

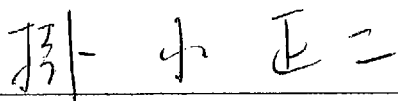
THE MINUTES OF MEETING
BETWEEN
THE JAPANESE SUPPLEMENTARY STUDY TEAM
AND
THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF
THE REPUBLIC OF TUNISIA
ON
THE JAPANESE TECHNICAL COOPERATION
FOR
THE PROJECT FOR THE ESTABLISHMENT OF THE SECTORIAL VOCATIONAL
TRAINING CENTER FOR THE ELECTRIC AND ELECTRONICS INDUSTRY

The Japanese Supplementary Study Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (JICA), headed by Mr. Seiji Kakemizu, visited the Republic of Tunisia from February 20 to March 10, 2000 for the purpose of formulating the detailed plan of the implementation of the Project for the Establishment of the Sectorial Vocational Training Center for the Electric and Electronics Industry (hereinafter referred to as "the Project").

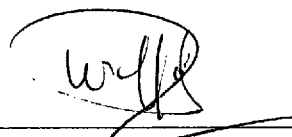
During the stay in the Republic of Tunisia, the Team exchanged a view of it and had a series of meetings with the Tunisian authorities concerned, represented by Mr. Mohammed Sadedem.

As a result of the discussions, the Team and the Tunisian authorities concerned agreed to report to their respective Governments the matters referred to the attached document.

Tunis, March 9, 2000



Seiji Kakemizu
Leader
Supplementary Study Team
Japan International Cooperation Agency
Japan



Mohammed Sadedem
Director Group of Studies, Planification,
Programmation and Prospective
Ministry of Vocational Training and
Employment
Republic of Tunisia

THE ATTACHED DOCUMENT

The discussions between the Team and Tunisian authorities concerned were held in Tunis with participants listed below;

TUNISIAN SIDE

Ministry of Vocational Training and Employment (MFPE)

Mohamed Saddam	Director of Study, Planification, Programmation and Prospective
Kamel Alimi	Deputy Director of Study, Planification, Programmation and Prospective
Zouhaier Hamdi	Chief of Project, Tunisian Agency of Vocational Training (ATFP)
Sofia Bahri	Responsible of Projects, National Center of Training Instructors and Engineering of Training (CENAFFIF)
Riadh Othmani	Electronic Engineer, CENAFFIF
Kamel El Mechri	Electronic Engineer, Den Den Polytechnic Center
Abderraouf Aissaoui	Electronic Engineer, ATFP

JAPANESE SIDE

Supplementary Study Team

Seiji Kakemizu	Leader
Sigemi Hiramatsu	Electronics
Toshihiko Yoshida	Electricity
Hiroyuki Kawase	Electromechanics
Noriaki Murase	Cooperation Planning
Mariko Sekita	Interpreter

The Team met whom listed below in Tunis for the Project;

TUNISIAN SIDE

Ministry of Vocational Training and Employment (MFPE)

Mohamed Naceur Chraïti	Director of International Cooperation
Mounir Dakhli	Direction of International Cooperation
Amor Sakkej	Direction of International Cooperation

JAPANESE SIDE

Embassy of Japan in Tunisia

Toru Sudo	Second Secretary in charge of Technical Cooperation
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JICA Office in Tunisia

Toshio Namai	Resident Representative
Keiichi Takemoto	Assistant Resident Representative
Abdelmajid Belhadj Yahia	National Staff
Akemitsu Mochizuki	JICA Expert (being attached to CENAFFIF)

I. Master Plan

The Project will be implemented in accordance with the Master Plan as follows.

1. Title of the Project

The Project for the Establishment of the Sectorial Vocational Training Center for the Electric and Electronics Industry

2. Overall Goal

The overall goal is to promote the economic development in Tunisia by satisfying human resources needed by electric and electronics industry through technicians and higher technicians training.

3. Project Purpose

The purpose of the Project is to conduct technicians and higher technicians training at the Sectorial Vocational Training Center for the Electric and Electronics Industry (hereinafter referred to as "CSFPIEE")

4. Outputs

(1) Adequate curricula for four (4) courses (outline is shown in the ANNEX V) are improved continuously as follow;

- Electronics Manufacturing (BTP : Certificate for Professional Technician)
- Maintenance of Automatic Control System (BTP : Certificate for Professional Technician)
- Production Line Network Control (BTS : Certificate for Professional Higher Technician)
- Management of Manufacturing Line (BTS : Certificate for Professional Higher Technician)

(2) The competence level of instructors is upgraded in CSFPIEE.

(3) High quality technicians are graduated from CSFPIEE.

(4) Equipment is used in an efficient manner.

(5) Administrative management system in CSFPIEE is established effectively.

5. Activities

1-1. Adopt four curricula from Japanese side to Tunisian side.

1-2. Transfer training method from experts to instructors.

1-3. Create exercise book for trainer.

2-1. Identify and hire instructors for four courses

2-2. Develop training plan for instructors.

2-3. Experts transfer technology to counterparts.

3-1. Four courses are implemented effectively.

4-1. Identify suitable equipment for four courses.

4-2. Consumable material is prepared for training.

4-3. Equipment is maintained regularly.

5-1. Arrange organization effectively.

5-2. Promote trainees recruitment.

5-3. Organize assistant system for job application.II. Duration of the Project

9

9

The duration of the Japanese technical cooperation for the Project shall be five (5) years. The Team and Tunisian side understood that the starting date of the Project will be in January 2001, for the delay of construction of CSFPIEE.

III. Measures to be taken by the Japanese Government

(1) Dispatch of Long-term experts as follows;

Chief advisor (1)

Coordinator (1)

Technical experts in the fields of Electronics and Training management; Tunisian side doesn't require an expert specialized in Training Management.

Detailed activities and the number of experts will be fixed during the Implementation Study.

The Team and Tunisian side agreed that it was necessary for Experts to be capable in English for technical transfer. The Expert curriculum vitae will be transmitted before January, 2001 to the Tunisian side.

(2) Dispatch of Short-term experts

Short-term experts will be dispatched in accordance with the needs for the effective implementation of the Project after a common agreement.

(3) Training of Counterpart instructor in Japan

Tunisian counterpart instructor involved in the Project will be trained in Japan. The Team and Tunisian side basically agreed that four (4) counterparts would be trained in Japan every year, 20 instructors for 5 years in all. Tunisian side understood that the number of trainees in Japan could change on annual budgetary conditions in Japan after April, 2003. The Team and Tunisian side agreed that four (4) counterparts would be trained in Japan from April to August 2001 and 4 (four) others in the same period of 2002.

(4) Provision of Equipment

The list of main equipment which is necessary to implement the Project is shown in the ANNEX VI. On condition that the building of CSFPIEE will be completed according to schedule as shown in ANNEX VI, equipment procured in Japan to start the training courses will be supplied to CSFPIEE by September, 2001, and equipment procured in Tunisia will be supplied to CSFPIEE by August 2001.

IV. Measures to be taken by the Tunisian Government

(1) Counterparts

Assignments of a sufficient number of counterpart personnel being capable in English for technical transfer, and administrative personnel to ensure effective operation of the Project. Tunisian side agreed that four (4) counterparts will be assigned when the project starts, and eight (8) counterparts will be assigned in April, 2001. (see ANNEX VII)

Counterparts allocation will be considered that experts team can conduct at least 8 counterparts for the Project period. By the end of the Project, Tunisian side will have allocated about 30 instructors to implement each training course smoothly.

(2) Buildings and Facilities

Tunisian side will prepare necessary buildings, facilities and for the implementation of the Project, and also will provide offices and other necessary facilities for the Japanese experts. Tunisian government already have allocated sufficient budget for construction of whole buildings and facilities.

(3) Furniture and Consumable Materials

Tunisian side will provide furniture and consumable materials necessary for the implementation of the Project.

(4) Budget Allocation

Tunisian side will ensure all running expenses for the implementation of the project.

IV. Project Design Matrix (PDM)

The Team and Tunisian side reached agreement on revising the tentative PDM which is established in the preliminary study is revised. The revised PDM is shown in ANNEX I. This PDM will be further elaborated and finalized by both sides at the Implementation Study stage.

V. Plan of Operation (PO)

The tentative PO is shown in ANNEX II and III.

VI. Tentative Schedule

(1) Implementation of the Project

The tentative schedule before starting the four (4) training courses is shown in ANNEX VII.

In according to this schedule, Japanese side will execute the plan such as dispatching experts, provision of equipment and counterparts training. On the other hand, Tunisian side will complete buildings and facilities, and allocate counterparts.

(2) Implementation Study

When the Project is found viable by the Japanese Government, the Japanese Implementation Study Team will be dispatched to determine the detailed content of the technical cooperation and record it in the form of a Record of Discussion, hopefully around November 2000.

The Team and Tunisian side recomfirmed that the Implementation Study Team would be send after the confirmation that building construction has been achieved majority of whole building frame according to the construction plan.

The Team advised the conception plan of CSFPIEE and both sides determined the

Layout of each practice room. (see ANNEX VI) . According to the layout ,Tuisian side will revise the conception plan. Nevertheless, modification of the plan of Seminer Room will be submitted to technical approval of architect. The Team recommend to continue the construction process as shown in ANNEX IX.

ANNEX I	Tentative Project Design Matrix (revised)
ANNEX II	Tentative Plan of Operation (Whole Period)
ANNEX III	Tentative Annual Plan of Operation
ANNEX IV	Organization of Four (4) Training Courses (revised)
ANNEX V	Curricula of Four (4) Training Courses
ANNEX VI	List of Equipment and Layout of Training Rooms.
ANNEX VII	Tentative Schedule before Starting the Training Courses
ANNEX VIII	Construction Schedule of CSFPIEE

ANNEX I Project Design Matrix

Project Name: The Project for the Establishment of the Sectorial Vocational Training Center for the Electric and Electronics Industry in Tunisia

Project Site: The Sectorial Vocational Training Center for the Electric and Electronics Industry

03 2000

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption
Overall Goal			
Upgraded technicians fulfill employment market.	* Satisfaction level of enterprises for employment. * Employment ratio of graduates from four courses.	* Questionnaire survey for enterprises and other CSFs * Statistics of national observatory for vocational training and employment	* Human resources are employed by enterprises.
Project Purpose	(as direction of concept)		
<u>Technician training at CSFPIEE becomes the model for its operation quality in Tunisia.</u>	1. No. of trainees in CSFPIEE 2. No. of trainees dropped out in CSFPIEE 3. No. of realized days of re-training 4. No. of conventions signed with enterprises 5. No. of training days in enterprises 6. <u>Technical level of instructors</u>	1~6 Monthly report of CSFPIEE Annual report of CSFPIEE Program contract document 7 CENAFFIF evaluation	* Industrial needs for four courses exist.
Outputs	(as direction of concept)		
1. Adequate curricula for four courses are improved continuously.	1. <u>No. of improved programs</u> <u>No. of improved equipment</u>	1~3 Monthly report of CSFPIEE Annual report of CSFPIEE	* Trained instructors stayed in CSFPIEE.
2. <u>The competence level of instructors is upgraded in CSFPIEE.</u>	2. No. of <u>upgraded</u> instructors	4 Equipment inventory Operated ratio survey for provided equipment by Japan	
3. <u>High quality technicians are graduated from each training course.</u>	3. <u>No. of graduates awarded a high grade</u>		
4. <u>Equipment is used in an efficient manner.</u>	4. Condition of Equipment Frequency of maintenance and operation for equipment utility		
5. <u>Administrative management system in CSFPIEE is established effectively.</u>			
Activities	Inputs		
1 - 1 Adopt Four curricula from Japanese side to Tunisian side.	Inputs by Tunisian side	Inputs by Japanese side	
1 - 2 Transfer <u>training method</u> from experts to instructors.	1) Arrangement of personnel	1) Dispatch of experts	
1 - 3 Create exercise book for trainer.	-Counterparts, Project Manager, etc.	-Long term experts	
2 - 1 Identify and hire instructors for four courses.	-Organization of Joint Coordinating Committee	-Short term experts	
2 - 2 Develop training plan for instructors.	2) Land for buildings (at "Chemin de la Minoterie El-Omrane")	2) Provision of equipment	
2 - 3 Experts transfer technology to counterparts.	3) Building and Facilities	3) Tunisian counterparts training in Japan	
3 - 1 <u>Four courses are implemented effectively.</u>	4) Furniture and Consumable Materials		
4 - 1 Identify <u>suitable</u> equipment for four courses.	5) Budget for necessary running expense		
4 - 2 Consumable material is prepared for <u>training.</u>			
4 - 3 Equipment is maintained regularly.			
5 - 1 Arrange organization effectively.			
5 - 2 <u>Promote trainees recruitment.</u>			
5 - 3 Organize assistant system for job application.			
			Pre-condition * Necessary procedure are achieved by both government.

* Underlined parts was modified.

71

ANNEX II Plan of Operation

03 2000

Plan of Operation (Whole period)	2001				2002				2003				2004				2005						
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV			
1 – 1 Adopt four curricula from Japanese side to Tunisian side.	make					revise						review				review							
1 – 2 Transfer training method from experts to instructors.	_____																						
1 – 3 Create exercise book for trainer.		make								review													
2 – 1 Identify and hire instructors for four courses.	_____																						
2 – 2 Develop training plan for instructors.	_____				_____				_____				_____				_____						
2 – 3 Experts transfer technology to counterparts.	_____																						
3 – 1 Four courses are implemented effectively.	_____																						
4 – 1 Identify suitable equipment for four courses.	_____					_____				_____				_____				_____					
4 – 2 Consumable material is prepared for training.			_____					_____				_____				_____							
4 – 3 Equipment is maintained regularly.	_____																						
5 – 1 Arrange organization effectively.	_____							_____				_____				_____							
5 – 2 Promote trainees recruitment.			_____				_____				_____		_____				_____						
5 – 3 Organize assistant system for job application.	_____																						

I: January-March, II: April-June, III: July-September, IV: October-December

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ANNEX III Annual Plan of Operation for the First Year

03 2000

Plan of Operation	2001												
	1	2	3	4	5	6	7	8	9	10	11	12	
1 – 1 Adopt four curricula from Japanese side to Tunisian side.	_____												
			make curricula										
1 – 2 Transfer training method from experts to instructors.	_____												
1 – 3 Create exercise book for trainer.					_____								
2 – 1 Identify and hire instructors for four courses.	_____												
2 – 2 Develop training plan for instructors.	_____												
2 – 3 Experts transfer technology to counterparts.	_____												
3 – 1 Four courses are implemented effectively.													
4 – 1 Identify suitable equipment for four courses.	_____												
4 – 2 Consumable material is prepared for training.											_____		
4 – 3 Equipment is maintained regularly.									_____				
5 – 1 Arrange organization effectively.	_____												
5 – 2 Promote trainees recruitment.											_____		
5 – 3 Organize assistant system for job application.													

