilities, attitudes and experience which will enable them to perform as skilled technicians in the field of Industrial Instrumentation. 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 Industrial Instrumentation.
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 industrial instrumentation work.
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 Industrial Instrumentation.

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. Design and interpret drawings of instrumentation work; install and maintain the instrumentation equipment; and control in industrial work process
7. Install, adjust and maintain instrumentation equipment.
8. Calibrate the rang of instrumentation equipment

Instrumentation and control Technology Specialization

9. Analyze and calibrate the instrumentation equipment
10. Design electrical, electronic and computer control system in instrumentation work.

Petroleum Technology Specialization

9. Test machines and communication equipment system.
10. Control process of petroleum work system

Gas Technology Specialization

9. Design and install gas supply system.
10. Analyze gas separation process.

Metrology Specialization

9. Calibrate, adjust and maintain instrumentation equipment
10. Calibrate, adjust and maintain dimension and mechanical devices.
11. Calibrate, adjust and maintain electrical, temperature and chemical equipment.

Environment Technology 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: Industrial Instrumentation

For the fulfillment of the courses, graduates should have completed at least 89 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)		**59**	**credits**
2.1 Basic Vocational Courses	**14**	**credits**	
2.2 Core Vocational Courses	**25**	**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)		**89**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Electrical and Electronic 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)
3104-0002	Electrical Instruments and Circuit	3	(5)
3105-0003	Basic Electronics Circuit	2	(3)
3105-0004	Basic Digital and Pulse Circuit	2	(3)
	Total	**14**	**(24)**

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) 59 credits**

2.1 Basic Vocational Courses **14 credits**

Students must take the compulsory courses (3120-1001 - 3120-1003) and select one course from 3000-100X and one from 3000-020X to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3120-1001	Electrical Instrument and Measurement	3	(4)
3120-1002	Electric Circuits	3	(4)
3120-1003	Basic Industrial Instrument Works	2	(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 appendi**x.**

2.2 Core Vocational Courses **25 credits**

Code	Course Title	Cr	(Hr)
3120-2001	Digital Technology	3	(4)
3120-2002	Microprocessor Technology	3	(4)
3120-2003	Industrial Control Electronic	3	(4)
3120-2004	Thermodynamic and Fluids Mechanics	3	(3)
3120-2005	Automation Control	3	(4)
3120-2006	Sensor and Transducer	3	(4)
3120-2007	Industrial Instruments	4	(6)
3120-2008	Process Controller	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. Instrumentation and control Technology Specialization

Code	Course Title	Cr	(Hr)
3120-2101	Programmable Logic Controller and control	3	(4)
3120-2102	Computer and Control	3	(4)
3120-2103	Instrument and control Devices	2	(3)
3120-2104	Instrument and control Procedure	2	(2)
3120-2105	Industrial Instrument Calibration	2	(3)
3120-2106	Electrical Machinery and Control	3	(4)
3100-0106	Pneumatics and Hydraulics	3	(4)
3120-4101	Instrumentation Apprenticeship 1	4	(*)
3120-4102	Instrumentation apprenticeship 2	4	(*)
3120-4103	Instrumentation Apprenticeship 3	4	(*)
3120-4104	Instrumentation Apprenticeship 4	4	(*)

2. Petroleum Technology Specialization

Code	Course Title	Cr	(Hr)
3120-2201	Chemical Petroleum Structure	2	(3)
3120-2202	Fundamental Petroleum Technology	2	(3)
3120-2203	Petroleum Product	2	(3)
3120-2204	Introduction to Inspection and corrosion	2	(3)
3120-2205	Electrical System in Petroleum Plant	2	(3)
3120-2206	Static Equipment 1	2	(3)
3120-2207	Static Equipment 2	2	(3)
3120-2208	Prime mover 1	2	(4)
3120-2209	Pump and Compressor	2	(4)
3120-2210	Introduction to Telecommunication Network System	2	(3)
3120-2211	Petroleum Data	2	(3)
3120-2212	Safety Industrial Petroleum	2	(3)
3120-2101	Programmable Logic Controller and control	3	(4)
3120-2105	Industrial Instrument Calibration	2	(3)
3100-0106	Pneumatics and Hydraulics	3	(4)
3120-4201	Petroleum Technology Apprenticeship 1	4	(*)
3120-4202	Petroleum Technology Apprenticeship 2	4	(*)
3120-4203	Petroleum Technology Apprenticeship 3	4	(*)
3120-4204	Petroleum Technology Apprenticeship 4	4	(*)

3. Gas Technology Specialization

Code	Course Title	Cr	(Hr)
3120-2301	Gas Pipe Drawing and Design	3	(4)
3120-2302	Gas Pipe Drawing and Design	3	(4)
3120-2303	Combustion and Control Efficiency	3	(4)
3120-2304	Combustion and Control Efficiency	2	(3)
3120-2305	Gas Technology 1	2	(3)
3120-2306	Gas Technology 2	3	(4)
3120-2203	Petroleum Product	2	(3)
3120-2209	Pump and Compressor	2	(4)
3120-4301	Gas Technology Apprenticeship 1	4	(*)
3120-4302	Gas Technology Apprenticeship 2	4	(*)
3120-4303	Gas Technology Apprenticeship 3	4	(*)
3120-4304	Gas Technology Apprenticeship 4	4	(*)

4. Metrology Specialization

Code	Course Title	Cr	(Hr)
3120-2401	Fundamental Metrology	3	(4)
3120-2402	Dimension Metrology	3	(4)
3120-2403	Mechanical Metrology	3	(5)
3120-2404	Electrical Metrology	3	(5)
3120-2505	Temperature Metrology	2	(3)
3120-2606	Chemical Metrology	2	(3)
3120-4401	Metrology Apprenticeship 1	4	(*)
3120-4401	Metrology Apprenticeship 2	4	(*)
3120-4403	Metrology Apprenticeship 3	4	(*)
3120-4404	Metrology Apprenticeship 4	4	(*)

5. Environment Technology Specialization

Code	Course Title	Cr	(Hr)
3120-0221	Basic Chemistry Environment	2	(3)
3120-0222	Basic Micro Biological Environment	2	(3)
3120-0223	Basic Temperature and Fluids mechanics	3	(3)
3120-0224	Waste water Treatment and Control Technique	3	(5)
3120-0225	Air Pollution Control Technique	2	(3)
3120-0226	Sound and Vibration Control Technique	2	(3)
3100-0227	Hazardous Waste and Management Technique	2	(4)
3100-0228	Clean Technology for Technician	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)
3120-6001	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.

