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.