ORGANIZATION OF FOUR(4) TRAINING COURSES

03 2000

	20 02 Feb.	20 03 Feb.	20 03 S ep.	20 04 F eb.	20 04 S ep.	2005 Feb	2005 Sep
BTP Electronics manufacturing	20	20	20	20			
			20	20	20	20	
				20	20	20	20
					20	20	20
						20	20
BTP Maintenance of automatic control system	20	20	20	20			
			20	20	20	20	
				20	20	20	20
					20	20	20
						20	20
BTS Production line network control	20	20	20	20			
			20	20	20	20	
				20	20	20	20
					20	20	20
						20	20
BTS Manegement of manufacturing line	20	20	20	20			
			20	20	20	20	
				20	20	20	20
					20	20	20
						20	20
							20

CURRICULA

Electronics manufacturing (BTP)

	THEORY subjects	training hour		Total	Remarks
		1st grade	2nd grade		
1	Health: Hygiene and security on work place	60	60	120	
2	Technical English	60	60	120	
3	Physical education	60	60	120	
4	Management of enterprise	60	60	120	
1	Electric theory	80		80	
2	Electrostatic electromagnetic theory	80		80	
3	Electronics theory	40		40	
4	Analogue electronics circuits	80	40	120	
5	Digital electronics circuit	40	40	80	
6	Electric and electronics measurement method	80		80	
7	Automatic control theory		40	40	
8	Electrical mathematics	40		40	
9	Industrial engineering		40	40	
10	Quality control		40	40	
	total (theory)	680	440	1,120	

	PRACTICE subjects	training hour		Total	Remarks
		1st grade	2nd grade		
1	Basic usage of personal computer	80		80	
2	Basic measurement practice	80		80	
3	Basic hand work	80		80	
4	Assembling of electronics equipment	80	160	240	
5	Analogue electronics circuits practice	80	160	240	
6	Digital electronics circuit practice	80	160	240	
7	Making practice of printed board	80	160	240	
8	Drawing	80		80	
9	Electronics component technology	40		40	
10	Microcomputer practice		280	280	
1	Project work	80	80	160	
2	Factory training	160	160	320	
	total (practice)	920	1,160	2,080	

	total	1,600	1,600	3,200	
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CURRICULA**Maintenance of automatic control (BTP)**

	THEORY subjects	training hour		Total	Remarks
		1st grade	2nd grade		
1	Health: Hygiene and security on work place	60	60	120	
2	Technical English	60	60	120	
3	Physical education	60	60	120	
4	Management of enterprise	60	60	120	
1	Electric theory	80		80	
2	Electrostatic electromagnetic theory	80		80	
3	Electronics theory	40		40	
4	Analogue electronics circuits	80	40	120	
5	Digital electronics circuit	40	40	80	
6	Electric and electronics measurement method	80		80	
7	Automatic control theory		40	40	
8	Industry engineering		40	40	
9	Quality control		40	40	
10	Mechanical dynamics	40		40	
11	Mechanism	40		40	
12	Pneumatic and hydraulic engineering	40		40	
13	Electrical mathematics	40		40	
	Total (theory)	760	440	1,200	

	PRACTICE subjects	training hour		Total	Remarks
		1st grade	2nd grade		
1	Basic usage of personal computer	80		80	
2	Basic measurement practice	80		80	
3	Basic hand work	80		80	
4	Analogue electronics circuits practice	40	200	240	
5	Digital electronics circuit practice	40	200	240	
6	Machinery handiwork	80		80	
7	Sequence control circuit practice	80	80	160	
8	Electric motors (AC, DC, STEPPING)		80	80	
9	PLC control practice		160	160	
10	Practice on mechatronics		120	120	
11	Drawing	80	0	80	
12	Electronics component technology	40		40	
13	Pneumatic control practice		80	80	
1	Project work	80	80	160	
2	Factory training	160	160	320	
	Total (practice)	840	1,160	2,000	

	Total	1,600	1,600	3,200	
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CURRICULA

Production line net work control (BTS)

	THEORY subjects	training hour		Total	Remarks
		1st grade	2nd grade		
1	Health: Hygiene and security on work place	60	60	120	
2	Technical English	60	60	120	
3	Physical education	60	60	120	
4	Management of enterprise	60	60	120	
1	Electric theory	80		80	
2	Electrostatic electromagnetic theory	80		80	
3	Electronics theory	40		40	
4	Analogue electronics circuits	80	40	120	
5	Digital electronics circuit	40	40	80	
6	Electric and electronics measurement method	80		80	
7	Automatic control theory		40	40	
8	Mechanical dynamics	40		40	
9	Mechanism	40		40	
10	Industrial engineering		40	40	
11	Quality control method		40	40	
12	Electrical mathematics	40		40	
	Total(theory)	760	440	1,200	

	PRACTICE subjects	training hour		Total	Remarks
		1st grade	2nd grade		
1	Basic usage of personal computer	80		80	
2	Basic measurement practice	80		80	
3	Basic hand work	80		80	
4	Assembling of electronics equipment		120	120	
5	Analogue electronics circuits	0	160	160	
6	Digital electronics circuit practice	0	160	160	
7	PLC control practice		240	240	
8	Practice on factory automation		160	160	
9	Sequence control circuit practice	160		160	
10	Drawing	160		160	
11	Electronics component technology	40		40	
12	Computer network		80	80	
1	Project work	80	80	160	
2	Factory training	160	160	320	
	Total (practice)	840	1,160	2,000	
	Total	1,600	1,600	3,200	

CURRICULA

Management of manufacturing line (BTS)

THEORY subjects	training hour		Total	Remarks
	1st grade	2nd grade		
1 Health; Hygiene and security on work place	60	60	120	
2 Technical English	60	60	120	
3 Physical education	60	60	120	
4 Management of enterprise	60	60	120	
1 Electric theory	80		80	
2 Electrostatic electromagnetic theory	80		80	
3 Electronics theory	40		40	
4 Analogue electronics circuits	80	40	120	
5 Digital electronics circuit	40	40	80	
6 Electric and electronics measurement method	80		80	
7 Automatic control theory		40	40	
8 Industrial engineering		40	40	
9 Management production method of manufacturing		40	40	
10 Quality control method		40	40	
11 Mechanical dynamics		40	40	
12 Mechanism	40		40	
13 Pneumatic and hydraulic engineering	40		40	
14 Electrical mathematics	40		40	
Total (theory)	760	520	1, 280	
PRACTICE subjects	training hour		Total	Remarks
	1st grade	2nd grade		
1 Basic usage of personal computer	80		80	
2 Basic measurement practice	80		80	
3 Basic hand work	80		80	
4 Assembling of electronics equipment		160	160	
5 Analogue electronics circuits	40	160	200	
6 Digital electronics circuit	40	160	200	
7 Sequence control practice	80	40	120	
8 Pneumatic control practice		120	120	
9 Drawing	160		160	
10 Electronics component technology	40		40	
11 PLC control practice		80	80	
12 Practice on factory automation		120	120	
1 Project work	80	80	160	
2 Factory training	160	160	320	
Total (practice)	840	1, 080	1, 920	
Total	1, 600	1, 600	3, 200	

Detail of Curriculum

Subject: Automatic control theory

No	Contents	Hrs.
	Dynamic system	6
	Transfer function	6
	Feed Back control	7
	Analysis by frequency response	7
	Stability	7
	Logic control system	7
		40

Detail of Curriculum

Subject: Mechanical dynamics

No	Contents	Hrs.
	Motion of solid Velocity, Acceleration Linear motion Circular movement	10
	Motion and force Centripetal force Centrifugal force and Inertia force Balance of revaluating solid Momentum Collision	10
	Geometrical moment of inertia Motion of rotating solid Inertia moment Kinetic energy	10
	Oscillation Simple harmonic motion Spring-coil harmonic motion Swing of a pendulum Whirling speed	10
		40

Detail of Curriculum

Subject: Mechanism

No	Contents	Hrs.
	Basis of mechanical motion	6
	Velocity and acceleration of mechanism	6
	Conveyer device by friction	5
	Gear device	5
	Cam device	5
	Link device	5
	Belt	4
	Chain	4
		40

Detail of Curriculum

Subject: Pneumatic and hydraulic engineering

No	Contents	Hrs.
	Outline of Pneumatic and hydraulic engineering	10
	Hydraulic type	15
	Principle and characteristics	
	Instruments and compositions	
	Basic circuit	
	Maintenance	
	Trouble shooting	
	Pneumatic type	15
	Principle and characteristics	
	Instruments and compositions	
	Basic circuit	
	Maintenance	
	Trouble shooting	
		40

Detail of Curriculum

Subject: Basic usage of personal computer

No	Contents	Hrs.
	Outline Basic structure of computer Data expressions	15
	Hardware CPU Memory system Output system	15
	Software operating Operating system Applications	40
	LAN	10
		80

Detail of Curriculum

Subject: Machinery handiwork

No	Contents	Hrs.
	Hand finishing Grinder Boring machine Filing Bending	30
	Lathe work Handling Kinds of cutting tools and usage basic work Manufacturing work	25
	Milling work Handling Kinds of cutting tools and usage Basic work Manufacturing work	25
		80

Detail of Curriculum

Subject: PLC control practice

No	Contents	Hrs.
	Outline of PLC Characteristics Construction Basic operation	20
	Programming Basic command Time chart Ladder diagram Assignment Programming exercise	40
	Assembling of circuit Basic circuit Application	60
	Inverter control by PLC	30
	Servo controll by PLC	30
	Pneumatic controll by PLC	60
		240

Detail of Curriculum

Subject: Practice on mechatronics

No	Contents	Hrs.
	System design Controller Sensors Mechanisms Actuator Electric motor Pneumatic system Hydraulic system	40
	Making up of mechanism	10
	Assembling of actuator	10
	Installation of sensor	10
	Setting of controller	10
	Programming	20
	System of driving	10
	Evaluation	10
		120

Detail of Curriculum

Subject: Practice on network of computer system

No	Contents	Hrs.
	LAN	
	Outline	6
	Transmit media	4
	Protocol	4
	Software for Network	
	Basic software	10
	Security	10
	Network In manufacturing system	
	Client and server system	6
	RS-232c	10
	GP-IB	6
	Ethernet	6
	Management	
	Security countermeasure	6
	Network management	6
	Maintenance	6
		80

Detail of Curriculum

Subject: Practice on factory automation

No	Contents	Hrs.
	Composition of System	5
	Outline of system	5
	Hardware	10
	Software	10
	Operating and driving of system	15
	Manufacturing cell	15
	Assembling cell	15
	Inspections cell	15
	Store cell	15
	Conveyance system	15
	Driving of system	15
	Manufacturing process and maintenance control	5
	Schedule of manufacturing	5
	Manufacturing process control	5
	Trouble shooting	5
	Maintenance control of system	5
		160

Detail of Curriculum

ANNEX V

03 2000

Subject: Electronics theory

No	Contents	Hrs.
1	Basic of semiconductor Electron Crystal form and energy-band	6
2	PN junction and semiconductor structure and character	6
3	Semiconductor elements Diode Transistor FET IC Others	18
4	Tube Electron radiation Tube	4
5	Others Electric discharge CRT and Laser	6
Total		40

Detail of Curriculum

ANNEX V

03 2000

Subject: Analogue electronics circuits

No	Contents	Hrs.
1	Amplifier circuits GND circuits of transistor Bias circuits and load line Coupling method Equivalence circuits Negative feedback circuits	40
2	Oscillator circuit LC oscillator circuits Xtal oscillator circuits RC oscillator circuits	16
3	Modulation and Demodulation circuits Amplitude modulation and detector Frequency modulation and detector	8
4	Power electronics circuits Power amplifier circuits Rectifier circuits Inverter and converter circuits	22
5	Operational amplifier Characteristic of operational amplifier Inverting amplifier circuits Non-inverting amplifier circuit Other circuits	28
6	others	6
Total		120

Detail of Curriculum

ANNEX V

03 2000

Subject: Digital electronics circuit

No	Contents	Hrs.
1	Numbers conversion and cord	6
2	Logic circuits Logic and logic circuits Combination logic circuits Boolean and Karunou map Combination logic circuits design	18
3	Digital IC Chracterristic of each digital IC	10
4	Flip flops RS-FF, JK-FF, D-FF, T-FF Sequential logic circuits	16
5	Counters asynchronous counter synchronous counter	16
6	Other digital circuits Oscillator circuits Wave form circuits Display circuits	14
	Total	80

Detail of Curriculum

ANNEX V

03 2000

Subject: Basic hand work

No	Contents	Hrs.
1	Soldering work Theory of soldering Wire soldering Terminal soldering Printed board soldering Parts mounting method	40
2	Fileing works	8
3	Boring works	8
4	Welding works	8
5	Chassis works Bowring Cutting Bending Finising	16
	Total	80

Detail of Curriculum

ANNEX V

03 2000

Subject: Analogue electronics circuits practice

No	Contents	Hrs.
1	Characteristic of semiconductor elements Diode Transistor FET	20
2	Transistor circuits Bias circuits CR coupling circuits SEPP Negative feed-back circuits Oscillator circuits	40
3	FET Amplifier circuits	20
4	Operational amplifier circuits Inverting amplifier circuits Non-inverting amplifier circuit Other circuits	40
5	DC power supply circuits Rectifier circuits Stabilizer circuit	40
6	Power electronics	40
7	Analog circuit simulation	40
	Total	240

Detail of Curriculum

ANNEX V

03 2000

Subject: Digital electronics circuit practice

No	Contents	Hrs.
1	Basic logic circuits Basic logic circuit and truth table Basic logic IC Combination circuits design	40
2	Flip flops Timing chart Trigger and logical input	40
3	Counters asynchronous counter and timing chart synchronous counter and timing chart	40
4	Other digital circuits Display circuits Shift resistor Oscillator Wave form circuits A/D, D/A converter	40
5	Digital simulation Schematic Simulation	40
6	PLD (Programmable Logic Device) Small model (GAL or PAL) Large model (FPGA)	40
	Total	240

Detail of Curriculum

ANNEX V

03 2000

Subject: Electric mathematics

No	Contents	Hrs.
1	Basic curicuration of electronics mathematics exponent log a complex number	10
2	Series	6
3	Trigonometric function	6
4	Vector	6
5	Matrix and determinant	4
6	Differential calculus and integral calculus	8
	Total	40

Detail of Curriculum

ANNEX V

03 2000

Subject: Making practice of printed board

No	Contents	Hrs.
1	Principle of making printed board	2
2	Handring method Art-work Making of resist Etching Finishing work	38
3	Photo etching method Making of photo film Making of photo-resist	40
4	Silk- screen method Making of screen Application of photosensitizer Printing screen Printing ink	40
5	Making of art-work by CAD system How to use CAD system Manual wiring method Auto wiring method	120
Total		240

Detail of Curriculum

ANNEX V

03 2000

Subject: **Assembling of electronics equipment**

No	Contents	Hrs.
1	Basic assembling work Harness work Printed board assemble work Chassis assembly work Wiring works Adjustment work Finishing work	40
2	Amplifire equipment assembling work Drawing work (circuit, chassis) Printed board work Assembling work Chassis making work Adjustment work Finishing work	80
3	Digital frequency counter assembling work Drawing work (circuit, chassis) Printed board work Assembling work Chassis making work Adjustment work Finishing work	80
4	Skill evalution work Assembling samthing according to specification	40
Total		240

Detail of Curriculum

ANNEX V

03 2000

Subject: Electronics components technology

No	Contents	Hrs.
1	Conductor	6
2	Insulator	6
3	Resistor	8
4	Capacitor	4
5	Inductor	2
6	Semiconductor	2
7	Sensor Sensor element Sensor component	12
	Total	40

Detail of Curriculum

ANNEX V

03 2000

Subject: Microcomputer practice

No	Contents	Hrs.
1	Hardware of microcomputer CPU Oscillator and reset circuit Memory (RAM, ROM) Memory map and aAddress decoder I/O map and I/O IC Peripherals	40
2	Software of microcomputer Basic command Flowchart Blanch Blanch with condition Subrutine Interupt	40
3	Interface LED and SW circuit Moter drive circuit Sensor cercuit	40
4	Programing practice Hand assembling Assembla programing	40
5	One chip microcomputer (Micro contoler) Hardware on one chip microcomputer Software on one chip microcomputer	40
6	Application of one chip microcomputer Making of self running robot	80
Total		280

Detail of Curriculum

ANNEX V

03 2000

Subject: Management production method of manufacturing

No	Contents	Hrs.
1	Producton plan and manegement production method	6
2	Day's program [schedule]	16
3	Progress [stage] of work plan	18
	Total	40

Detail of Carriculum

ANNEX V
03 2000

Subject: Electric theory

No	Contents	Hrs.
1	DC circuit	4
2	Complex number	4
3	Sinusoidal Alternating current circuit	16
4	Symbolic method	16
5	Theorems(Thevenin's theorem etc)	10
6	Linear network	10
7	Single phase and three phase AC circuit	20
		80

Detail of Carriculum

Subject: Introduction of Industrial engineering

No	Contents	Hrs.
1	Introduction	2
2	Form of management	2
3	Form of management about enterprises	2
4	Formation of enterprises	2
5	Factory Management	2
6	Basic plan of production	2
7	Production control	2
8	Management of the progress of work	2
9	Work Study	2
10	Management of equipments	2
11	Management of transport	2
12	Quality control	2
13	Management of materials	2
14	Management of circumstances	2
15	Personal management	2
16	Management of financial affairs	2

Detail of Carriculum

Subject: Quality Control

No	Contents	Hrs.
1	Purpose and meaning of quality control	4
2	Deviation and special quality	4
3	Standard deviation	4
4	Notion of statistic quality control	4
5	Method of statistic quality control	8
6	Random Sampling	4
7	Operations research	4
8	practice	4
		40