Civil Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Civil Technology
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 Civil Technology. 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 Civil Technology.
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 civil work.
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 Civil Technology.

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. Conduct survey in engineering works
7. Calculate and design building structures
8. Design civil and construction drawings
9. Survey work quantity and estimate the cost
10. Mange, plan and control civil works
11. Test civil engineering materials

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Civil Technology

For the fulfillment of the program, graduates should have completed at least 92 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)		**62**	**credits**
2.1 Basic Vocational Courses	**12**	**credits**	
2.2 Core Vocational Courses	**31**	**credits**	
2.3 Specialized Vocational Courses (not less than)	**15**	**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)		**92**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Building Construction Program, Building Construction Specialization, Civil Construction Specialization and Surveying Specialization 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)
3106-0001	Structural Mechanics	2	(2)
3106-0002	Construction Materials	2	(2)
3106-0003	Construction Techniques	2	(2)
3106-0005	Construction Workshop	2	(4)
3106-0006	Construction Estimating	2	(3)
3106-0007	Construction Drawing	2	(4)
3106-0008	Surveying	2	(3)
	Total	**14**	**(20)**

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) 62 credits

2.1 Basic Vocational Courses 12 credits

Students must take the compulsory courses (3100-0101, 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	3	(3)
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 appendi**x**

2.2 Core Vocational Courses 31 credits

Students must take 11 compulsory courses and select courses from the remainder to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3121-2001	Materials Testing	2	(3)
3121-2002	Theory of Structures	3	(3)
3121-2003	Concrete Technology	2	(3)
3121-2004	Soil Mechanics	3	(4)
3121-2005	Route Surveying	3	(4)
3121-2006	Highway Engineering	3	(3)
3121-2007	Civil Construction Techniques	3	(3)
3121-2008	Civil Construction Cost Estimation	2	(3)
3121-2009	Reinforced Concrete Design	3	(3)
3121-2010	Timber and Steel Design	3	(3)
3121-2011	Computer Aided Drawing for Civil Construction	2	(3)
3121-2012	Construction Administration and Management	3	(3)
3121-2013	Hydraulics	3	(4)

2.3 Specialized Vocational Courses (not less than)15 credits

Code	Course Title	Cr	(Hr)
3121-2101	Civil Construction Practice in Workplace	3	(6)
3121-2102	Civil Construction Drawing	3	(6)
3121-2103	Construction Safety	2	(2)
3121-2104	Construction Machinery	2	(2)
3121-2105	Construction Law	2	(2)
3121-2106	Highway Materials Testing	2	(3)
3121-2107	Disaster of Building	2	(2)
3121-2108	Civil Construction control and Inspection	2	(2)
3121-2109	Sanitary Systems	2	(2)
3121-2110	Structural Analysis	3	(3)
3121-2111	Foundation Engineering	3	(3)
3121-2112	Traffic Engineering	2	(2)
3121-2113	Irrigation	3	(3)
3121-2114	Construction Surveying	2	(3)
3121-4101	Civil Construction Apprenticeship1	4	(*)
3121-4102	Civil Construction Apprenticeship 2	4	(*)
3121-4103	Civil Construction Apprenticeship 3	4	(*)
3121-4104	Civil Construction Apprenticeship 4	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)
3121-6001	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.

Rubber and Polymer Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study: Industrial Trades
Program : Rubber and Polymer Technology
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 Rubber and polymer technology. 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 Rubber and Polymer Technology.
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 rubber and polymer work.
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 Rubber and Polymer Technology.

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. Conduct chemical rubber and polymer experiment ; develop skills for instrument operation and maintenance ; select and use chemicals properly in laboratory
7. Prepare raw materials of rubber and polymer products and operate rubber and polymer product processing
8. Inspect ,and control the quality and solve the problem of rubber and polymer products

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study: Industrial Trades
Program: Rubber and Polymer Technology

For the fulfillment of the courses, graduates should have completed at least 92 credits from the 5 groups of courses below.

1. General Courses (not less than)		**21**	**credits**
1.1 Basic General Courses	**13 credits**		
1.2 Vocational-based General Courses (not less than)	**8 credits**		
2. Vocational Courses (not less than)		**65**	**credits**
2.1 Basic Vocational Courses	**14 credits**		
2.2 Core Vocational Courses	**26 credits**		
2.3 Specialized Vocational Courses (not less than)	**21 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)		**92**	**credits**

Entry into this program requires satisfactory completion of the MS 6 (grade 12) in Science-Mathematic 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)
3123-0001	Basic Mathematics	3	(3)
3123-0002	Basic Chemistry	3	(3)
3123-0003	Basic Physics	3	(3)
	Total	**9**	**(9)**

1. General Courses (not less than) 21 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) 8 credits

Code	Course Title	Cr	(Hr)
3000-120X	English (Elective)	1	(2)
3000-120X	English (Elective)	1	(2)
3000-140X	Science (Elective)	3	(4)
3000-1525	Calculus 1	3	(3)

2. Vocational Courses (not less than) 65 credits

2.1 Basic Vocational Courses 14 credits

Students must take the compulsory courses (3100-0601, 3100-0602) and select one course from 3000-010X and one from 3000-020X to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3100-0601	General Chemistry	4	(5)
3100-0602	General Organic Chemistry	4	(5)
3000-100X	Quality Management (Elective)	3	(3)
3000-020X	Computer Technology (Elective)	3	(4)

Remarks : The code with X will be chosen from the appendi**x.**

2.2 Core Vocational Courses 26 credits

Students must take 8 compulsory courses (3122-2001 - 3122-2008) and select course from the remainder to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3122-2001	Natural Rubber	2	(2)
3122-2002	Synthetic Rubber	2	(2)
3122-2003	Additives for Rubber Industry	2	(2)
3122-2004	Rubber Processing	3	(3)
3122-2005	Latex Product 1	3	(6)
3122-2006	Rubber Product 1	3	(6)
3122-2007	Latex Technology	2	(3)
3122-2008	Physical Testing of Raw Rubber and Rubber Products	3	(4)
3122-2009	Rubber Formulation	2	(2)
3122-2010	Polymer Chemistry	4	(5)
3122-2011	Introduction to Plastic Technology	2	(2)
3122-2012	Polymer Characterization	4	(5)

