

Table 2-5 Summary of Study of the Equipment

Code	Description of Equipment	Qty	Unit	Course	Classification			Purpose of Use	Necessity	Evaluations			Subject Investigated
					R	A	N			Planned	Stability	Cost	
<b>A. Equipment for Multipurpose Lecture Theater</b>													
1	Stage Lighting Equipment												
1.1	Boom for Spotlights	1	lot	HEXA011 Expressive Arts I, etc.	1			To hang spot lights from the ceiling	o	x		1	Low priority since it is to be used as a general studio facility, not solely for educational use.
1.2	Piano-convex Spotlight	12	unit	HEXA011 Expressive Arts I, etc.	12			To study technique of stage lighting	o	o		12	Indispensable students learning on lighting effects. Portable type will be planned in the old theater.
1.3	Fresnel Spotlight	36	unit	HEXA011 Expressive Arts I, etc.	36			Ditto	o	o		36	Ditto
1.4	Follow Spotlight	3	unit	HEXA011 Expressive Arts I, etc.	3			Ditto	o	o		3	Ditto
1.5	Lamp for Spotlight	100	unit	HEXA011 Expressive Arts I, etc.	100			Spare lamps	o	o		100	Necessary as spare lamps for the spot lights. To be located in the old theater.
1.6	Remote control system for 8 spotlights	1	set	HEXA011 Expressive Arts I, etc.	1			To study technique of stage lighting	x	x		1	Low priority since it is to be used as a general studio facility, not solely for educational use.
1.7	Poly Color Filter	100	unit	HEXA011 Expressive Arts I, etc.	100			To study color effect of stage lighting	o	o		100	Necessary as accessories for stage lighting. To be located in the old theater.
1.8	Code, cable, stand, hanger, arm, etc. for boom	1	lot	HEXA011 Expressive Arts I, etc.	1			Auxiliary items for stage lighting	o	o		1	Necessary for stage lighting. To be located in the old theater.
1.9	Power & Dimmer rack	1	set	HEXA011 Expressive Arts I, etc.	1			To adjust the lighting device	o	o		1	Indispensable students learning on lighting effects. Portable type will be planned in the old theater.
1.10	Cable Terminal Box	1	set	HEXA011 Expressive Arts I, etc.	1			To connect spot lights	o	o		1	Ditto
1.11	Lighting Control Board	1	set	HEXA011 Expressive Arts I, etc.	1			To control the lighting device	o	o		1	Ditto
1.12	Insulation Material	1	lot	HEXA011 Expressive Arts I, etc.	1			To install the lighting device	o	o		1	Ditto
2	Equipment for Presentation & Lecture												
2.1	Interactive White Board, Touch panel system	1	unit	EPG321 Introduction to Guidance & Counseling, etc.	1			For presentation	o	x		1	Considered not practical nor adequate for use in a large space like a theater.
2.2	3D Object Presenter	1	unit	EPG322 Introduction to Guidance & Counseling, etc.	1			Ditto	o	o		1	Not practical in terms of frequency of use in the theater. To use the multimedia projector (K.1.8 & 1.9) for common use.
2.3	Lap Top PC	1	unit	EPG323 Introduction to Guidance & Counseling, etc.	1			For preparation of presentation materials	o	o		1	Ditto
2.4	Table for 3D Object Projector	1	unit	EPG324 Introduction to Guidance & Counseling, etc.	1			For presentation	o	x		1	To be prepared by the PNG side.
2.5	Wireless Microphone System - 2 channel	1	set	EPG325 Introduction to Guidance & Counseling, etc.	1			Ditto	o	x		1	Existing device can be used.
<b>B. Equipment for the New Library</b>													
1	Stacks, Reading Table & Chair												
1.1	Ground Floor												
1.11	Book Stacks	44	unit	Academic service	44			For self study and research	o	o	40	4	Considered useful for students education. In order to store 140,000 books and journals, using shelves of 50cm width (4 stacks), 70 shelves in total are required. 40 shelves will be located on the ground floor. This quantity is sufficient in consideration of future increase of books by approx. 7% in 5 years.
1.12	Reading Table	13	unit	Academic service	13			Ditto	o	o	21		Assuming 200 hundred students, teachers and staff use reading tables every hour, 38 tables with 6 chairs are needed with 10% allowance. Among 38, 21 tables will be located on the ground floor.
1.13	Reading Chair	104	unit	Academic service	104			Ditto	o	o	128		6 chairs each for 21 tables (A.1.12) are planned.
1.2	First Floor												
1.21	Book Stacks	44	unit	Academic service	44			For self study and research	o	o	30	14	From among 70 shelves (A.1.11), 30 will be located on the first floor.
1.22	Reading Table	26	unit	Academic service	26			Ditto	o	o	17	9	From among 38 tables (A.1.12), 17 will be located on the first floor.