Detail of Carriculum

Subject: Method of measuring

No	Contents	Hrs.
1	Instrumentation	16
2	Electric meter	22
3	Instrumentation of electric and magnetism	18
4	Electronic measuring instruments	24
		80

Detail of Carriculum

Subject: Electromagnetics

No	Contents	Hrs.
1	Electric charge and electric field	16
2	Capacitance	14
3	Dielectric	12
4	Current and resistance	12
5	Magnetic field	14
6	Magnetic material	12
		80

Detail of Carriculum

Subject: Basic practice on measurement

No	Contents	Hrs.
1	How to use of voltmeter	8
2	How to use of ampere meter	8
3	How to use of resister	4
4	How to use of circuit tester	4
5	How to use of oscilloscope	8
6	How to use of Wheatstone bridge	10
7	How to use of kelvin double bridge	8
8	How to use of Procision DC Potentio meters	6
9	Proof reading of DC volt meter and DC ampere me	4
10	Proof reading of AC volt meter and AC ampere me	4
11	Measurement of electrical power (AC, DC)	10
12	Measurement of grounding resistance	4
13	Measurement of insulation resistance	4
		80

Detail of Carriculum

Subject: Drafting

No	Contents	Hrs.
1	Basic of drafting	48
2	Elements of Machines	32
3	Electric machines	16
4	Electrical facilities	40
5	Apparatus of electronics	24
		160

Equipments list

No. 1/4

Related curriculum: Basic measurement practice

Room: L, 160m²

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
1	Carbon—film resistor	10Ω, 1.5yen	100			TUNISIE
	Carbon—film resistor	100Ω, 1.5yen	100			TUNISIE
	Carbon—film resistor	1, 000Ω, 1.5yen	100			TUNISIE
	Carbon—film resistor	10, 000Ω, 1.5yen	100			TUNISIE
	Carbon—film resistor	100, 000Ω, 1.5yen	100			TUNISIE
	Carbon—film resistor	1, 000, 000Ω, 1.5yen	100			TUNISIE
2	Standard resistance	0.01Ω, 2792-02, YEW ©	1			
	Standard resistance	1. 0Ω, 2792-04, YEW ©	1			
	Standard resistance	10Ω, 2792-05, YEW ©	1			
	Standard resistance	100Ω, 2792-06, YEW ©	1			
	Standard resistance	1kΩ, 2792-07, YEW ©	1			
	Standard resistance	10kΩ, 2792-08, YEW ©	1			
3	Decade Resistance Box	0. 1~111, 111Ω, 2786-01, YEW©	4			
4			0			
5			0			
6	Slide Resistors(one—bobbin)	600Ω/0. 5A, 2791-03, YEW ©	4			
	Slide Resistors(one—bobbin)	170Ω/1A, 2791-05, YEW ©	6			
	Slide Resistors(one—bobbin)	39Ω/2A, 2791-08, YEW ©	2			
	Slide Resistors(one—bobbin)	10Ω/2A, 2791-10, YEW ©	2			
	Slide Resistors(one—bobbin)	4. 7Ω/6A, 2791-12, YEW ©	2			
7	Slide Resistors(one—bobbin)	DW-5-7, 216/54Ω, 1. 5/3A, YAMABISI ©	2			
8	Electric lamp(Socket attached)	1. 5V	10			
9	Electric lamp(Socket attached)	2. 5V	10			
Total						

Equipments list

No. 2/4

Room:

Related curriculum: Basic measurement practice

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
10	Diode	T87C, 1.5yen	10			
11	Electrolytic capacitor	3.6yen	10			
12	Electronic Galvanometer	YEW 2707-1 ©	2			
13	Electronic Magnetic Contact	12V,MY4N	10			
14	Electronic Magnetic Contact	24V,MY4N	10			
15	Dry battery	5M-5H3V, National,	1			
16	Clamp Device	YEW 2754 ©	1			
17	Micro meter	MITUTOYO MDC-50	1			
18	Scale	Fuji, EA720YA100, 1,150yen	2			
19	Circuit tester	YEW 3201-10 ©	1			
20	Osillo scope	SONY,TDS220,(100MHz,Digital, 2chanel)	1			
21	Portable Wheatstone Bridge	YEW 2755, 1Ω~10MΩ ©	1			
22	Portable Double Bridge	YEW 2769, 1mΩ~110Ω ©	1			
23	Precision DC Potentiometers	YEW 2722, 1.000mV ~ 1611.1V ©	1			
24	Signal generator	IWATSU	1			
25	Single-phase Watthour met	HIOKI 3168	2			
26	Direct-current voltmeter	YEW 2011-39, 0.5class(3/10/30/100V)	4			
27	Direct-current voltmeter	YEW 2011-38, 0.5class(0.3/1/3/10V)	2			
28	Direct-current Amperemeter	YEW 2011-33, 0.5class(0.1/0.3/1/3mA)	1			
29	Direct-current Amperemeter	YEW 2011-35, 0.5class(10/30/100/300mA)	1			
"	Direct-current Amperemeter	YEW 2011-36, 0.5class(0.1/0.3/1/3A)	3			
30	Alternating-current voltmeter	YEW 2013-17, 0.5class(75/150V)	1			
31	Alternating-current voltmeter	YEW 2013-18, 0.5class(150/300V)	2			
Total						

Equipments list

No. 3/4

Related curriculum: Basic measurement practice

Room:

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
32	Alternating-current Ampere meter	YEW 2013-12, 0.5class(0.5/1/2/5A) ◎	1			
33	Alternating-current Ampere meter	YEW 2013-13, 0.5class(2/5/10/20A) ◎	2			
34	Standard Cell	YEW 2749-01 ◎	1			
35			0			
36	DC Standard Voltage Current Supply	YEW 2553, (0-10mV-10V, 0-100mA) ◎	2			
37	AC Standard Voltage Current Supply	YEW 2558, (0-100mV-1000V, 0-100mA-50A) ◎	1			
38	Electric Lamp	100W,350yen	1			
39	Electric Lamp	60W ,350yen	1			
40	Electric Lamp	40W,350yen	1			
41	Switch	1P	2			
42	Knife switch	National BEP9125A, 2P15	6			
43	Electric Heater	300W	1			
44	Single-phase Wattmeter	YEW 2041-02, 0.5class(120/200V, 1/5A) ◎	2			
45	Three-phase Wattmeter	YEW 2042, 0.5class ◎	1			
46	Digital power meter	YEW 2536-10, DC/AC ◎	1			
47	DC, stabilized power-supply	KENWOOD PS60-6(0~100V, 6A) ◎	1			
48	Slidac	YOKOYAMA RSC-5, (0~200V, 5A)	6			
49	Condenser	100V, 50 μ F, 1 ϕ	1			
50	Mutual Inductance	YEW 06-6368-7081, DC/AC ◎	1			
51	Electrical Soldering iron	HOZAN HS-23, 100V 20W	1			
52	Electrical Soldering iron	HOZAN HS-58, 100V 60W	1			
53	Earth Tester	YEW 3235-01 ◎	2			
54	Earth Bar	ϕ 20 \times 1m	5			
Total						

Equipments list

No. 4/4

Related curriculum: Basic measurement practice

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference	
				Unit price	Total		
55	Tape measure	UCHIDA 883-0650, 50m,	1			Room:	
56	Hammer(big size)	Fuji EA575BP670	1				
57	Insulation Resistance meter	YEW 2406A-21, (500V/1000MΩ, Battery type)Ⓞ	2				
58	Insulation Resistance meter	YEW 2406A-21, (500V/1000MΩ, Dynamo type)	1				
59	Thermo meter	HOZAN H-762(0-500°C)	1				
60	Lux meter	Fuji EA 712A,	2				
62	Slide caliper	Fuji EA 725A,	2				
61	Scale	Fuji EA 720YA100,	6				
63	Scale(right angle)	Fuji EA 720WA30,	6				
64	Digital Multimeters	YEW 7562-01	1				
65	Shelf	UCHIDA 225-1020, 1200W×400D×880H, 4p	4				TUNISIE
66	Book shelf	UCHIDA c300-2750, 1500W×400D×880H, 4p	4				TUNISIE
67	Base of Book shelf	UCHIDA a300-2664,	4				TUNISIE
68	Desk of experimentation	KOKUYO, KT-52	8				TUNISIE
69	Chair for experimentation	KOKUYO, CR-F2	24			TUNISIE	
70	Desk	KOKUYO	1			TUNISIE	
71	Side Desk	KOKUYO	1			TUNISIE	
72	Tool Box	HOZAN B54B	24			TUNISIE	
73	Cutting plier	HOZAN 185/13mm	48				
74	Base of soldering iron	HOZAN C1142	2				
75	Portable standard AC Ammeters & Voltmeters	YEW 2014-00 Ⓞ	2				
76	Receptacle	National	30				
Total						0	

Equipments list

ANNEX VI

0.3 2000

PLC control practice workshop

Related curriculum: PLC control practice

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
	Personal computer		10			Room:A
	Printer	A4,Lazer	10			
	PLC basic system	CPU	20			
		I/O control box				
		Operation panel				
		Input unit, Output unit				
		Input switch, sensors				
		counter unit	5			
		Lights, Induction motor, Conveyer set				
		Programming software	10			
	Inverter control set	A/D, D/A converter, Inverter unit Inverter Mechanism set, Measuring instruments	3			
	Servo control set	Position control unit Servo controller Electronic servo motor, Measuring instruments	3			
	PLC Link set		1			
Total						

Equipments list

ANNEX VI
03 2000

Personal computer laboatory

Related curriculum: Basic usage of personal computer, Computer network

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
	Server	CPU: Display:	1			Room:L
	Personal Computer	CPU: Display:	22			
	Printer	Inkjettype A3paper	1			
		Lazer type A3paper	2			
	Software	Office(wordprocesser, Table calculating)	23			
		Visual Basic	23			
	LAN device		1			
	Projector	min1024*768 Screen	1			
	(Computer desk)					
	(Screen)					
	(White board)					
		Total			0	

Equipments list

Machinery workshop, Handiwork workshop

Related curriculum: Machinery handiwork

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
						Room:A
	Lathe	Center distance:min600mm	1			2kW 3φ 1,000kg
	Milling machine	min200*300mm	1			2kW 3φ 1,500kg
	Boring machine	φ 13hole Vertical movement:100mm	2			0.3kW 30kg
	Grinder	φ 300*32	2			0.75kW
	Shearing machine	span500mm	1			
	Bending machine	span500mm	1			
	Hand finishing tool	Hack saw, filing vice and another hand finishing tool	24			
	(Working table)	800*1800mm	15			
	(White board)		2			Compressed air
	(Rack(Shelf))		2			supply
	(Tool box)		3			
Total						

Equipments list

Pneumatic control workshop

Related curriculum: Pneumatic control practice

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
	Pneumatic training system	Board, pneumatic parts, (Distributor, Valve with pushbutton actuator, Valve with selector switch, Pressure gauge, Roller lever valve, Pneumatic valve, Shuttle valve etc, Single acting cylinder, Double-acting cylinder, Manifold, Connectors) Sensors, Limit switch Optical display Pneumatic electrical converter Simulation software	5			Room:A Compressed air supply
	(Rack(Shelf)) (Tool box) (Rack+Book shelf)					
		Total				

Equipments list

Mechatronic practice workshop

Related curriculum: Practice on mechatronics

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
						0 Room:A
	Controller	Personal computer system Terminal I/O box:16/16 Isolated I/O board	4			Compressed air supply
	Sensor	Photo electric sensor Magnetic sensor Ultrasonic sensor Color sensor Rotary encoder	4			
	Actuator	Electric motor system(Induction,Reversible,Stepping,Servo) Pneumatic cylinder(Fix type, Clevis, Rotary type) Robot module(Pneumatic type, SCARA type)	4			
	Mechanism	Mechanism system Feed-screw Spur gear, Worm-gear, Plate cam, Geneva Crank, Lever-slider, Toggle, Index drive, Straight-slide-table, Belt-conveyer Rotary-table	4			
	Working device	(Working table), Magnetic fixture	4			
		Total				

Equipments list

Factory automation workshop

Related curriculum: Practice on factory automation, PLC control practice

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
	Factory automation system					Room:A
	Machining cell	Boring machine, Vice, Articulated robot PLC, PT, PC	1			
	Assembling cell	Scara robot, Parts feeder, PLC, PT, PC	1			
	Inspection cell	CCD camera, Image processing device Pallets feeder, PLC, PT, PC	1			
	Warehouse cell	Stocker crane, Warehouse PLC, PT, PC	1			
	Conveyance system	Free flow type, Pallets	1			
	Host controller	PLC, PT, PC Production management software	1			
	PLC-LAN	PLC network	1			Compressed air supply
		Total				

ANNEX VI
03 2000

Equipments list

PLC control practice workshop

Related curriculum: PLC control practice

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
	Personal computer		10			Room:A
	Printer	A4,Lazer	10			
	PLC basic system	CPU	20			
		I/O control box				
		Operation panel				
		Input unit, Output unit				
		Input switch, sensors				
		counter unit	5			
		Lights, Induction motor, Conveyer set				
		Programing software	10			
	Inverter control set	A/D, D/A converter, Inverter unit	3			
		Inverter				
		Mechanism set, Measuring instruments				
	Servo control set	Position control unit	3			
		Servo controller				
		Electronic servo motor, Measuring instruments				
	PLC Link set		1			
Total						

Equipments list

Project work laboratory (× 3)

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
1	Computer	CPU pentium III 500MHz, RAM 128Mbytes, HD 8.4Gbytes CD ROM, Multi media, Keyboard, Mouse	2			
2	Monitor	17inch, 1024*768	2			
3	PLC		1			
4	Digital multimeter	DCV 200mV to 1000V, ACV 200mV to 1000V DCA 200 μ A to 10A, ACA 200 μ A to 10A Frequency 0.2 to 10MHz, Input impedance 10MΩ Power supply: 230V 50Hz	2			
5	Oscilloscope	100MHz	2			
6	Soldering iron	With temperature control	2			
7	Scanner	A4	1			
8	UPS		1			
9	Mini bowing machine	Drill dimation 0.5 to 6mm,	1			
10	Microcomputer experimental equipmer	Z80, Monitor ROM, Key data input type, Monitor ROM RAM 32Kbyts, Address and data display, RS-232C	1			
11	ROM writer (Programmer)	EPROM and EEPROM, Keyboard, LCD display, RC-232C	1			
12	OS	Windows 2000	2			
13	Application program	OR CAD	1			
14	Application program	P Spice	1			
15	Application program	Office pro	2			
16	Application soft wear	C++	1		0	
		Total				

Equipments list

Analog electronics laboratory (× 2)

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
1	Oscilloscope	100MHz	11			Room:
2	DC regulated power supply	0 to ±30v 1A, 5v 3A	21			
3	Digital multimeter	DCV 200mV to 1000V, ACV 200mV to 1000V DCA 200 μA to 10A, ACA 200 μA to 10A Frequency 0.2 to 10MHz, Input impedance 10MΩ Power supply: 230V 50Hz	21			
4	Multi meter	ACV, DCV, DA, Ohm, Power: battery	21			
5	Oscillator	0.2Hz to 2Mhz, sin wave, triangle wave, square wave	11			
6	Electronics device and circuit experim	PN junction, Characteristics of diode, Full wave rectifier Leveling filter, Zener diode, SCR, Transistor, FET, Amplifier circuits, Oscillators, Multivibrator, etc.	11			
7	Operational amplifire circuit experimen	Inverting amplifire, Noninverting amplifire, Adding amplifire Substracting circuit, Integrating amplifire, etc	11			
8	Bread boad	Large size	30			
9	LCR meter		5			
Total						0

Equipments list

Digital electronics laboratory (× 2)

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
1	Digital storage oscilloscope	100MHz	11			Room:
2	DC regulated power supply	0 to ±30v 1A, 5v 3A	21			
3	Digital multimeter	DCV 200mV to 1000V, ACV 200mV to 1000V DCA 200 μA to 10A, ACA 200 μA to 10A Frequency 0.2 to 10MHz, Input impedance 10MΩ Power supply: 230V 50Hz	11			
4	Multi meter	ACV, DCV, DA, Ohm, Power: battery	21			
5	Oscillator	0.2Hz to 2Mhz, sin wave, triangle wave, square wave	11			
6	Bread board	Large size	30			
7	Digital electronics experiential equipment	Boolean algebra, Combination logic circuits, Sequential logic circuit, Time differed registers Decoder, 7segments LED, Adder, Multiplexers, demultiplexers Counters, Input data SWs, Output LEDs, Osc circuit, etc	11			
8	Level checker	TTL	25			
		Total				0