2.3 Specialized Vocational Courses (not less than) 22 credits

Code	Course Title	Cr	(Hr)
3122-2101	Rubber Product Design	2	(2)
3122-2102	Manufacturing of Raw Rubber	2	(3)
3122-2103	Latex Product 2	3	(6)
3122-2104	Rubber Product 2	3	(6)
3122-2105	Standards for Rubber Products	2	(2)
3122-2106	Structure, Properties and Application of Polymer	2	(2)
3122-2107	Plastic Materials	2	(2)
3122-2108	Plastic Products	3	(6)
3122-2109	Rubber Industrial Machines	3	(3)
3122-2110	Maintenance of Rubber Machines	2	(4)
3122-2111	Rubber Economics	2	(2)
3100-0604	General Analytical Chemistry	4	(5)
3111-2105	Plant Layout and Installation	3	(6)
3123-2101	Safety in Chemical Practice	3	(3)
3123-2105	Environmental Technology	4	(5)
3123-2113	Industrial Chemical Process	3	(3)
3124-2101	Petroleum Technology	4	(5)
3122-4101	Rubber and Polymer Technology Apprenticeship 1	6	(*)
3122-4102	Rubber and Polymer Technology Apprenticeship 2	6	(*)
3122-4103	Rubber and Polymer Technology Apprenticeship 3	5	(*)
3122-4104	Rubber and Polymer Technology Apprenticeship 4	5	(*)

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)
3122-6001	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.

Industrial Chemistry

2003 Curriculum for Diploma of Vocational Education
Area of Study: Industrial Trades
Program: Industrial Chemistry
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 Industrial Chemistry. 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 Industrial Chemistry.
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 industrial chemistry work.
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 Industrial Chemistry.

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. Operate analytical and synthetic works and conduct test of substances in laboratiies
7. Use analytical instrument in analytical work.
8. Test, control, research and develop the production process.

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

For the fulfillment of the courses, graduates should have completed at least 94 credits from the 5 groups of courses below.

1. General Courses (not less than)		**21**	**credits**
1.1 Basic General Courses	**13 credits**		
1.2 Vocational-based General Courses (not less than)	**8 credits**		
2. Vocational Courses (not less than)		**67**	**credits**
2.1 Basic Vocational Courses	**14 credits**		
2.2 Core Vocational Courses	**24 credits**		
2.3 Specialized Vocational Courses (not less than)	**25 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)		**94**	**credits**

Entry into this program requires satisfactory completion of the M 6(grad 12) in science-math 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)
3123-0001	Basic Mathematics	3	(3)
3123-0002	Basic Chemistry	3	(3)
3123-0003	Basic Physics	3	(3)
	Total	**9**	**(9)**

1. General Courses (not less than) 21 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) 8 credits

Code	Course Title	Cr	(Hr)
3000-122X	English (Elective)	1	(2)
3000-122X	English (Elective)	1	(2)
3000-142X	Science (Elective)	3	(4)
3000-1525	Calculus 1	3	(3)

2. Vocational Courses (not less than) 67 credits

2.1 Basic Vocational Courses 14 credits

Students must take the compulsory courses (3100-0601, 3100-0603) and select one course from 3000-100X and one from 3000-020X to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3100-0601	General Chemistry	4	(5)
3100-0603	General Physical Chemistry	4	(5)
3000-100X	Quality Management (Elective)	3	(3)
3000-020X	Computer Technology (Elective)	3	(4)

Remarks : The code with X will be chosen from the appendi**x.**

2.2 Core Vocational Courses 24 credits

Students must take 5 (3123-2001-3123-2005) compulsory courses and select courses from the remainder to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3123-2001	Analytical Chemistry 1	4	(5)
3123-2002	Analytical Chemistry 2	4	(5)
3123-2003	Organic Chemistry 1	4	(5)
3123-2004	Organic Chemistry 2	4	(5)
3123-2005	Polymer Chemistry	4	(5)
3123-2006	Analytical Instrument	4	(5)
3123-2007	Inorganic Chemistry	4	(5)

2.3 Specialized Vocational Courses (not less than) 25 credits

Code	Course Title	Cr	(Hr)
3123-2101	Safety in Chemical Practice	3	(3)
3123-2102	Microbiology	4	(5)
3123-2103	Biochemistry	3	(3)
3123-2104	Natural Products	4	(5)
3123-2105	Environmental Technology	4	(5)
3123-2106	Fermentation Technology	3	(3)
3123-2107	Food Technology	3	(3)
3123-2108	Rubber Technology	3	(3)
3123-2109	Dyeing Technology	3	(3)
3123-2110	Fiber Science	3	(3)
3123-2111	Nuclear Chemistry	3	(3)
3123-2112	Pharmaceutical Chemistry	3	(3)
3123-2113	Industrial Chemical Process	3	(3)
3123-4101	Chemical Practice Apprenticeship 1	7	(*)
3123-4102	Chemical Practice Apprenticeship 2	7	(*)
3123-4103	Chemical Practice Apprenticeship 3	6	(*)
3123-4104	Chemical Practice Apprenticeship 4	6	(*)

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)
3123-6001	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.

Petrochemicals

2003 Curriculum for Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Petrochemicals
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 Petrochemicals. 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 Petrochemicals.
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 petrochemical work.
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 Petrochemicals.

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. Calculate amount of stoichiometry, analysis the substances and chemical reaction in industry
7. Control of operation of equipments in production process
8. Provide plans and maintenance of equipment in production process
9. Measure and control the variables in production process
10. Manage and develop safety system in production process
11. Test the quality of raw materials and products in production process

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

For the fulfillment of the courses, graduates should have completed at least 99 credits from the 5 groups of courses below.

1. General Courses (not less than)		**21**	**credits**
1.1 Basic General Courses	**13 credits**		
1.2 Vocational-based General Courses (not less than)	**8 credits**		
2. Vocational Courses (not less than)		**72**	**credits**
2.1 Basic Vocational Courses	**14 credits**		
2.2 Core Vocational Courses	**30 credits**		
2.3 Specialized Vocational Courses (not less than)	**24 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)		**99**	**credits**

Entry into this program requires satisfactory completion of the M 6 (grad 12) in science-math 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)
3123-0001	Basic Mathematics	3	(3)
3123-0002	Basic Chemistry	3	(3)
3123-0003	Basic Physics	3	(3)
	Total	**9**	**(9)**

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) 8 credits

Code	Course Title	Cr	(Hr)
3000-120X	English (Elective)	1	(2)
3000-120X	English (Elective)	1	(2)
3000-142X	Science (Elective)	3	(4)
3000-1525	Calculus 1	3	(3)

2. Vocational Courses (not less than) 72 credits

2.1 Basic Vocational Courses 14 credits

Students must take the compulsory courses (3100-0601, 3100-0603) and select one course from 3000-100X and one from 3000-020X to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3100-0601	General Chemistry	4	(5)
3100-0603	General Physical Chemistry	4	(5)
3000-100X	Quality Management (Elective)	3	(3)
3000-020X	Computer Technology (Elective)	3	(4)

