

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
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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 appendix.

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.