Equipments list

Assembling laboratory (× 2)

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
1	Soldering iron	With temperature control	25			Weller WS50 Room:
2	Mini bowing machine	Drill dimension 0.5 to 6mm,	5			
3	Desoldering machine	Vacuum type	11			
4	Digital multimeter	DCV, ACV, DCA, OHM	21			
5	Vise	for printed board	21			
6	vise	100mm	5			
7	Solder pot		1			
Total						0

Equipments list

Printed circuit board laboratory

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
1	CAD system	For printed board circuit pattern	21			0 Room:
2	Drying machine	Max 200°C, cubic contents 500*400*300	1			
3	Drier	600w (same as hair drier)	5			
4	Film camera	Film size A4, Magnifications 4, with lamps	1			
5	Printed board cutter	Cutting width 300mm	2			
6	Printing system for PCB	Ultraviolet rays lamps, Timer 30min, Vacuum type Both faces type, Printed board size A4	2			
7	Printing system for silk screen	Ultraviolet rays lamps, Timer 30min, Vacuum type Printing size A3	2			
8	Silk screen process printing equipment	A3, with sukeyzi	1			
9	Etching machine		1			
10	Etching bucket	With air pump	5			
Total						0

Equipments list

Microprocessor laboratory

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
1	Microcomputer experimental equipmen	8085, Monitor ROM, Key data input type, Monitor ROM	21		0	Room:
2	Microcomputer load experimental equi	RAM 32Kbyts, Address and data display, RS-232C	21			
3	Logic analyzer	LEDs, Switches, 7 segments LEDs, Buzzer, Small motor	5			
4	DC power supply	16ch	21			
5	Digital multimeter	5V 1A	21			
		DCV, ACV, DCA, OHM				
Total					0	

Equipments list

Seminer room

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
1	Computer	CPU pentium III, RAM 128Mbytes, HD 9Gbytes, CD ROM	1		0	Room:
2	Monitor	15inch high quality	1			
3	Mouse		1			
4	OS	Windows 2000	1			
5	Application program	Office professional	1			
6	Projector	High quality, Video signal input, RGB input, Ceiling type	1			
7	Projector screen		1			
8	VTR	Digital	1			
9	Tuner	For TV signal	1			
10	Replacer for projector	2 inputs 1 output	1			
11	Amplifier	Stereo, 10w, 4 AUX inputs, 2 mike input	1			
12	Speaker	10w	2			
13	Cassette recorder	Stereo	1			
14	Wireless mike receiver	2ch,FM	1			
15	Wireless microphone	FM	2			
16	Microphone		2			
17	Mike stand	Stand type	1			
18	Mike stand	Table type	1			
	Consol desk (cabinet)		1			
	Projecter setting expenses					
Total					0	

Equipments list

Library

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
	Computer	CPU pentium III, RAM 128Mbytes, HD 9Gbytes, CD ROM	2		0	Room:
	Monitor	17inch high quality	2			
	Modem card		2			
	OS	Windows 2000	2			
	Application program	Internet explorer (Included Windows 2000)	2			
	Application program	Outlook (Included Windows 2000)	2			
		Total			0	

Equipments list

No. 1/2

Related curriculum: Practice on Electric Machines

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
1	DC stabilized power-supply	KIKUSUI('+12V~-12V)	1			Room: L 120m ²
2	DC motor	NIHON SERVO MD100S, 24V	10			
3	Coupling	MIKI CPL20-5-6	5			
4	Phase-rotation meter	HIOKI 3126	5			
5	Strobo scope(r. P. M)	HIOKI 3404	2			
6	Power-factor meter	YEW 2039	2			
7	Knife	MARVEL	5			
8	Digital multi meter	HEWLETT PACKARD HP-34401A	2			
9	Induction Regulator	FUJI, KVR-305-1 ⊙	1			
10	Trans Former	FUJI, KCT-1φ ⊙	3			
11	Contrivance for training of Synchronous motors	TODENSHA MG-3018-2 ⊙	1			
12	Shelf	UCHIDA 225-1020, 1200W×1800H×450D, 4P.34, 600yen	4			TUNISIE
13	Book shelf	UCHIDA c300-2664, 52, 000yen	4			TUNISIE
14	Base of Book shelf	UCHIDA a300-2664, 5, 400yen	4			TUNISIE
15	Desk of experimentation	KOKUYO FW-KTB693N, 104, 500yen	8			TUNISIE
16	Side desk	KOKUYO SD-S9E3, 29, 700yen	1			TUNISIE
17	Chair for experimentation	KOKUYO CR-F2, 6, 800yen	21			TUNISIE
18	Desk	KOKUYO SD-S5F, 32, 500yen	1			TUNISIE
Total						0

PT

Equipments list

No. 2/2

Related curriculum: Practice on Electric machines

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
19	Direct-current volt meter	YEW 2011-39, 0.5class(3/10/30/100V) *	1			Room:
20	Direct-current ampere meter	YEW 2011-36, 0.5class(0.1/0.3/1/3A) *	1			
21	Single-phase Wattmeter	YEW 2041-02, 0.5class(120/240V, 1/5A) *	5			
22	Alternating-current volt meter	YEW 2013-17, 0.5class(75/150V) *	4			
23	Alternating-current volt meter	YEW 2013-18, 0.5class(150/300V) *	1			
24	Alternating-current ampere meter	YEW 2013-12, 0.5class(0.5/1/2/5A) *	4			
25	Alternating-current ampere meter	YEW 2013-13, 0.5class(2/5/10/20A) *	1			
26	Portable power-factor meter	YEW 2039-02, 0.5class(120V,1/5A) *	4			
27	Portable frequency meter	YEW 2038-32, 0.5class(20~100Hz) *	2			
28	Single-phase volt slider	YAMABISHI S-260-10 Y-3 (200V,10A) *	4			
29	Three-phase volt slider	YAMABISHI S3P-240-10 Y-7 (200V,10A) *	1			
30	Slide Resistors(one-bobbin)	YEW 2791-03 (0.5A/600Ω) *	4			
31	Slide Resistors(one-bobbin)	YEW 2791-05 (1.0A/170Ω) *	4			
32	Analogue- Circuit tester	SANWA YX-360TRN(13.398DINARS,SOU ISSI, in TUNIS) *	5			
Total						0

Equipments list

No. 1/1

Related curriculum: Drawing

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
1	Drawing instrument	Drawing set : No.1~No. 4, UCHIDA ICP set, 800-595	21			Room: L 120m ²
2	Board	"	21			
3	Base	"	21			
4	Chair	"	21			
5	Tool set for drawing	UCHIDA A730-7000	21			
6	Whisk Broom	UCHIDA 825-0200	21			
7	PLUS shields(stainless steel)	UCHIDA 8200-0000	21			
8	Ruler(circle)	UCHIDA 843-0101	21			
9	Drafting tape	UCHIDA D-12	21			
10	Eraser	UCHIDA G855-0050	21			
11	Sharp pencil	UCHIDA F848-2013	21			
	"	UCHIDA F848-2015	21			
	"	UCHIDA F848-2017	21			
12	Spare of lead	UCHIDA A826-0700	21			
	"	UCHIDA B826-0100	21			
	"	UCHIDA C826-0300	21			
13	Side wagon	UCHIDA 872-0210	21			
14	Map cabinet	UCHIDA 873-5110	1			
15	Base of map cabinet	UCHIDA 873-8211	1			
16	Desk	UCHIDA SD-S5F, 32,500yen	1			TUNISIE
17	Side desk	UCHIDA SD-S9E3, 29,700yen	1			TUNISIE
18	Tenplate (number)	UCHIDA 843-1042 , No. 42	21			
19	Tenplate (alphabet)	UCHIDA 843-1014 , No. 4-S	21			
		Total				

Equipments list

No. 1/5

Related curriculum: Sequence control practice

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
1						0 Room: L
2	Transistor-Transistor Logic IC(AND)		0			
3	Transistor-Transistor Logic IC(OR)		0			
4	Transistor-Transistor Logic IC(NOT)		0			
5	Transistor-Transistor Logic IC(NAND)		0			
6	Proto-board		0			
7	DC stabilized power-supply	PL-18-5 MATUDA	0			
8	Carbon-film resistor	380Ω	0			
9	Carbon-film resistor	500Ω	0			
10	Light Emitting Diode(LED)	RED	0			
11	Light Emitting Diode(LED)	GREEN	0			
12	Push Button Switch(PBS)	RED, Combined-Contact Fuji	24			
13	Push Button Switch(PBS)	GREEN, Combined-Contact Fuji	24			
14	Push Button Switch(PBS)	BLACK, Combined-Contact Fuji	24			
15	Signal Lamp	White, 200V Fuji	24			
16	Signal Lamp	RED, 200V Fuji	24			
17	Signal Lamp	ORANGE, 200V Fuji	24			
18	Signal Lamp	GREEN, 200V Fuji	24			
19	Electro Magnetic Switch	THR, 5.5kw, 200V, 2a-2b National ◎	72			
20	Fuse	Cylinder type	48			
21	Fuse holder	F7140, 30A	48			
22	Motor breaker	30A, National ◎	24			
23	Analogue Circuit tester	3030 HIOKI, 12,240yen(→SANWA, YX-360TRN, 13,398Dinars, SOUISSI, in TUNIS)	24			
Total						

Equipments list

No. 2/5

Related curriculum: Sequence control practice

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference	
				Unit price	Total		
24	Induction Motor(3 ϕ)	0.75kw, Mitubisi	◎ 2			Room: L	
25	Torque driver	XOFT-D, TOUNITI	◎ 5				
26	Wire Stripper	3000B/C, BESSEL	◎ 24				
27	Driver	'+, #1, BESSEL, Unit price 710 yen	0			→No. 81	
28	Driver	'-, #1, BESSEL, Unit price 710 yen	0			→No. 81	
29	Driver	'+, #3, BESSEL, Unit price 710 yen	0			→No. 81	
30	Driver	'-, #3, BESSEL, Unit price 710 yen	0			→No. 81	
	Vinyl Insulation(IV wire)	5.5mm * mm, 100m	◎ 3				
31	Vinyl Insulation(IV wire)	1.25mm * mm, 100m	◎ 3				
32	Steel board	600 × 450 × 1mm, TFL-CP, 5Y 7/1,	◎ 24				
	Steel board(Net type)	" " , TFL-RL	0			→ No. 65	
33	Drilling machine	KRDG-420(170kg),KIRA	◎ 1				
34	Grinder	GBT5,HITACHI,	◎ 1				
35	Pipe vise	1201VL,REKKIS	1				
36	File	Rude touches,EA521VP-200A,FUJI	◎ 24				
37	File	Finishing touches, "" ""	◎ 24				
38	File	Half-moon folm,EA521VM150C,	◎ 24				
39	File	Small circle folm,6 ϕ , EA521VM150F,	◎ 24				
40	Remer	MIEC-3, OKAZAKI	◎ 11				
41	Click Ball	FUJI	11				
42	Pointer	SPLL	24				
43	Hammer	HN-15, Unit price 1890 yen	24				
44	Needle	SK-KW, Unit price 1500 yen	24				
Total						0	

Equipments list

No. 3/5

Related curriculum: Sequence control practice

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference	
				Unit price	Total		
45	Scale	1m	6			Room: →No. 790 →No. 790	
46	Current transformer	5/30A G2MR, HIOKI ◎	48				
47	Ammeter(control panel)	1.5class,50A,5A 2013 20	24				
	Voltmeter (control panel)	150V 2013 21	24				
48	Ammeter Change-over switch(AS)	30A,AH30-P2A,FUJI ◎	24				
49	Voltmeter Change-Over Switch(VS)	200V,ah30-P2V ◎	24				
50	Block terminal	BTB30C3P,IZUMI ◎	24				
51	Block terminal	BTB30C24P,IZUMI ◎	24				
52	Nut screwdriver #1(Box driver)		0				
53	Nut screwdriver #2(Box driver)		0				
54	Set of drill edge	M1.6~M12, ISHIIHASHI ◎	1				
55	Contrivance of Conveyor belt	SKD-18A, SANEI ◎	2				
56	Contrivance of Design for Sequence control circuit	TR-74BLR ◎	2				
57	Handy programing console	C200H-PRO-27, OMRON ◎	1				
58	Interface(cable)	C200H-CN222, OMRON ◎	1				
59	Central Processing Unit	CPMIA-40CDR-A, OMRON ◎	1				
60	SYSMAC-CPT(Windows3.1/95)	WS 01-CPTC1-J, 150,000yen	1				
61	Interface	CQM1-CIF 01, OMRON, 35,000yen	1				
62	{Model of elevator(4F)}	(MD-104), SANRITU, 1,450,000yen	1				
	{Model of elevator(4F) control box}	(MD-104RC), SANRITU, 188,000yen	1				
63	DIN Rail	PFP-100N2, 1m, 16mm ◎	24				
64	End Plate	PFP-M ◎	96				
65	Panel(Mesh plate)	SANEI ◎	24				
Total							

Equipments list

No. 4/5

Related curriculum: Sequence control practice

Room:

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
66	Shelf	225-1020,1200W,1800H,450D, UCHIDA, 34,600yen	4			TENISIE
67	Book shelf	C300-275,UCHIDA, 56,000yen	4			TENISIE
68	Base of Bookshelf	A300-2664,UCHIDA, 5,400yen	4			TENISIE
69	Desk for experimentation	FW-KTB693N,KOKUYO, 104,500yen	8			TENISIE
70	Chair for experimentation	CR-F2, 6,800yen	23			TENISIE
71	Desk	SD-S5F KOKUYO, 32,500yen	1			TENISIE
72	Side desk	SD-S9E3 KOKUYO, 32,500yen	1			TENISIE
73	Bushing(rubber)	C-30SG 18A,MISUMI	5	◎		
74	Bushing(rubber)	C-30SG 24A,MISUMI	5	◎		
75	Hand cart	TK-10,KOKUYO	1	◎		
76	Screw	NABE M6,MISUMI, 3,610yen/100Q'TY	1			
	Screw	NABE M5,MISUMI, 3,480yen/100Q'TY	1			
	Screw	NABE M4,MISUMI, 3,810yen/100Q'TY	1			
	Screw	NABE M3,MISUMI, 4,340yen/100Q'TY	1			
77	Cutting nipper (Mini)	N-31,MISUMI	24	◎		
78	Crimper	PA-01,MISUMI	24	◎		
79	Cutting plier (Pench)	HOZAN,	24	◎		
790	Nut Driver	D854-5,HOZAN ,200yen	24			
	Nut Driver	D855-5.5,HOZAN ,200yen	24			
	Nut Driver	D857-7,HOZAN, 200yen	24			
	Nut Driver	D858-8,HOZAN, 200yen	24			
	Nut Driver	D856-10,HOZAN, 200yen	24			
80	Tool box	B55-0,HOZAN, 7,100yen	24			
		Total				