Remarks : The code with X will be chosen from the appendi**x.**

2.2 Core Vocational Courses 30 credits

Code	Course Title	Cr	(Hr)
3100-0602	General Organic Chemistry	4	(5)
3124-2001	Instrument and Process Control	3	(4)
3124-2002	Petrochemical Industrial Drawing	3	(4)
3124-2003	Basic Calculation for chemical Engineering	3	(3)
3124-2004	Chemical Engineering Kinetics	3	(3)
3124-2005	Unit Operation for Chemical Industry 1	5	(7)
3124-2006	Unit Operation for Chemical Industry 2	5	(7)
3124-2007	Polymer chemistry	4	(5)

2.3 Specialized Vocational Courses (not less than)24 credits

Code	Course Title	Cr	(Hr)
3124-2101	Petroleum Technology	4	(5)
3124-2102	Petrochemical Technology	3	(3)
3124-2103	Plastic Technology	4	(5)
3124-2104	Industrial Maintenance	2	(2)
3124-2105	Power and Utilities for Petrochemical Industry	2	(2)
3124-2106	Industrial Safety	3	(3)
3124-2107	Heat Conservation	3	(3)
3124-2108	Basic Electrical Industry	2	(3)
3100-0604	General Analytical Chemistry	4	(5)
3123-2006	Chemical Analytical Instrument	4	(5)
3123-2101	Safety in Chemical Practice	3	(3)
3123-2105	Environmental Technology	4	(5)
3123-2113	Industrial Chemical Process	3	(3)
3124-4101	Petrochemical Practice Apprenticeship 1	6	(*)
3124-4102	Petrochemical Practice Apprenticeship 2	6	(*)
3124-4103	Petrochemical Practice Apprenticeship 3	6	(*)
3124-4104	Petrochemical Practice Apprenticeship 4	6	(*)

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)
3124-6001	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.

Mechatronics

2003 Curriculum for Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Mechatronics
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 Mechatronics. 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 Mechatronics.
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 careers.
3. To promote critical thinking, problem solving skills and creative thinking; and to provide the ability to bring the technology into the development of mechatronics work.
4. To promote good personality; responsibility to themselves, family and society; morals and ethics; and good manners in their careers.
5. To provide the ability to work in industrial workplaces or in self-employment in the field of Mechatronics .

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. Design/, draw electrical and electronic drawing
7. Design and draw mechanical drawing
8. Design and draw pneumatic and hydraulics drawing
9. Install electrical and electronic devices and equipment
10. Install mechanical devices and equipments
11. Install pneumatic and hydraulic devices and equipment
12. Control electrical and electronic devices and equipment
13. Control pneumatic and hydraulic devices and equipment
14. Maintain electrical devices and equipment
15. Maintain mechanical devices and equipment
16. Maintain pneumatic and hydraulic devices and equipment

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

For the fulfillment of the courses, graduates should have completed at least 92 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)		**62**	**credits**
2.1 Basic Vocational Courses	**15**	**credits**	
2.2 Core Vocational Courses	**25**	**credits**	
2.3 Specialized Vocational Courses (not less than)	**18**	**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)		**92**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Mechatronics, Electrical and Electronics, Mechanical 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)
3102-0002	Basic Machine Tools	3	(5)
3127-0001	Production Process	2	(3)
3127-0002	Electronic Device and Circuit	3	(5)
3127-0003	Digital and Microprocessor	3	(5)
	Total	**18**	**(31)**

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)
3000-120X	English (Elective)	1	(2)
3000-120X	English (Elective)	1	(2)
3000-140X	Science (Elective)	3	(4)
3000-1521	Mathematics 2	3	(3)
3000-1525	Calculus 1	3	(3)

2. Vocational Courses (not less than) 62 credits

2.1 Basic Vocational Courses 15 credits

Students must take the compulsory courses (3100-0101 to 3127-1002) and select one course from 3000-100X and one from 3000-020X to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3100-0101	Mechanical Engineering	3	(3)
3127-1001	Electric Circuits	3	(4)
3127-1002	Electronics circuits	3	(4)
3000-010X	Quality Management (Elective)	3	(3)
3000-020X	Computer Technology (Elective)	3	(4)

Remarks : The code with X will be chosen from the appendi**x.**

2.2 Core Vocational Courses 25 credits

Students must take 8 compulsory courses (3100-0106 to 3127-2006) and select courses from the remainder to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3100-0106	Pneumatics and Hydraulics	3	(4)
3100-0115	Production Process	2	(3)
3127-2001	Digital Circuits	3	(4)
3127-2002	Basic Mechatronics	2	(2)
3127-2003	Sensor and Transducer	3	(4)
3127-2004	Automation Control	3	(4)
3127-2005	Programmable Logic Control	3	(4)
3127-2006	Microcontroller	3	(4)
3127-2007	Machining Technology	3	(4)
3127-2008	Servomechanism 1	3	(4)

2.3 Specialized Vocational Courses (not less than) 18 credits

Code	Course Title	Cr	(Hr)
3100-0157	Manufacturing Planning and Process Control	2	(2)
3127-2101	CNC Technology	3	(4)
3127-2102	CAD/CAM Technology	2	(3)
3127-2103	Industrial Robot	2	(3)
3127-2104	Electric Machine Control	3	(4)
3127-2105	Factory Automation	2	(3)
3127-2106	Servomechanism 2	3	(4)
3127-2107	Computer Programming	2	(3)
3127-2108	Measurements and Quality Control	3	(4)
3127-2109	Mechatronic System Design	3	(4)
3127-2110	Electronic Product Manufachring	3	(4)
3127-2111	Communications and Network Systems	3	(4)
3127-2112	Production System by Computer Control	3	(3)
3127-2113	Mechatronic Maintenance Management	3	(3)
3127-2114	Electric and Electronic Mathematics	3	(3)
3127-2115	Mechatronic Invention	3	(*)
3127-2116	Advanced Topics in Mechatronics	3	(*)
3127-2117	Mechatronics Special Problems	3	(*)
3127-4101	Mechatronics Apprenticeship 1	*	(*)
3127-4102	Mechatronics Apprenticeship 2	*	(*)
3127-4103	Mechatronics Apprenticeship 3	*	(*)
3127-4104	Mechatronics Apprenticeship 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)
3127-6001	Projects	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.

