

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 appendix.

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 Manufacturing | 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.