Equipments list

No. 5/5

Related curriculum: Sequence control practice

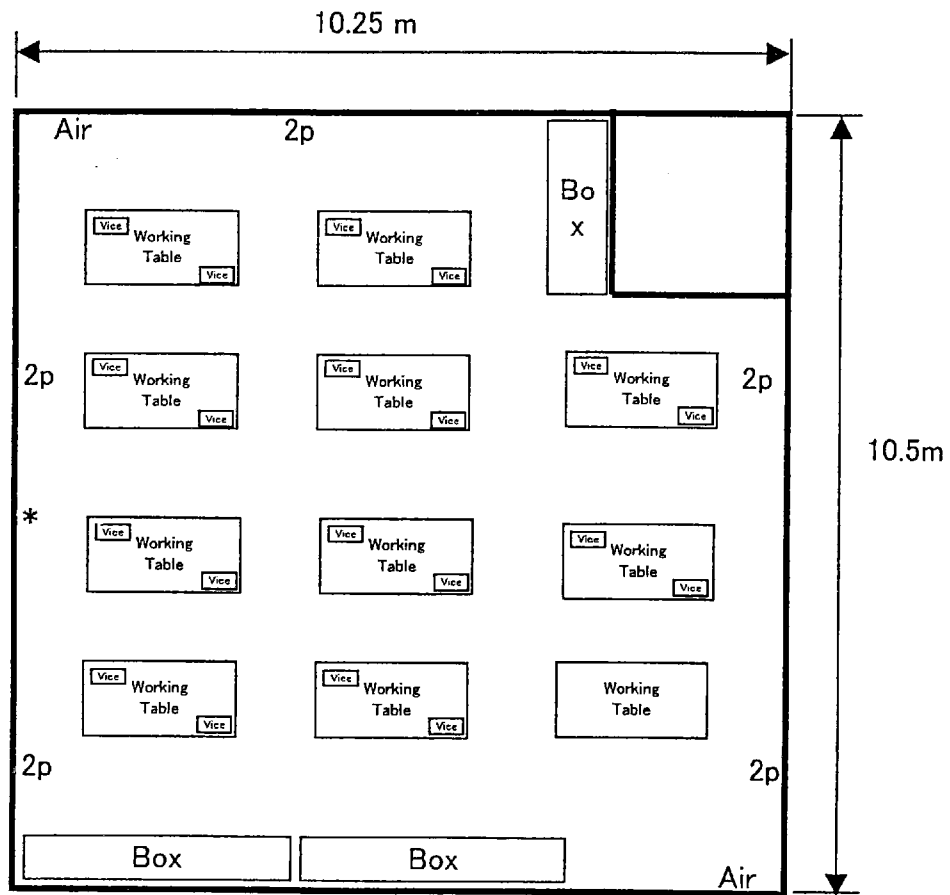
Room:

No.	Equipments	Specification	Q'TY	Estimated cost (yen)		Reference
				Unit price	Total	
81	Screw driver set	'+, -, #1~#3, (6drivers), FUJI, 3,000yen	24			TUNISIE
82	Filing cabinet	EA957DA, 10rank, 6file, FUJI, ◎	2			
83	Protective glasses for eyes	EA800GD, FUJI	2			
84	Scale	EA720YA-30, FUJI	24			
85	Scale(right angle)	EA720WA-30, FUJI	24			
86	Tape Measure	EA720G-3, FUJI	24			
87	Vice	EA525C-150, FUJI ◎	5			
88	Spring washer set	EA949SF, M3~M12, FUJI ◎	1			
89	Metal washer set	EA949SE, M3~M12, FUJI ◎	1			
90	Knife(vinyl insulation cutter)	EA589E-2, FUJI ◎	24			
91	Cable REAL(pile up type)	EA632AB-300, FUJI ◎	5			
92	Machine of fretsaw	EA854ZB, FUJI ◎	1			
93	Hacksaw	EA582BF, FUJI	12			
94	Plier(water pump plier)	EA531NA, FUJI	24			
95	Monkey wrench	EA5305-200, FUJI	5			
96	Tube(spiral tube)	EA944BS-15, FUJI ◎	2			
97	Pipe bender	DS0029, National ◎	1			
98	Screw cutter	REKKIS ◎	1			
99	(Vinyl)string	1.5φ, TAIYO KASEI ◎	24			
100	Single phase volt slider	YAMABISH S-260-10 Y-3(200V,10A) ◎	4			
101	Three phase volt slider	YAMABISH S3P-240-10 Y-7(200V,10A) ◎	1			
102	Crimper(Hous wiring)	ROBSTER, AK-107	5			
Total						

Handwritten mark

Handwritten mark

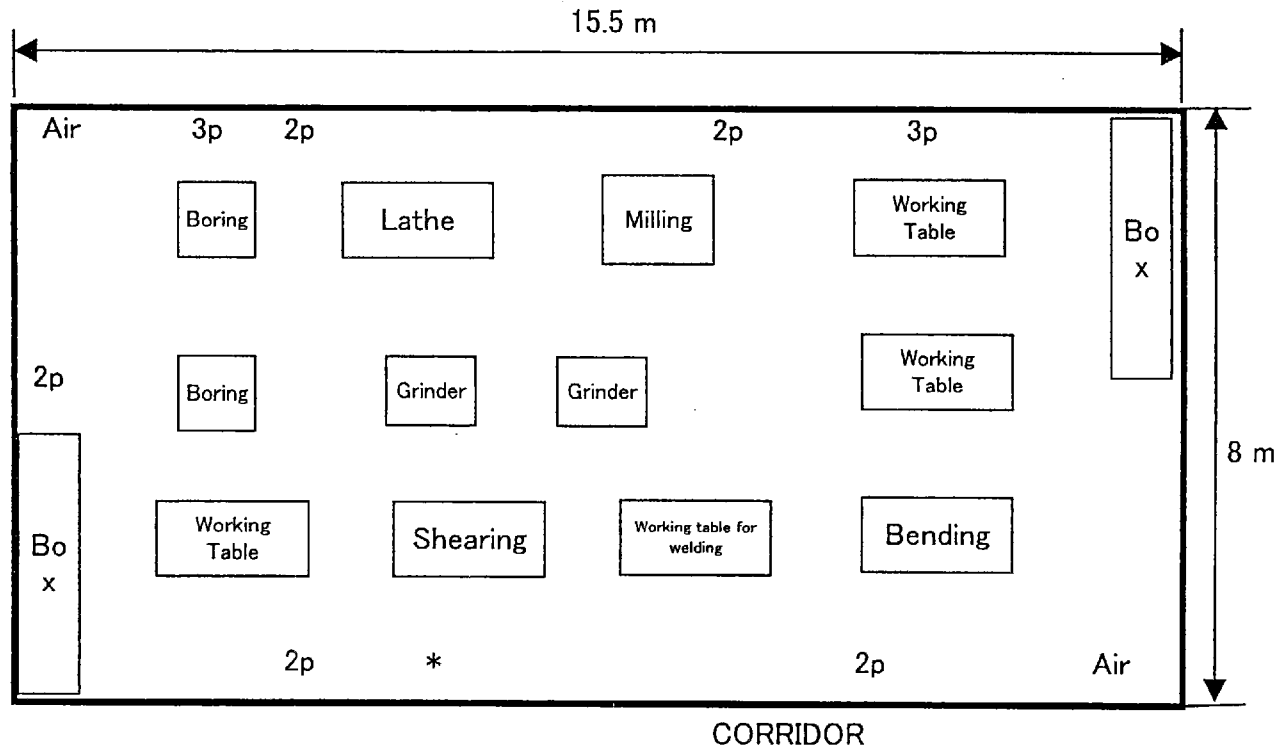
Inside layout of laboratory and workshop Hadiwork workshop



* : White board

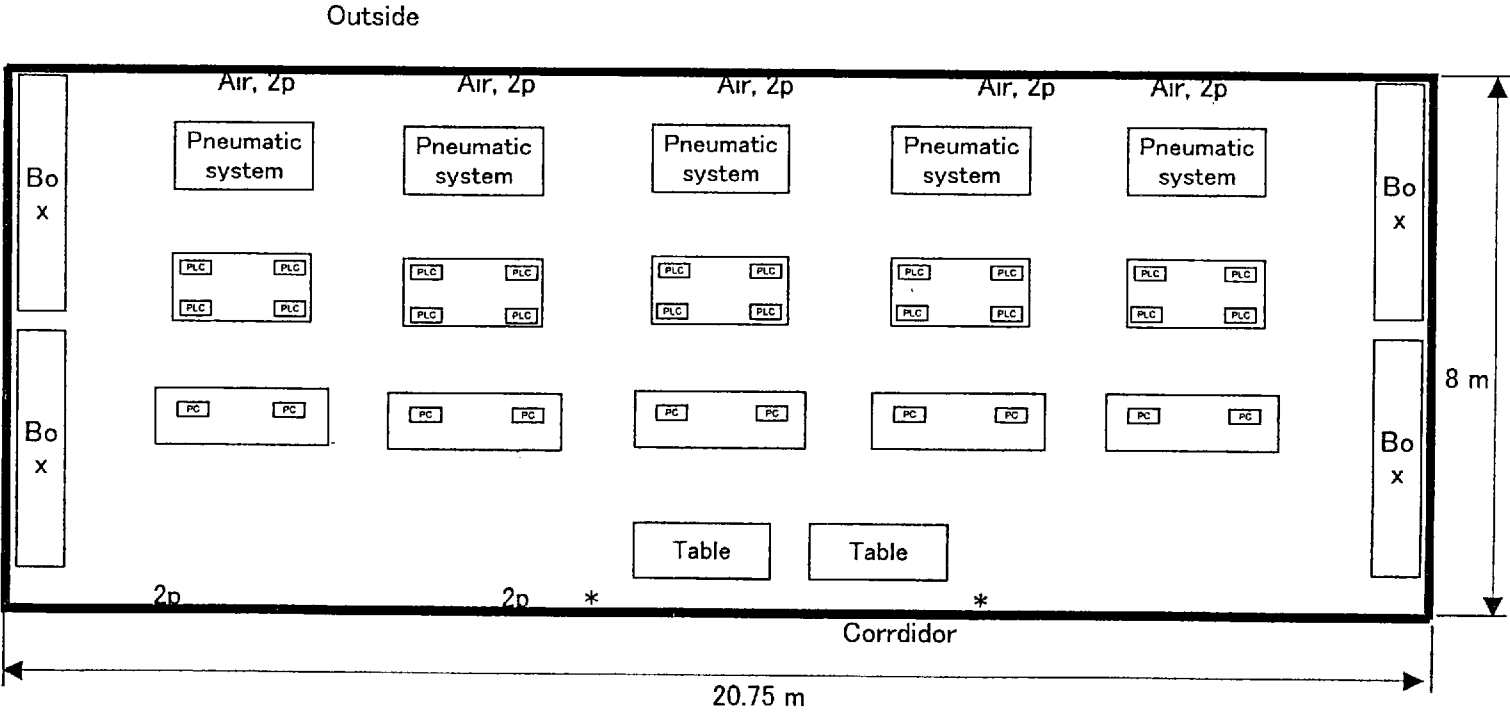
Inside layout of laboratory and workshop
Machinery workshop