Computer Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study : Industrial Trades
Program : Computer Technology
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 Computer Technology. 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 Computer Technology.
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 careers.
3. To promote critical thinking, problem-solving skills and creative thinking; and to provide the ability to bring the technology into the development of computer work.
4. To promote good personality; responsibility to themselves, family and society; morals and ethics; and good manners in their careers.
5. To provide the ability to work in industrial workplaces or in self-employment in the field of Computer Technology.

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 attribution of technicians
6. Provide services of digital and electronic circuits
7. Computer programs development
8. Inspect and repair computers and peripheral equipment
9. Provide information services

Computer Hardware Specialization

10. Provide services of computer hard wares and peripheral equipments.
11. Provide services of electrical machine control systems by computers.

Computer Software Specialization

10. Develop and use application programs.
11. Develop computer programming.

Network & Information Systems Specialization

10. Provide services of computer network.
11. Provide services of information systems and Internet.

Multimedia Specialization

10. Provide services of computer multimedia.
11. Provide services of computer graphics.

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study : Industrial Trades
Program: Computer Technology

For the fulfillment of the program, graduates should have completed at least 94 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)		**64**	**credits**
2.1 Basic Vocational Courses	**15**	**credits**	
2.2 Core Vocational Courses	**27**	**credits**	
2.3 Specialized Vocational Courses (not less than)	**18**	**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)		**94**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Electrical and Electronics 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)
3100-0001	Basic Bench Work	3	(5)
3100-0002	Technical Drawing	2	(4)
3100-0003	Electrical and Electronics Work	2	(4)
3105-0001	Basic Electric Circuits and Instruments	3	(4)
3105-0002	Electronics Drawing	2	(3)
3105-0003	Basic Electronics Circuits	2	(3)
3105-0004	Basic Pulse and Digital Circuit	2	(3)
3128-0001	Basic Microprocessor	3	(5)
	Total	**19**	**(31)**

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)
3000-120X	English (Elective)	1	(2)
3000-120X	English (Elective)	1	(2)
3000-140X	Science (Elective)	3	(4)
3000-1521	Mathematics 2	3	(3)
3000-1525	Calculus 1	3	(3)

2. Vocational Courses (not less than) 64 credits

2.1 Basic Vocational Courses 15 credits

Students must take the compulsory courses (3128-1001 to 3128-1003) and select one course from 3000-100X and one from 3000-020X to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3128-1001	Electronics Technology	3	(4)
3128-1002	Digital Circuit	3	(4)
3128-1003	Structure Programming 1	3	(4)
3000-010X	Quality Management (Elective)	3	(3)
3000-020X	Computer Technology (Elective)	3	(4)

Remarks : The code with X will be chosen from the appendi**x.**

2.2 Core Vocational Courses 27 credits

Students must take 5 compulsory courses (3128-2001 to 3128 -2005) and select courses from the remainder to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3128-2001	Operating System	3	(4)
3128-2002	Computers and Peripheral Devices	3	(4)
3128-2003	Computer Network Systems	3	(4)
3128-2004	Data Structures	3	(4)
3128-2005	Object-Oriented Programming 1	3	(4)
3128-2006	Digital Circuit Designs	3	(4)
3128-2007	Microprocessor Application	3	(4)
3128-2008	Interface Techniques	3	(4)
3128-2009	System Analysis and Design	3	(4)
3128-2010	Data Communications	3	(4)
3128-2011	Network Administration and Management	3	(4)
3128-2012	Internet Technology	3	(4)

3128-2013	Object-Oriented Analysis and Designs	3	(4)
3128-2014	Computer Graphic Programs	3	(4)
3128-2015	Application Program Usage	3	(4)
3128-2016	Web Designs and Development	3	(4)
3128-2017	Web Programming 1	3	(4)
3128-2018	Web Programming 2	3	(4)
3128-2019	Multimedia Devices	3	(4)
3128-2020	Multimedia on Web	3	(4)
3128-2021	Introduction to Multimedia Technology	3	(4)
3128-2022	Application Package in Multimedia	3	(4)

2.3 Specialized Vocational Courses (not less than) 18 credits

Students must take at least 18 credits from the Specialized Vocational Courses. These can be taken from one field of specialization.

1. Computer Hardware Specialization

Code	Course Title	Cr	(Hr)
3128-2101	Assembly Language Programming	3	(4)
3128-2102	Application of Computers in Industrial Work	3	(4)
3128-2103	Maintenance of Computers and peripheral Devices	3	(4)
3128-2104	Microcontroller	3	(4)
3128-2105	Programmable Logic Control	3	(4)
3128-2106	Service and Maintenance in Computer Hardware	3	(4)
3128-2107	Computer Hardware Projects	3	(4)
3128-2108	Advanced Topic in Computer Hardwares	3	(4)
3128-2109	Special Problems in Computer Hardwares	3	(4)
3128-4101	Computer Hardware Apprenticeship 1	5	(*)
3128-4102	Computer Hardware Apprenticeship 2	5	(*)
3128-4103	Computer Hardware Apprenticeship 3	4	(*)
3128-4104	Computer Hardware Apprenticeship 4	4	(*)

2. Computer Software Specialization

Code	Course Title	Cr	(Hr)
3128-2201	Structure Programming 2	3	(4)
3128-2202	Computer Graphics programming	3	(4)
3128-2203	File Processing	3	(4)
3128-2204	Object-Oriented Programming 2	3	(4)
3128-2205	Computer Assist Designs	3	(4)
3128-2206	Software Engineering	3	(4)
3128-2207	Fundamental of Artificial Intelligence	3	(4)
3128-2208	Computer Software Services	3	(4)
3128-2209	Innovation in Computer Softwares	3	(4)
3128-2210	Advanced Topic in Computer Softwares	3	(4)
3128-2211	Special Problems in Computer Softwares	3	(4)
3128-4201	Computer Software Apprenticeship 1	5	(*)
3128-4202	Computer Software Apprenticeship 2	5	(*)
3128-4203	Computer Software Apprenticeship 3	4	(*)
3128-4204	Computer Software Apprenticeship 4	4	(*)

3. Network & Information Systems Specialization

Code	Course Title	Cr	(Hr)
3128-2301	Information Technology	3	(4)
3128-2302	Linux Operation System	3	(4)
3128-2303	Unix Operation System	3	(4)
3128-2304	Database Management on Network	3	(4)
3128-2305	Network Security	3	(4)
3128-2306	Network Testing and Measurement	3	(4)
3128-2307	Service and Maintenance in Computer Network	3	(4)
3128-2308	Innovation in Computer Network	3	(4)
3128-2309	Advance Topic in Computer Network	3	(4)
3128-2310	Special Problems in Computer Network	3	(*)
3128-4301	Computer Network Apprenticeship 1	5	(*)
3128-4302	Computer Network Apprenticeship 2	5	(*)
3128-4303	Computer Network Apprenticeship 3	4	(*)
3128-4304	Computer Network Apprenticeship 4	4	(*)