1.23	Reading Chair	208	unit	Academic service	208			Ditto	o	o	102	106	6 chairs each for 17 tables (A.1.22) are planned.
1.3	Mezzanine Floor												
1.31	Book Stacks	60	unit	Academic service	60			For self study and research	x	x		60	To be prepared by the PNG side.
1.32	Reading Table	1	unit	Academic service	1			Ditto	x	x		1	Ditto
1.33	Reading Chair	4	unit	Academic service	4			Ditto	x	x		4	Ditto
2	Furniture for Staff offices and Rooms												
2.1	Ground Floor												
2.1	Cataloging & Accession Room	1	lot	Academic service	1			For clerical works	x	x		1	To be prepared by the PNG side.
	Office #1	1	lot	Academic service	1			Ditto	x	x		1	Ditto
	Office #2	1	lot	Academic service	1			Ditto	x	x		1	Ditto
	Community School Library Room	1	lot	Academic service	1			Ditto	x	x		1	Ditto
	AV Lounge	1	lot	Academic service	1			Ditto	x	x		1	Ditto
	Printery Room	1	lot	Academic service	1			Ditto	x	x		1	Ditto

Code	Description of Equipment	Qty	Unit	Course	Classification			Purpose of Use	Need for Safety	Suitability	Evaluation	Planned Qty				Subject Investigated
					R	A	N					A	B	C		
2.2	First Floor															
	Librarian's Office	1	lot	Academic service	1				x	x	x				To be prepared by the PNG side.	
	Librarian's Secretary Room	1	lot	Academic service					x	x	x				Ditto	
	Assistant Librarian Office	1	lot	Academic service	1				x	x	x				Ditto	
	Staff Meeting Room	1	lot	Academic service	1				x	x	x				Ditto	
	Office	1	lot	Academic service	1				x	x	x				Ditto	
	Seminar Room	1	lot	Academic service	1				x	x	x				Ditto	
	Maps Room	1	lot	Academic service	1				x	x	x				Ditto	
	AV Unit (Section)	1	lot	Academic service	1				x	x	x				One set is planned for use in education of geography. Eliminated: Not directly related to student education.	
	Mezzanine Floor															
2.3	Carrels (study booth)	1	lot	Academic service					x	x	x				Eliminated: Not directly related to student education. Other computer lab. will serve for the purpose.	
3	Computers															
3.1	Computer - Ground Floor															
	Student Searching	10	unit	Academic service	10				o	o	o				Seven among existing 10 computers for online searching are operable. These 7 sets will be located on the ground floor, while 3 new additional sets (B 3.2) will be located on the first floor.	
	Circulation Counter	2	unit	Academic service	2				x	x	x				Ditto	
	Cataloging & Accession Room	3	unit	Academic service	3				x	x	x				Ditto	
	Office	1	unit	Academic service	1				x	x	x				Ditto	
	Community School Library Room	1	unit	Academic service	1				x	x	x				Ditto	
	Printery Room	1	unit	Academic service	1				o	o	o				To be located in the Printery Section.	
	Computer - First Floor															
3.2	Student Searching	5	unit	Academic service					o	o	o				Seven among existing 10 computers for online searching are operable. These 7 sets (B 3.1) will be located on the ground floor, while 3 new additional sets will be located on the first floor. Those 2 computers for Librarian's Office and Secretary Room shall be included in this item.	
	Librarian Office	1	unit	Academic service	1				o	o	o				To be included in above item for "Student Searching".	
	Librarian's Secretary Room	1	unit	Academic service	1				o	o	o				Ditto	
	Assistant Librarian Office	1	unit	Academic service	1				x	x	x				Eliminated: Not directly related to student education.	
	Maps Room	1	unit	Academic service	1				x	x	x				Ditto	
	AV Unit (Section)	1	unit	Academic service	1				o	o	o				Needed for management of common use AV equipment. To be located in the AV Section (C.6.1).	
3.3	Computer - Mezzanine Floor															
	Carrels (study booth)	12	unit	Academic service					x	x	x				Eliminated: Not directly related to student education. Other computer lab. will serve for the purpose.	
	Work Room	1	unit	Academic service	1				x	x	x				Ditto	
4	Equipment for Library Service - Ground Floor															
4.1	Laser Printer	2	unit	Academic service	2				x	x	x				Eliminated: Not directly related to student education.	
4.2	Scanner	1	unit	Academic service	1				x	x	x				Ditto	
4.3	Photocopy (heavy duty)	2	unit	Academic service	2				x	x	x				Ditto	
5	AV Equipment for AV Lounge - Ground Floor															
5.1	Multimedia Projector	1	unit	Common use					o	o	o				1 set planned for common use of classes that need AV related presentation equipment.	