COURB CENTRALE



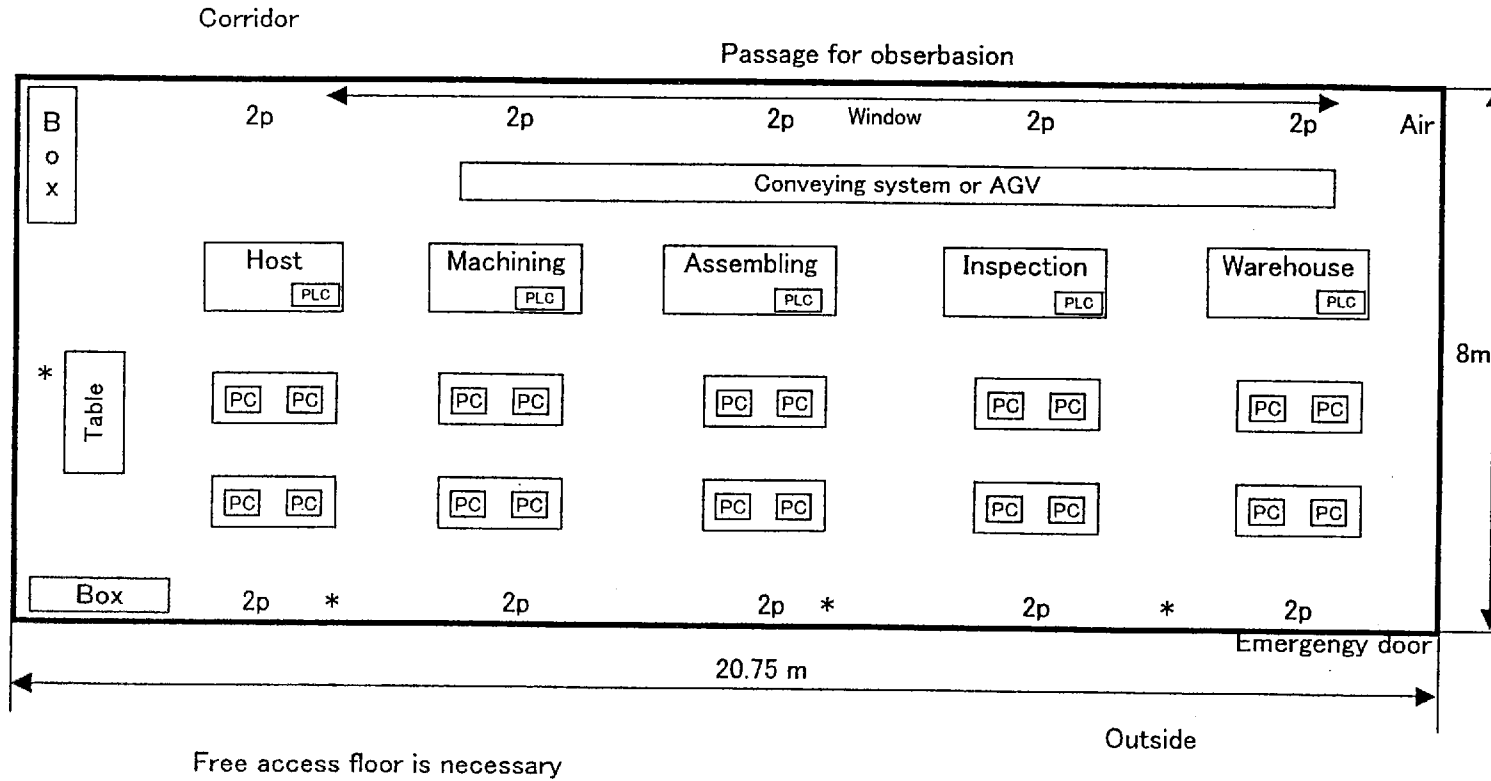
* : White board

Inside layout of laboratory and workshop
 PLC-Pneumatic training room



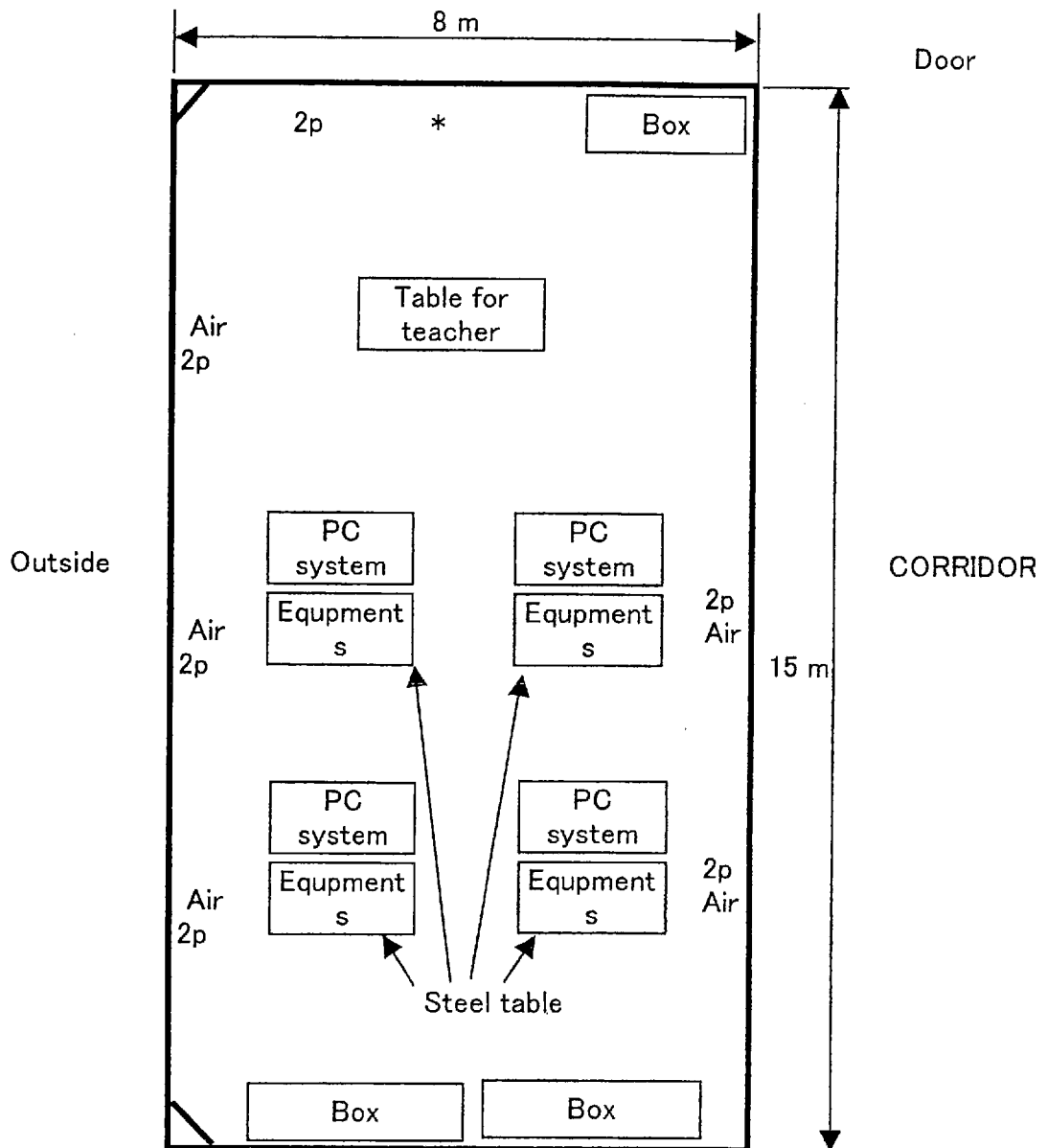
* : White board

Inside layout of laboratory and workshop Factory automation workshop



* : White board

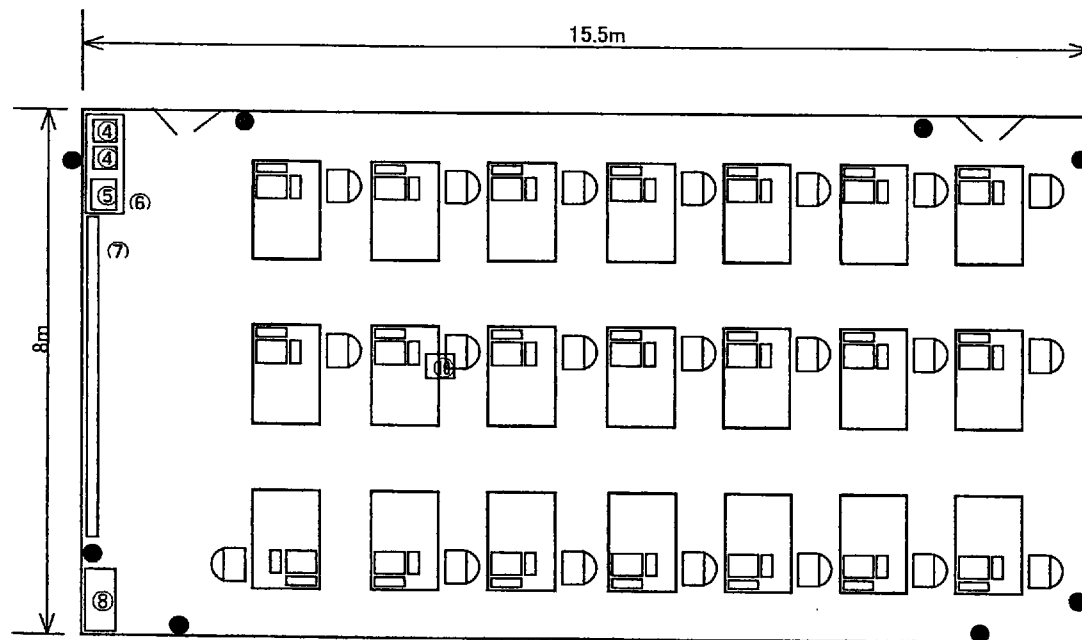
Inside layout of laboratory and workshop Machatronic workshop



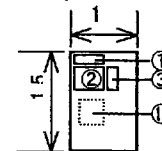
* : White board

Inside layout of laboratory and work shop

Computer laboratory forelectronics



Computer desk



- ① Computer
- ② Monitor
- ③ Keyboard
- ④ Ink jet printer
- ⑤ Laser printer
- ⑥ Desk for printer
50*150 one or 50*50 three
- ⑦ White board
- ⑧ Cupboard or locker with key
- ⑩ Video projector
It's set on the ceiling.
- ⑫ UPS (under desk)

It is necessary blind on the window.

Floor must be free access.

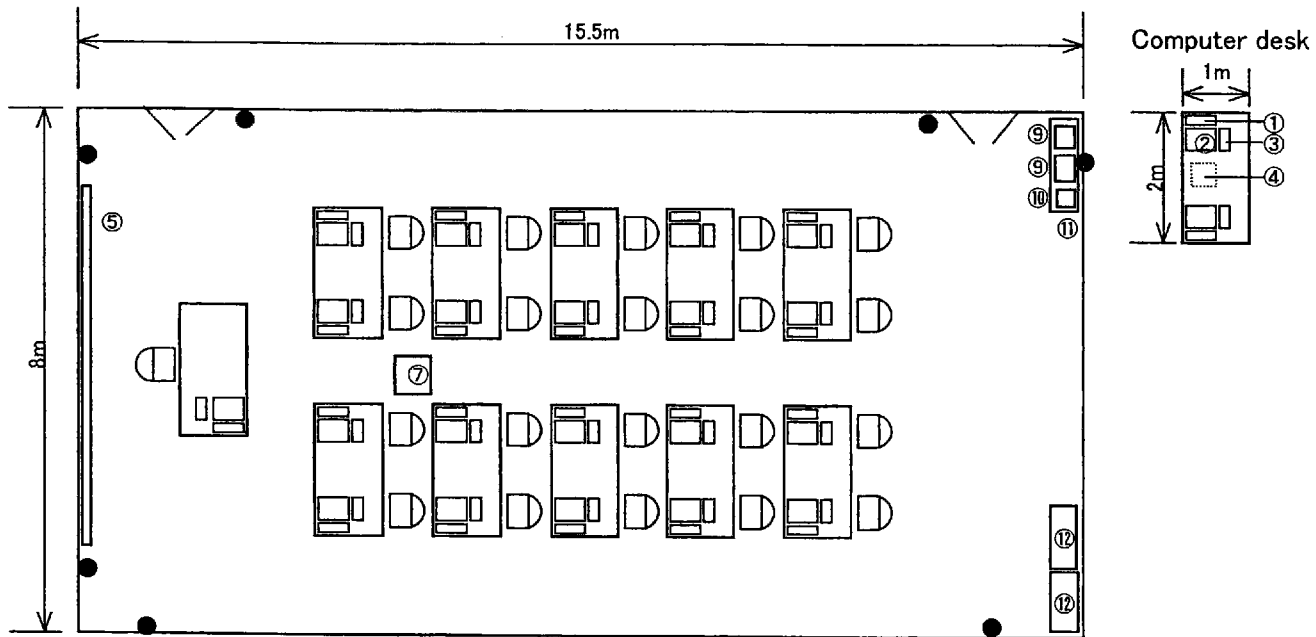
It is necessary the lumps for
white board

Evry work bench has more than
three(3) AC power plugs.

● AC power plug position on the wall.

Inside layout of laboratory and workshop

Computer laboratory



● AC power plug position on the wall.

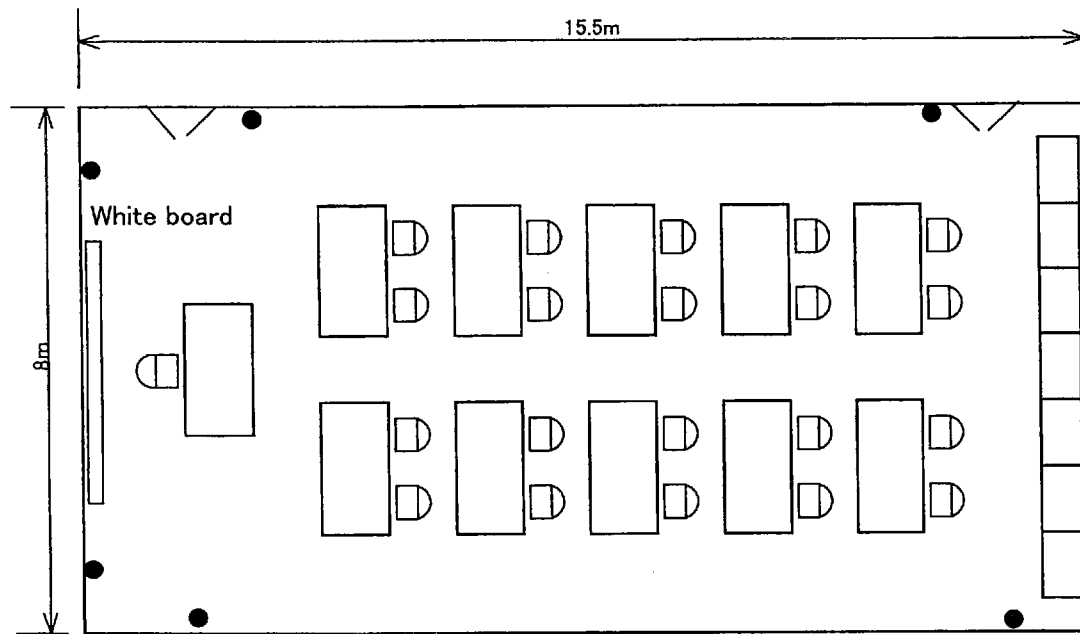
- ① Computer
- ② Monitor
- ③ Keyboard
- ④ PUS (under desk)
- ⑤ White board
- ⑥ Screen
- ⑦ Video projector
It's set on the ceiling.
- ⑨ Injet printer
- ⑩ Laser printer
- ⑪ Desk for printer
50*150 one or 50*50 three
- ⑫ Cupboard or locker with key

It is necessary blind on the window
Floor must be free access.

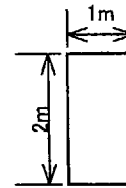
Evry work bench has more than
six(6) AC power plugs.

Inside layout of laboratory and workshop

Analogue electronics laboratory

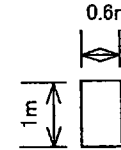


Work bench



Evry work bench has more than six(6) AC power plugs.

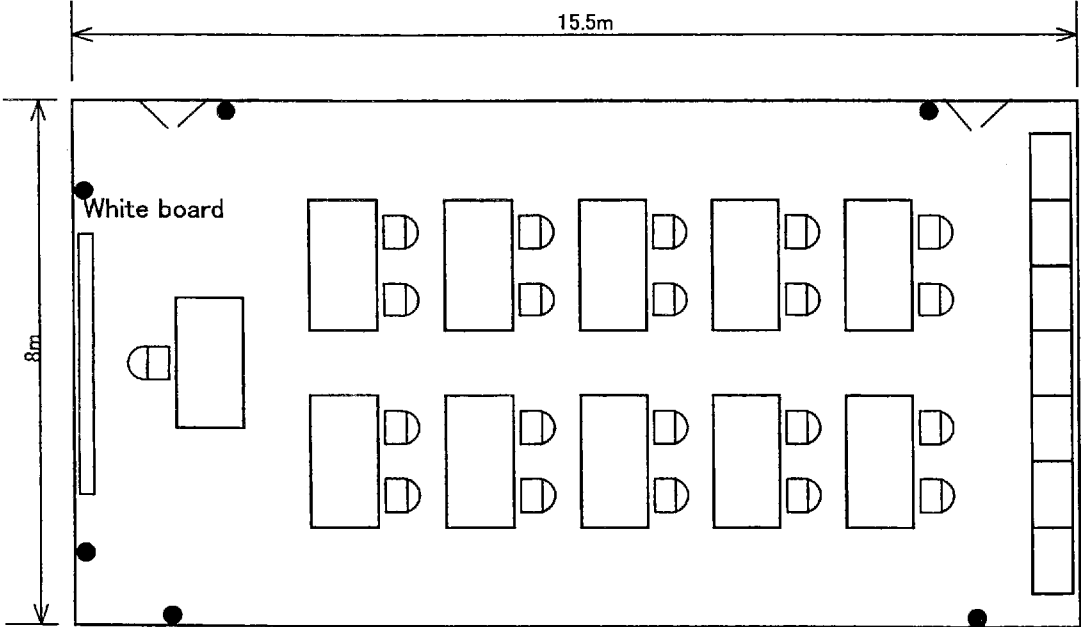
Cupboard



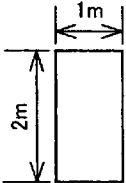
● AC power plug position on the wall.

Inside layout of laboratory and workshop

Digital electronics laboratory

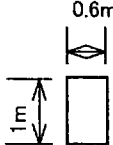


Work bench



Evry work bench has more than six(6) AC power plugs.

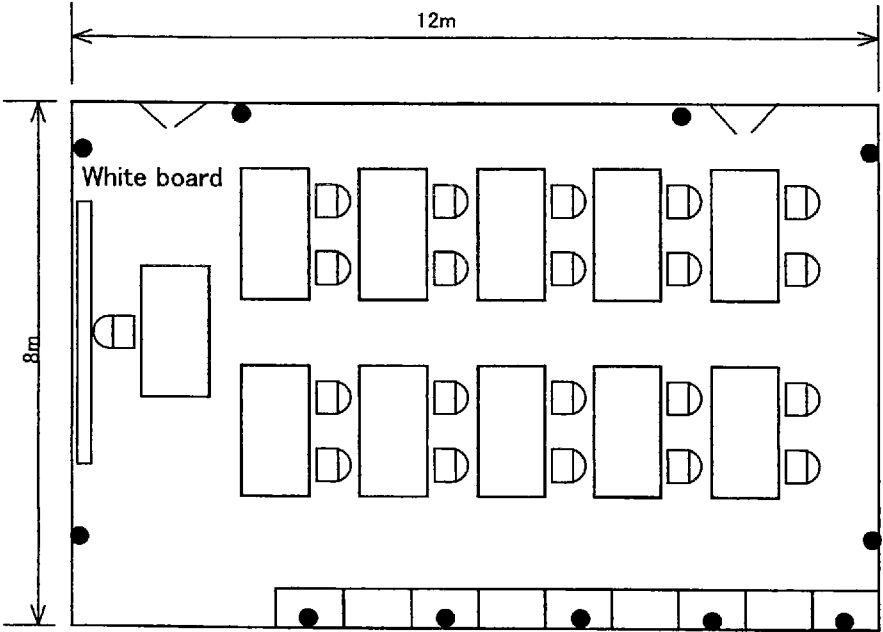
Cupboard



● AC power plug position on the wall.

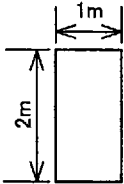
Inside layout of laboratory and workshop

Assembling laboratory



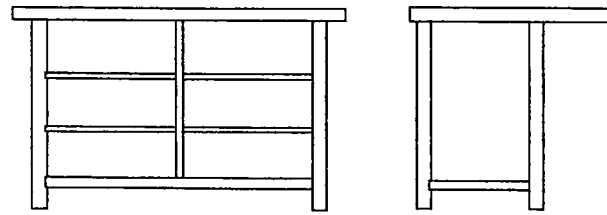
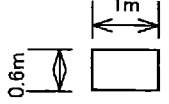
● AC power plug position on the wall.

Work bench



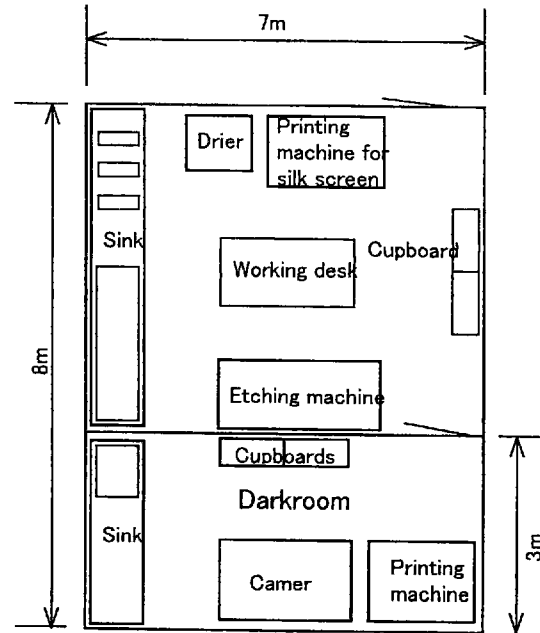
Every work bench has more than six(6) AC power plugs.