4. Multimedia Specialization

Code	Course Title	Cr	(Hr)
3128-2401	Image Processing	3	(4)
3128-2402	Multimedia Programming	3	(4)
3128-2403	Computer Assisted Instruction	3	(4)
3128-2404	Analysis Multimedia systems and designs	3	(4)
3128-2405	Digital Video Production	3	(4)
3128-2406	Multimedia Application	3	(4)
3128-2407	Operation and Maintenance of Multimedia Devices	3	(4)
3128-2408	Application Software in Multimedia Technology	3	(4)
3128-2409	Service and Maintenance in Computer Multimedia	3	(4)
3128-2410	Innovation in Computer Multimedia	3	(4)
3128-2411	Advance Topic in Computer Multimedia	3	(4)
3128-2412	Special Problems in Computer Multimedia	3	(4)
3128-4401	Computer Multimedia Apprenticeship 1	5	(*)
3128-4402	Computer Multimedia Apprenticeship 2	5	(*)
3128-4403	Computer Multimedia Apprenticeship 3	4	(*)
3128-4404	Computer Multimedia Apprenticeship 4	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)
3128-6001	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.

Textile Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study : Textile Industry
Program : Textile Technology
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 Textile Technology. 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 Textile Technology.
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 textile work.
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 Textile Technology.

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. Analyzes yarns type.
7. Manage and solve problems in the textile industry
8. Plan, test and control textile quality
9. Plan, inspect and control yarn production
10. Prepare the test pieces, design and analyze woven fabric
11. Prepare the test pieces, design and analyze knitted fabric
12. Plan, control and test weaving production process
13. Plan, control and test knitting production process
14. Plan, control and test non-woven fabric production process

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study : Textile Industry
Program : Textile Technology

For the fulfillment of the program, graduates should have completed at least 93 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)		**60**	**credits**
2.1 Basic Vocational Courses	**13**	**credits**	
2.2 Core Vocational Courses	**23**	**credits**	
2.3 Specialized Vocational Courses (not less than)	**20**	**credits**	
2.4 Project	**4**	**credits**	
3. Free Elective Courses (not less than)		**9**	**credits**
4. On-the-job Training (not less than 1 Semester)			
5. Extracurricular Activities 120 Hours			
Total (not less than)		**93**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Textile Technology 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)
3801-0001	Textile Fiber Materials	2	(2)
3801-0002	Woven Fabric	3	(5)
3801-0003	Knitted Fabric	2	(3)
3801-0004	Textile Mechanical Parts	2	(3)
3801-0005	Textile Material -Testing	2	(3)
3801-0006	Spinning Techniques	1	(1)
	Total	**15**	**(22)**

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) 60 credits

2.1 Basic Vocational Courses 13 credits

Students must take the compulsory courses (3100-0101, 3801-1001, 3801-1002) 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	3	(3)
3801-1001	Fiber Science	2	(2)
3801-1002	Industrial Electricity	2	(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 appendi**x.**

2.2 Core Vocational Courses 23 credits

Code	Course Title	Cr	(Hr)
3801-2001	Weaving preparation	2	(3)
3801-2002	Knitting Technology	2	(3)
3801-2003	Weaving Technology 1	2	(3)
3801-2004	Weaving Technology 2	2	(3)
3801-2005	Woven Fabric Design and Analysis	2	(3)
3801-2006	Textile -Testing	2	(3)
3801-2007	Knitted Fabric Design and Analysis	2	(3)
3801-2008	Textile Quality Control	2	(2)
3801-2009	Spinning Technology	3	(3)
3801-2010	Carpet and Non-Woven Fabric	2	(2)
3801-2011	Textile Engineering	2	(2)

2.3 Specialized Vocational Courses (not less than) 20 credits

Code	Course Title	Cr	(Hr)
3801-2101	Weaving Preparation Technology	5	(8)
3801-2102	Machine Weaving Technology	5	(8)
3801-2103	Woven Fabric Design and Analysis Technology	5	(8)
3801-2104	Textile Management	2	(2)
3802-2006	Textile Printing 1	2	(4)
3100-0108	Machine Elements	3	(3)
3100-0152	Industrial Management	3	(3)
3801-4101	Textile Technology Apprenticeship1	5	(*)
3801-4102	Textile Technology Apprenticeship 2	5	(*)
3801-4103	Textile Technology Apprenticeship 3	5	(*)
3801-4104	Textile Technology Apprenticeship 4	5	(*)

For the Dual System (apprenticeship) 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)
3801-6001	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.

Textile Chemistry

2003 Curriculum for Diploma of Vocational Education
Area of Study : Textile Industry
Program : Textile Chemistry
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 Textile Chemistry. 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 Textile Chemistry.
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 textile chemistry work.
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 Textile Chemistry.

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. Analyze fiber by physical method
7. Analyze fiber by chemical method
8. Practice qualitative analysis
9. Practice quantity analysis
10. Dye cellulose, protein , synthetic and blended fiber
11. Match colors from sample
12. Print fabric and garment
13. Print by matching patterns and colors
14. Finish fabric by mechanical method
15. Finish fabric by chemical process
16. Print and dye by machine
17. Maintain the dying and printing machines

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study : Textile Industry
Program : Textile Chemistry

For the fulfillment of the program, graduates should have completed at least 92 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)		**62**	**credits**
2.1 Basic Vocational Courses	**13**	**credits**	
2.2 Core Vocational Courses	**29**	**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)		**92**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Textile Chemistry 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)
3100-0002	Technical Drawing	2	(4)
3100-0003	Electricity and Electronics Work	2	(4)
3802-0001	Fibers	2	(2)
3802-0002	Fabric	2	(2)
3802-0003	Textile Testing	2	(3)
3802-0004	Fundamental Chemistry	2	(4)
3802-0005	Application Chemistry in Textile	2	(4)
3802-0006	Principle Dyeing	2	(4)
	Total	**16**	**(27)**

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) 62 credits

2.1 Basic Vocational Courses 13 credits

Students must take the compulsory courses (3100-0101, 3801-1001, 3801-1002) and select one course from 3000-010X and one from 3000-020X to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3100-0101	Engineering Mechanics	3	(3)
3801-1001	Fiber Science	2	(2)
3801-1002	Industrial Electricity	2	(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 appendi**x.**