Side work bench



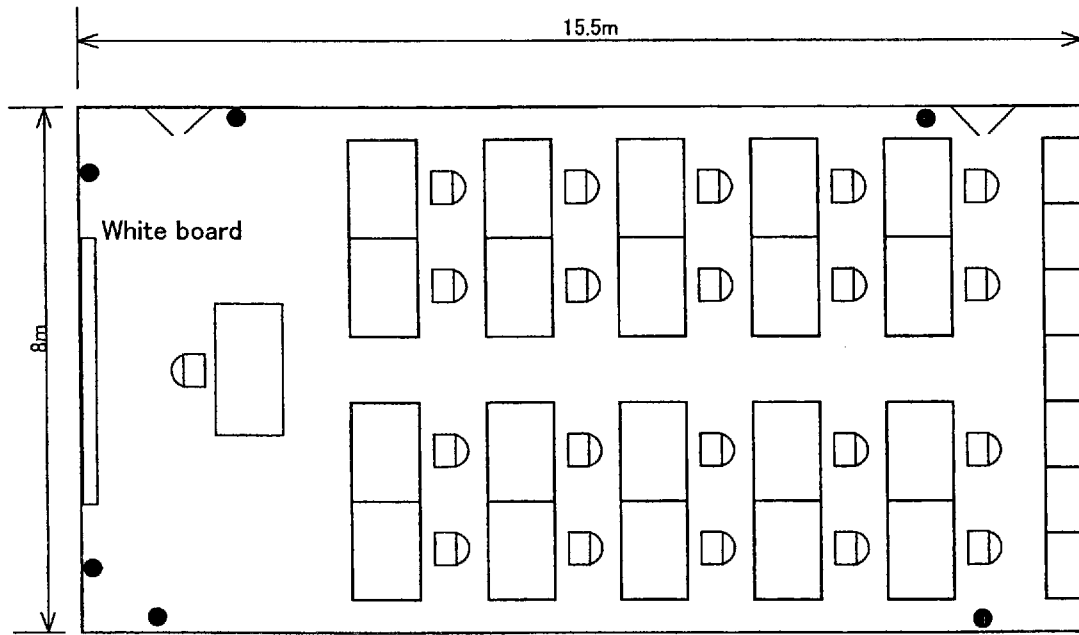
Inside layout of laboratory and workshop

Printed circuit board laboratory



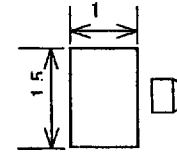
Inside layout of laboratory and workshop

Microcomputer laboratory



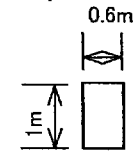
● AC power plug position on the wall.

Working desk



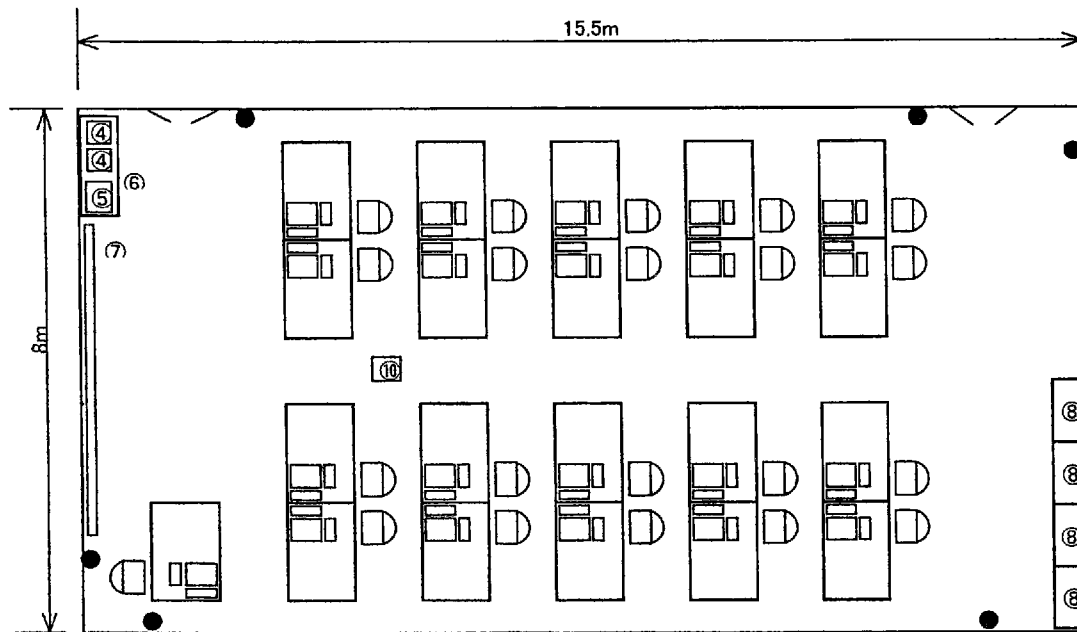
Every work bench has more than three(3) AC power plugs.

Cupboard



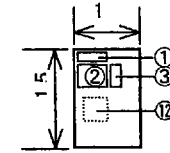
Inside layout of laboratory and workshop

Computer laboratory for electronics



● AC power plug position on the wall.

Computer desk



- ① Computer
- ② Monitor
- ③ Keyboard
- ④ Ink jet printer
- ⑤ Laser printer
- ⑥ Desk for printer
50*150 one or 50*50 three
- ⑦ White board
- ⑧ Cupboard or locker with key
- ⑩ Video projector
It's set on the ceiling.
- ⑫ UPS (under desk)

It is necessary blind on the window.

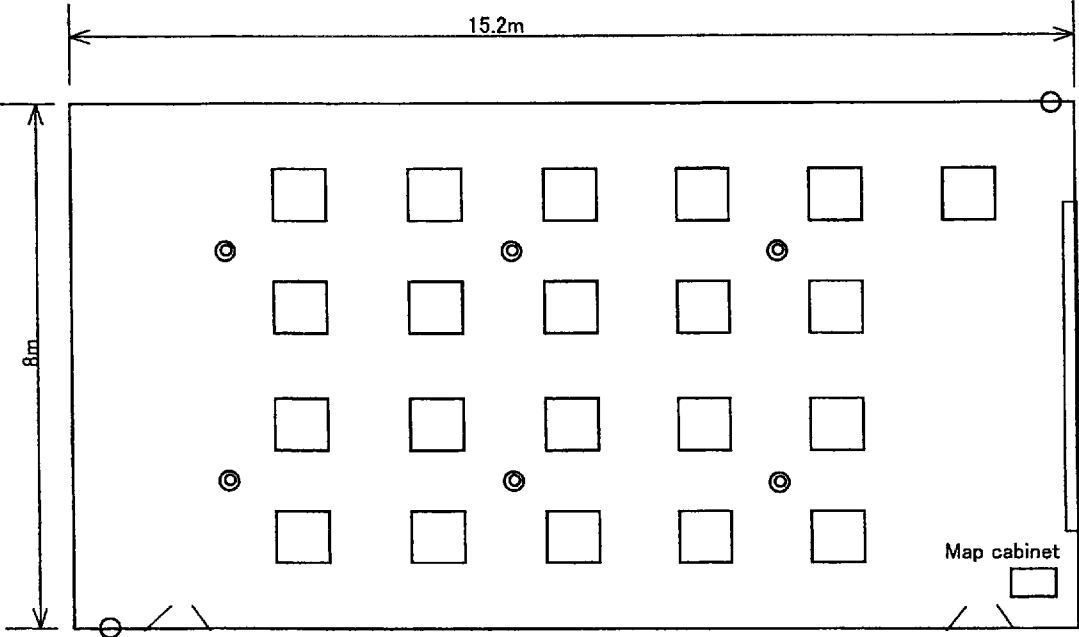
Floor must be free access.

For power and LAN.

Evry work bench has more than three(3) AC power plugs.

Inside layout of laboratory and workshop

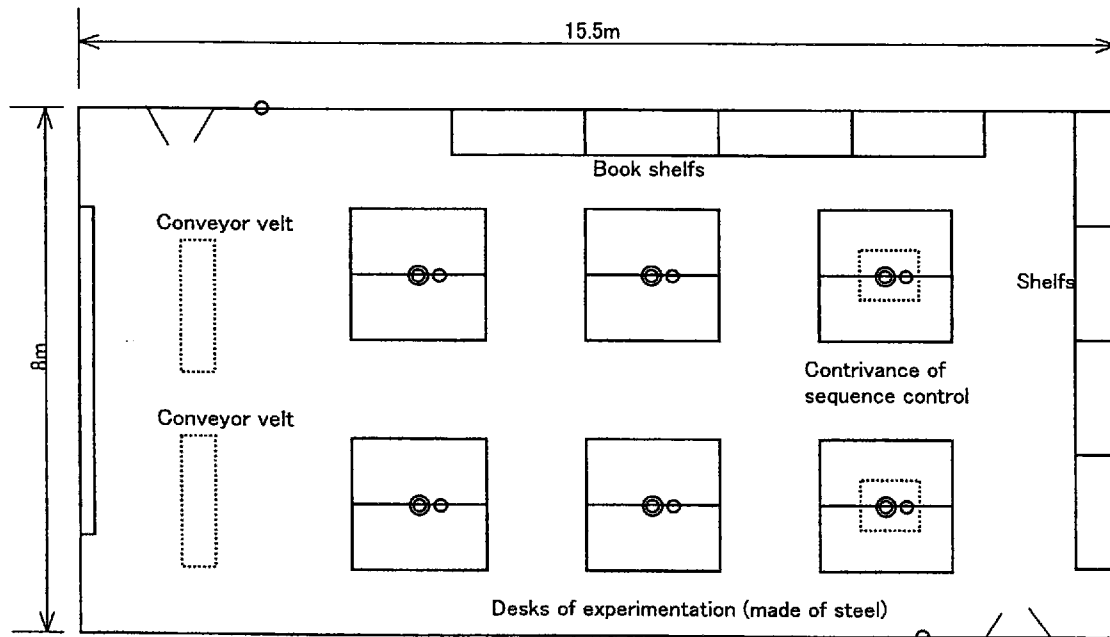
Drawing laboratory



An example: Underfloor duct
⊙ (High tension stand)
○ Plug socket

Inside layout of laboratory and workshop

Sequence control laboratory

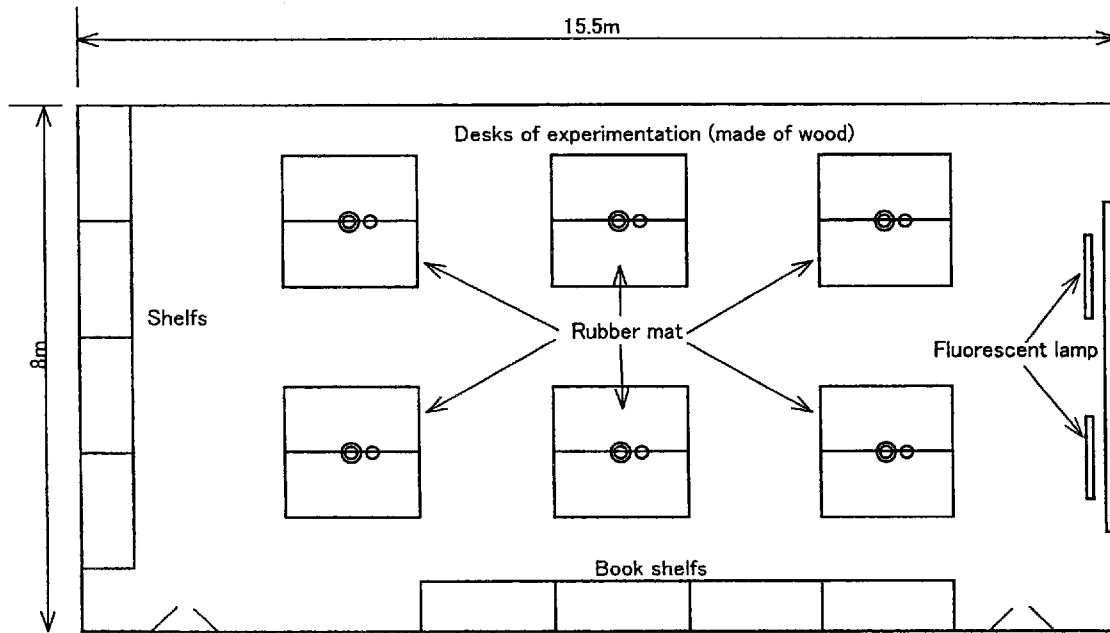


An example: Underfloor duct

- ⊙ (High tension stand)
Power source : 1Φ, 3Φ
- Plug socket
- Contrivance of practice

Inside layout of laboratory and workshop

Basic measurement laboratory

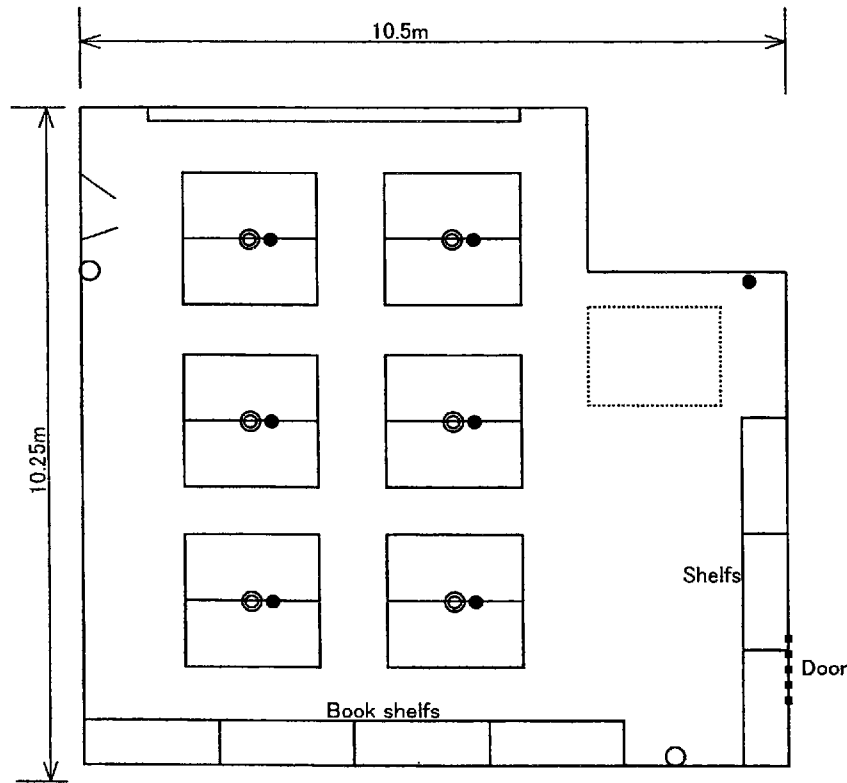


An example: Underfloor duct

- (High tension stand)
- Power source : 1 Φ , 3 Φ
- Plug socket

Inside layout of laboratory and workshop

Electric machinery laboratory



An example; Underfloor duct

⊙ (High tension stand)

Power source : 1 Φ

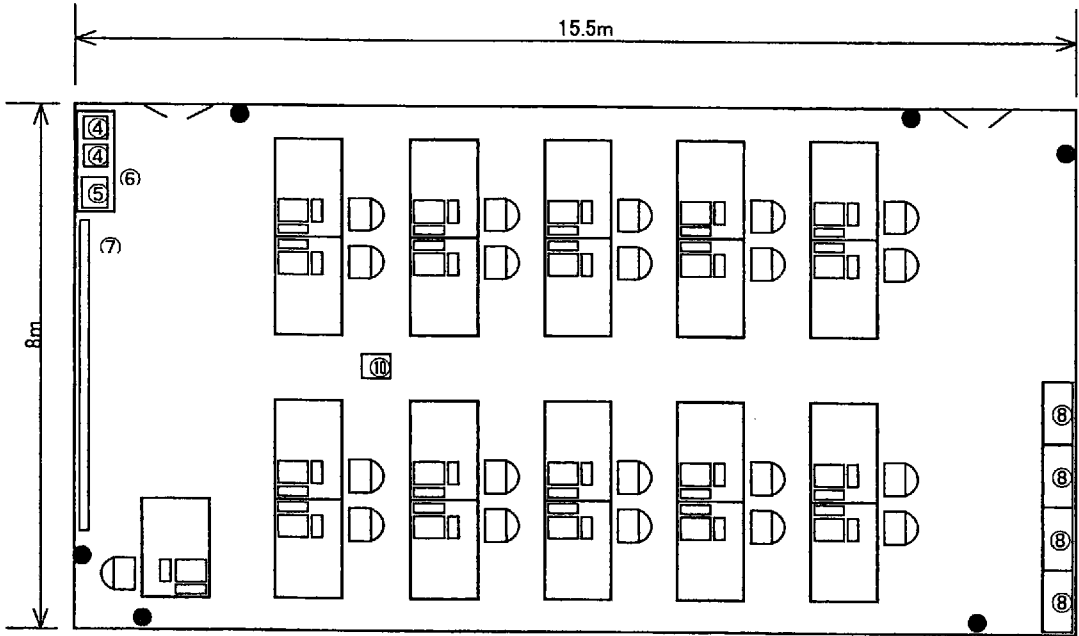
● Power source : 3 Φ

○ Plug socket

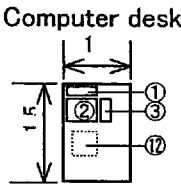
□ Contrivance of practice (3 Φ)

Inside layout of laboratory and workshop

Computer laboratory



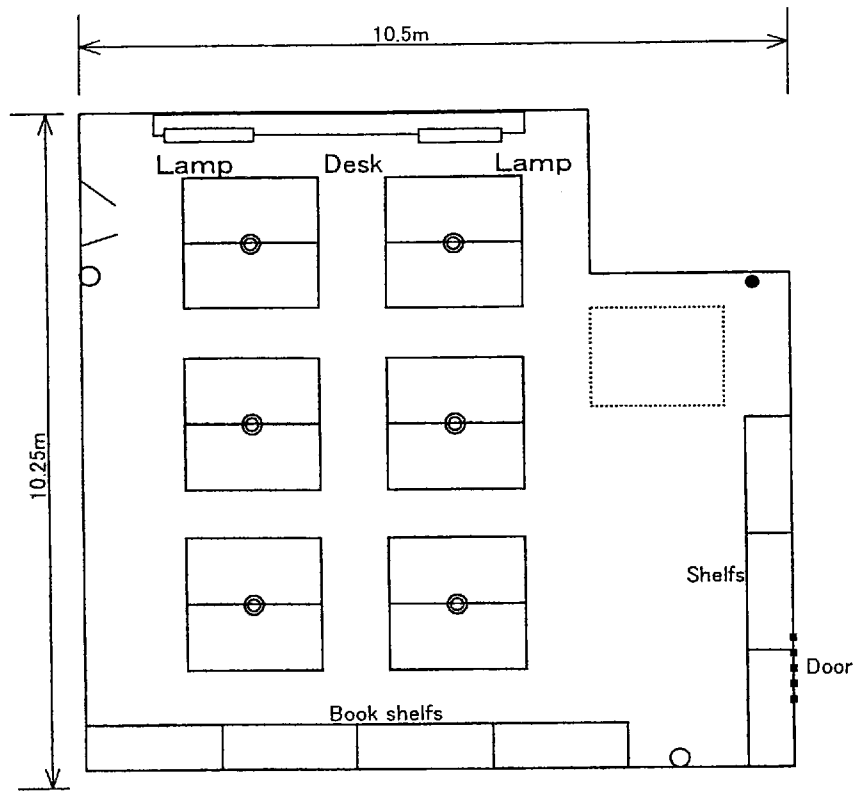
● AC power plug position on the wall.



- ① Computer
- ② Monitor
- ③ Keyboard
- ④ Ink jet printer
- ⑤ Laser printer
- ⑥ Desk for printer
50*150 one or 50*50 three
- ⑦ White board
- ⑧ Cupboard or locker with key
- ⑩ Video projector
It's set on the ceiling.
- ⑫ UPS (under desk)

It is necessary blind on the window.
 Floor must be free access.
 For power and LAN.
 Evry work bench has more than
 three(3) AC power plugs.

Inside layout of laboratory and workshop
Electric machinery laboratory

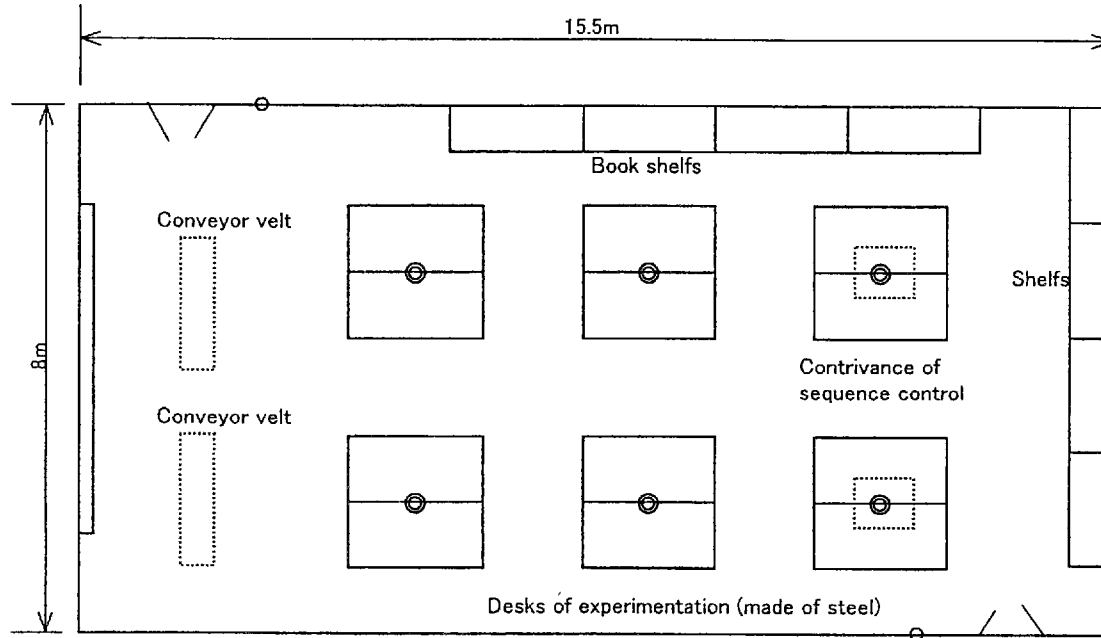


An example: Underfloor duct

- ⊙ (High tension stand)
Power source : $1\Phi, 3\phi$
- Power source : 3ϕ
- Plug socket
- Contrivance of practice (3Φ)

Inside layout of laboratory and workshop

Sequence control laboratory

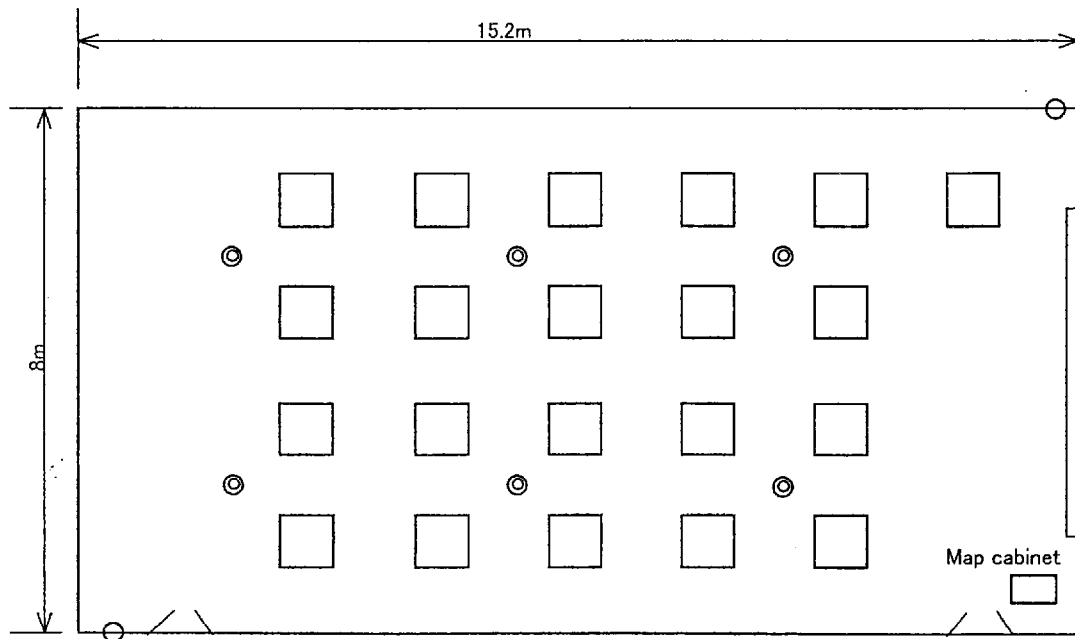


An example: Underfloor duct

- ⊙ (High tension stand)
Power source : 1Φ, 3Φ
- Plug socket
- Contrivance of practice

Inside layout of laboratory and workshop

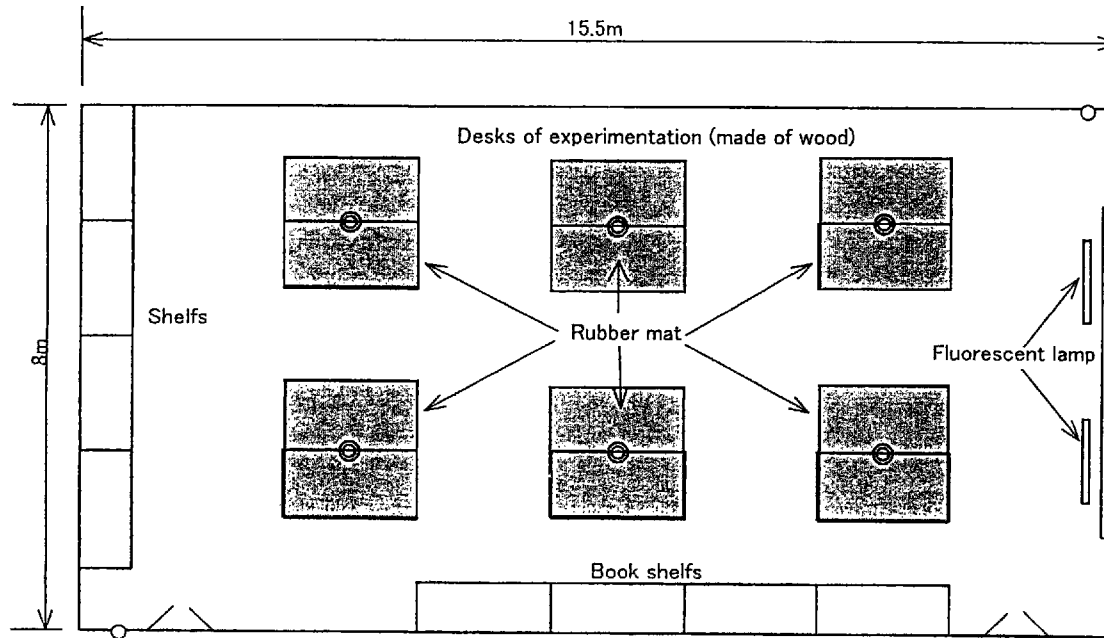
Drawing laboratory



An example: Underfloor duct
⊙ (High tension stand)
○ Plug socket

Inside layout of laboratory and workshop

Basic measurement laboratory



An example: Underfloor duct

● (High tension stand)

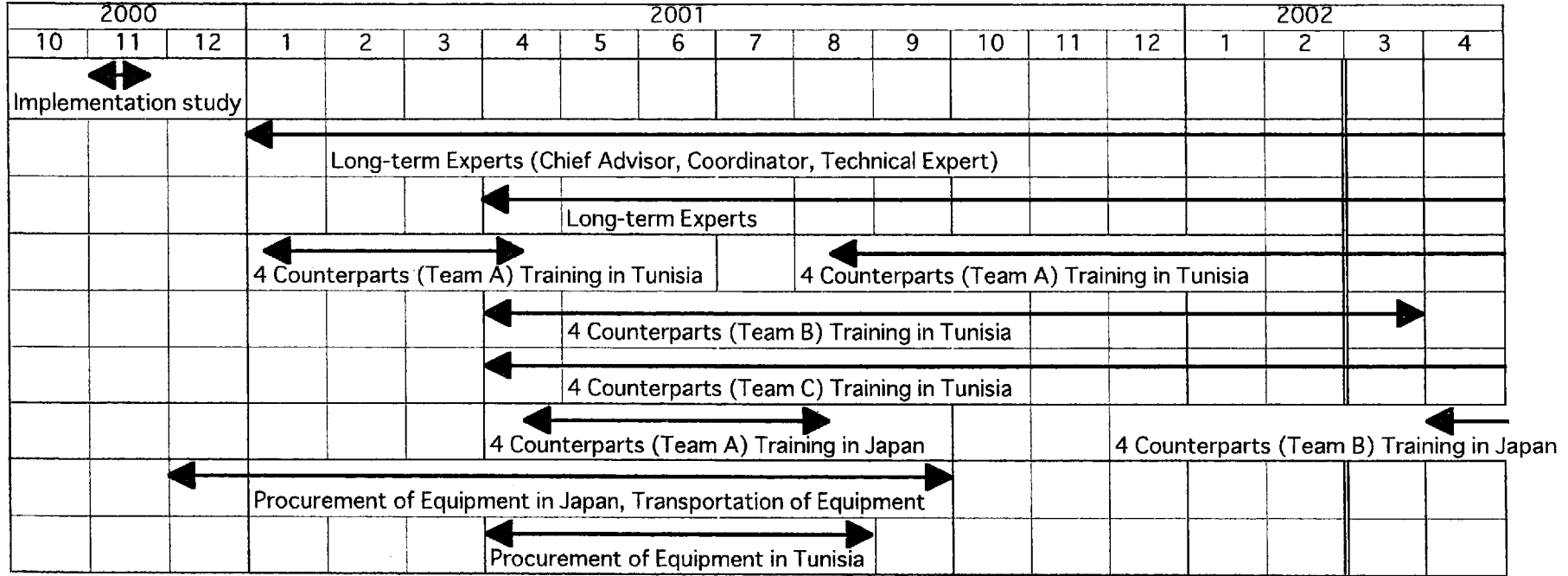
Power source : 1 Φ , 3 Φ

○ Plug socket

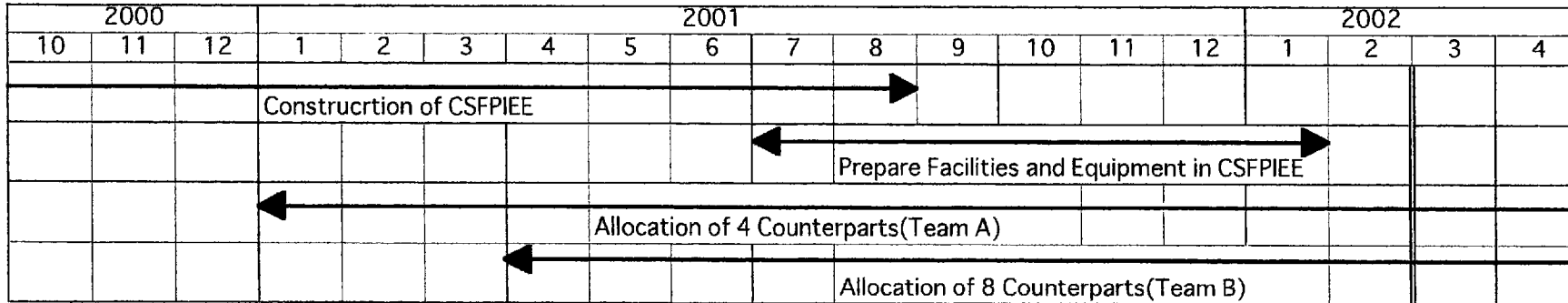
ANNEX VII Tentative Schedule before Starting the Training Courses

Japanese Side

03 2000



Tunisian Side



Start the Training Courses

Handwritten mark

Annex VIII

Construction schedule of CSFPIEE

MARCH 2000

Operation	Duration	Beginning	End
Modifications of Buildings plan referring to team recommendation	35	13-03-2000	17-04-2000
Approval of plans after verification	7	18-04-2000	25-04-2000
Preparation of tender documents	30	26-04-2000	26-05-2000
Tender advertisement	21	27-05-2000	17-06-2000
Opening tender and presentation in presence of the department committee of public market	21	18-06-2000	09-07-2000
Constructors contract	3	10-07-2000	13-07-2000
Construction	365	14-07-2000	14-07-2001
Handling over	30	15-07-2001	14-08-2001