2.2 Core Vocational Courses 29 credits

Code	Course Title	Cr	(Hr)
3802-2001	Inorganic Chemistry	3	(4)
3802-2002	Organic Chemistry	3	(4)
3802-2003	Analytical Chemistry	3	(4)
3802-2004	Dyeing 1	3	(4)
3802-2005	Dyeing 2	3	(4)
3802-2006	Textile Printing 1	2	(4)
3802-2007	Finishing Techniques	3	(4)
3802-2008	Textile Testing	2	(3)
3802-2009	Chemical Textile Machine	2	(2)
3802-2010	Polymer	2	(2)
3802-2011	Analytical Fiber and Fabric Property	3	(4)

2.3 Specialized Vocational Courses (not less than) 16 credits

Code	Course Title	Cr	(Hr)
3802-2101	Colour in Textile	2	(2)
3802-2102	Dyeing 3	3	(4)
3802-2103	Textile Printing 2	2	(4)
3802-2104	Analytical Instrument	3	(3)
3802-2105	Computer Colour Matching	2	(3)
3801-2008	Textile Quality Control	2	(2)
3801-2011	Textile Engineering	2	(2)
3802-4101	Textile Chemistry Apprenticeship 1	4	(*)
3802-4102	Textile Chemistry Apprenticeship 2	4	(*)
3802-4103	Textile Chemistry Apprenticeship 3	4	(*)
3802-4104	Textile Chemistry Apprenticeship 4	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)
3802-6001	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.

Garment Industry

2003 Curriculum for Diploma of Vocational Education
Area of Study : Textile Industry
Program : Garment Industry
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 Garment Industry. 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 Garment Industry.
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 garment industry work.
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 Garment Industry.

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. Analyze and test yarn
7. Analyze and test Fabric
8. Plan the production of industry garment
9. Control the production of industry garment

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study : Textile Industry
Program : Garment Industry

For the fulfillment of the program, graduates should have completed at least 87 credits from the 5 groups of courses below.

1. General Courses (not less than)		**21**	**credits**
1.1 Basic General Courses	**13 credits**		
1.2 Vocational-based General Courses (not less than)	**8 credits**		
2. Vocational Courses (not less than)		**60**	**credits**
2.1 Basic Vocational Courses	**13 credits**		
2.2 Core Vocational Courses	**23 credits**		
2.3 Specialized Vocational Courses (not less than)	**20 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)		**87**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in Garment 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)
3100-0002	Technical Drawing	2	(4)
3100-0003	Electricity and Electronics Work	2	(4)
3802-0001	Fibers	2	(2)
3802-0002	Fabric	2	(2)
3803-0001	Use and Maintenance of Machine and Equipment	2	(4)
3803-0002	Industrial Sewing System	2	(4)
3803-0003	Basic of Cloth sewing	3	(5)
3803-0004	Fashion Design	2	(3)
3803-0005	Grading and Pattern-Making	2	(4)
3803-0006	Production-Planning	2	(2)
	Total	**21**	**(34)**

1. General Courses (not less than) 21 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) 8 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)

2. Vocational Courses (not less than) 60 credits

2.1 Basic Vocational Courses 13 credits

Students must take the compulsory courses (3100-0101, 3801-1001, 3801-1002) 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	3	(3)
3801-1001	Fiber Science	2	(2)
3801-1002	Industrial Electricity	2	(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 appendi**x.**

2.2 Core Vocational Courses 23 credits

Code	Course Title	Cr	(Hr)
3803-2001	Computer for Garment Production	2	(3)
3803-2002	Production system and Planning	2	(2)
3803-2003	Industrial Garment Production 1	3	(5)
3803-2004	Industrial Garment Production 2	3	(5)
3803-2005	Industrial Garment Production 3	3	(5)
3803-2006	Industrial Garment Production 4	3	(5)
3803-2007	Garment Quality Control	2	(2)
3803-2008	Textile Production	3	(5)
3803-2009	Garment Production Materials	2	(2)

2.3 Specialized Vocational Courses (not less than) 20 credits

Code	Course Title	Cr	(Hr)
3803-2101	Technique of Night Gown Production	3	(5)
3803-2102	English for Garment	2	(2)

3803-2103	Technique of Uniform Production	3	(5)
3803-2104	Technique of Underwear Production	2	(3)
3803-2105	Technique of Jacket Production	3	(5)
3803-2106	Industrial Embroidery	2	(3)
3803-2107	Garment Packing	2	(3)
3803-2108	Technique of Jean Production	3	(5)
3803-4101	Garment Production Apprenticeship1	5	(6)
3803-4102	Garment Production Apprenticeship 2	5	(6)
3803-4103	Garment Production Apprenticeship 3	5	(6)
3803-4104	Garment Production Apprenticeship 4	5	(6)

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)**
3803-6001	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.

Silk-weaving & Folk Textile

2003 Curriculum for Diploma of Vocational Education
Area of Study : Textile Industry
Program : Silk-Weaving & Folk Textile
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 Silk-Weaving & Folk Textile. 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 Silk-Weaving & Folk Textile.
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 silk-weaving & Folk textile work.
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 Silk-Weaving & Folk Textile.

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. Plant mulberry and sericulture
7. Spine yarn for silk-weaving and folk textile
8. Dye and paint fabric
9. Weave silk and folk textile
10. Design weaving ornament fabric by computer
11. Control the quality of silk-weaving and folk textile
12. Test and analyze weaving products

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study : Textile Industry
Program : Silk-weaving&Folk textile

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)		**60**	**credits**
2.1 Basic Vocational Courses	**13**	**credits**	
2.2 Core Vocational Courses	**24**	**credits**	
2.3 Specialized Vocational Courses (not less than)	**19**	**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)		**90**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in all area of study 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)
3804-0001	Introduction to Textile Industry	3	(4)
	Total	**3**	**(4)**

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) 60 credits

2.1 Basic Vocational Courses 13 credits

Students must take the compulsory courses (3801-1001to1003) and select one course from 3000-100X and one from 3000-020X to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3804-1001	Art of Thai-Ornament Analysis	2	(4)
3804-1002	Basic Weaving Ornament Design	2	(4)
3804-1003	Introduction to Business	3	(3)
3000-010X	Quality Management (Elective)	3	(3)
3000-020X	Computer Technology (Elective)	3	(4)

Remarks : The code with X will be chosen from the appendi**x.**

2.2 Core Vocational Courses 24 credits

Code	Course Title	Cr	(Hr)
3804-2001	Dyeing Technology	3	(5)
3804-2002	Yarn Spinning Technology	3	(3)
3804-2003	Weaving Technology 1	3	(5)
3804-2004	Weaving Technology 2	3	(5)
3804-2005	Woven Fabric Design and Analysis	2	(4)
3804-2006	Fabric Testing and Analysis	2	(4)
3804-2007	Computer Aided weaving Ornament Design	2	(3)
3804-2008	Mulberry Planting and Sericulture	3	(5)
3804-2009	Textile Quality Control	3	(3)

2.3 Specialized Vocational Courses (not less than) 19 credits

Code	Course Title	Cr	(Hr)
3804-2101	Chok Weaving	3	(5)
3804-2102	Mud Mi Weaving	3	(5)
3804-2103	Hangkrarok Weaving	3	(5)
3804-2104	Prae Wa Weaving	3	(5)
3804-2105	Yok Dhok Weaving	3	(5)
3804-2106	Kit Weaving	2	(4)
3804-2107	Textile Machine Maintenance	2	(2)
3804-2108	Clothing Design	2	(4)
3804-2109	Introduction to Clothes Making	2	(3)
3804-2110	Thai Silk and Fabric Innovation	2	(4)
3804-2111	Fabric Dyeing and Painting	3	(5)
3804-2112	Sewing and Embroidery	2	(3)
3104-2113	Textile Package Design	3	(3)
3104-2114	Thai Silk and Folk Textile Seminar	1	(2)
3104-2115	Appropriate Technology Application	3	(3)
3804-2116	Muk Weaving	3	(5)
3804-2117	Lumpoon Yok Dhok Weaving	3	(5)
3804-2118	Khoa yor Weaving	3	(5)
3804-4101	Thai Silk and Folk textile Apprenticeship 1	5	(*)
3804-4102	Thai Silk and Folk textile Apprenticeship 2	5	(*)
3804-4103	Thai Silk and Folk textile Apprenticeship 3	4	(*)
3804-4104	Thai Silk and Folk textile Apprenticeship 4	4	(*)

For the Dual System (apprenticeship) 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)
3804-6001	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.

Information Technology

2003 Curriculum for Diploma of Vocational Education
Area of Study : Information and Communication Technology
Program : Information Technology
Objectives

The program aims at providing students with knowledge, skills, abilities, attitudes and experience which will enable them to perform as skilled technicians in the field of Information Technology. 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 Information Technology.
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 information technology work.
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 Information Technology.

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. Design and develop websites
7. Develop application programs by object-oriented approach
8. Design and develop database systems
9. Design, install, train and maintain network systems
10. Analyze and design the information and internet systems

Program Structure
2003 Curriculum for the Diploma of Vocational Education
Area of Study : Information and Communication Technology
Program : Information Technology

For the fulfillment of the program, graduates should have completed at least 91 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)		**61**	**credits**
2.1 Basic Vocational Courses	**15**	**credits**	
2.2 Core Vocational Courses	**24**	**credits**	
2.3 Specialized Vocational Courses (not less than)	**18**	**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)		**91**	**credits**

Entry into this program requires satisfactory completion of the Vocational Education Certificate in any program or secondary school (M6 or Grade 12) or equivalent.

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) 61 credits

2.1 Basic Vocational Courses 15 credits

Students must take the compulsory courses (3901-0101 - 3901-0104) and select one course from 3000-010X to fulfill the requirements.

Code	Course Title	Cr	(Hr)
3901-1001	Information Technology	3	(4)
3901-1002	Computer Programming 1	3	(4)
3901-1003	Database Systems	3	(4)
3901-1004	Computer Networking Fundamentals	3	(4)
3000-010X	Quality Management (Elective)	3	(3)

Remarks : The code with X will be chosen from the appendi**x.**

2.2 Core Vocational Courses 24 credits

Student must take 6 compulsory courses (3901-2001 to -2006) and select courses from the remainder to fulfill this requirements.

Code	Course Title	Cr	(Hr)
3901-2001	Computer Architecture and Operating Systems	3	(4)
3901-2002	Data Structures and Algorithms	3	(4)
3901-2003	Object-Oriented Analysis and Design	3	(4)
3901-2004	Implement of Database	3	(4)
3901-2005	Web Design and Development	3	(4)
3901-2006	Object-Oriented Programming 1	3	(4)
3901-2007	Software Engineering	3	(4)
3901-2008	Extensible Markup Language Programming	3	(4)
3901-2009	Web Programming 1	3	(4)
3901-2010	Web Programming 2	3	(4)
3901-2011	Introduction to IT for Business Administration	3	(3)

2.3 Specialized Vocational Courses (not less than)18 credits

Student must take at least 18 credits from the Specialized Vocational Courses.

Code	Course Title	Cr	(Hr)
3901-2101	Advanced dot Net Programming and File Security	3	(4)
3901-2102	Computer Network Maintenance	3	(5)
3901-2103	Linux Basic	3	(4)
3901-2104	Object-Oriented Programming 2	3	(4)
3901-2105	Object-Oriented Programming 3	3	(4)
3901-2106	Computer Programming 2	2	(3)
3901-2107	Computer Programming 3	2	(3)
3901-2108	Developing Win forms	2	(3)
3901-2109	E-Business Technology Fundamentals	3	(3)
3901-2110	E-Commerce Fundamentals	2	(2)
3901-2111	Introduction to dot Net	3	(4)
3901-2112	dot Net Server Side Scripting	3	(4)
3901-2113	Complus Services	2	(3)
3901-2114	Working with Web Service	2	(3)
3901-2115	System Analysis and Design	3	(4)
3901-2116	IT Project 1	1	(2)
3901-2117	IT Project 2	1	(2)
3901-2118	Seminar in Information Technology	3	(3)
3901-2119	Advance Topics in IT 1	3	(*)
3901-2120	Advance Topics in IT 2	2	(*)
3901-2121	Special Problems in IT 1	3	(*)
3901-2122	Special Problems in IT 2	2	(*)
3901-2123	IT Services	3	(5)
3901-4101	IT Apprenticeship 1	5	(*)
3901-4102	IT Apprenticeship 2	5	(*)
3901-4103	IT Apprenticeship 3	4	(*)
3901-4104	IT Apprenticeship 4	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)
3901-6001	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.

รวบรวมโดย

นายวิรัช คุณวุฒิวานิช (virach@bpcd.net)

สำนักมาตรฐานการอาชีวศึกษาและวิชาชีพ
สำนักงานคณะกรรมการการอาชีวศึกษา
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