5.2	Computer	1	unit	Common use	1				o	o	o				Ditto	
5.3	VHS Video player	1	unit	Common use	1				o	o	o				Needed for viewing existing video library in VHS format.	
5.4	CD/DVD Player	1	unit	Common use	1				o	o	o				Needed for viewing existing CD/DVD library.	
5.5	Cabinet	1	unit	Common use	1				o	o	o				Needed for safe keeping of AV equipment.	
5.6	Table for projector	1	unit	Common use	1				x	x	x				Eliminated: Existing table will serve for the purpose.	
5.7	Projector Screen, Ceiling mounted	1	unit	Common use	1				o	o	o				Needed for projection of AV educational materials.	
6	Security System - Entrance															
6.1	Book Guard System	1	unit	Academic service	1				o	x	x				Eliminated: Not necessary to replace existing security guard system	
7	Equipment for AV Section (Common use)															
1	Video Shooting for Students Practice & Academic Staff Use															
1.1	Digital Video Camera with accessories	5	unit	ETE001 Educational Technology					o	x	x				Considered effective in educational technology and training classes. To be located in the AV Section for proper operation and maintenance and will be rented out whenever necessary.	
1.11	Spare Charger	2	unit	ETE001 Educational Technology					o	x	x				Ditto	
1.12	Spare Battery	5	unit	ETE001 Educational Technology					o	x	x				Ditto	
1.2	Rain Cover for Video Camera	5	unit	ETE001 Educational Technology					o	x	x				Ditto	

Code	Description of Equipment	Qty	Unit	Course	Classification			Purpose of Use	Need	Suitability			Planned Qty	Subject Investigated
					R	A	N			ly	on	A		
1.3	Tripod	5	unit	ETE001 Educational Technology			5						5	Ditto
1.4	Carrying Case	5	unit	ETE001 Educational Technology			5						5	Ditto
2	Non-linear Video Editing & DTP System for Students Practice(3) & Academic Staff Use(4)													
2.1	Personal Computer with 17 inch monitor	5	set	ETE001 Educational Technology			5						5	Considered effective in educational technology and training classes. To be located in the AV Section for proper operation and maintenance and will be rented out whenever necessary.
2.2	Software:													
2.21	Windows 2000 / XP	5	set	ETE001 Educational Technology			5						5	Considered effective in educational technology and training classes. To be located in the AV Section for proper operation and maintenance and will be rented out whenever necessary.
2.22	Video Editing Software (Beginner level)	5	set	ETE001 Educational Technology			5						5	Ditto
2.23	Video Editing Software (Intermediate level)	5	set	ETE001 Educational Technology			5						5	Ditto
2.24	Graphic & Photo Work Software	5	set	ETE001 Educational Technology			5						5	Ditto
2.25	DTP Software	5	set	ETE001 Educational Technology			5						5	Ditto
2.26	Microsoft Office	5	set	ETE001 Educational Technology			5						5	Ditto
2.27	Power Point	5	set	ETE001 Educational Technology			5						5	Ditto
2.3	Digital video recorder/player	1	unit	ETE001 Educational Technology			1						1	Ditto
2.4	TV Monitor for Digital Video Recorder/player	1	unit	ETE001 Educational Technology			1						1	Ditto
2.5	Scanner	1	unit	ETE001 Educational Technology			1						1	Ditto
2.6	Laser Printer	1	unit	ETE001 Educational Technology			1						1	Ditto
2.7	Headphone	5	units	ETE001 Educational Technology			5						5	Ditto
2.8	UPS	5	units	ETE001 Educational Technology			5						5	Ditto
2.9	Table & Chair for Computers	5	set	ETE001 Educational Technology			5						5	Ditto
2.10	Table/rack	1	lot	ETE001 Educational Technology			1						1	Ditto
2.11	Steel Cabinet	1	lot	ETE001 Educational Technology			1						1	Ditto
3	Video Shooting for AV Section													
3.1	Digital Video Camera with accessories	2	unit	For common use			2						2	Two sets are necessary for shooting classes since shooting will be done from 2 angles.
3.11	Spare Charger	1	unit	For common use			1						1	Necessary for shooting as auxiliary item.
3.12	Spare Battery	4	unit	For common use			4						4	Ditto
3.3	Rain Cover for Digital Video Camera	2	unit	For common use			2						2	Ditto
3.4	Tripod	2	unit	For common use			2						2	Ditto
3.5	Carrying Case	2	unit	For common use			2						2	Ditto
4	Non-linear Video Editing & DTP System for AV Section													
4.1	Personal Computer	1	set	For common use			1						1	Two sets will be placed in the AV Section, 1 being for use of Educational Technology classes.
4.2	Software:													
4.21	Windows 2000 / XP	1	set	For common use			1						1	Ditto
4.22	Video Editing Software	1	set	For common use			1						1	To be included in above C-4.2.
4.23	Graphic & Photo Work Software	1	set	For common use			1						1	Ditto
4.24	DTP Software	1	set	For common use			1						1	Ditto
4.25	Microsoft Office	1	set	For common use			1						1	Eliminated: DTP software is not indispensable for AV Section.
4.26	Power Point	1	set	For common use			1						1	To be included in above C-4.2.
4.3	Video Monitor	2	unit	For common use			2						2	Two sets will be placed in the AV Section, 1 being for use of Educational Technology classes.
4.4	Digital video recorder/player	1	unit	For common use			1						1	One set will be planned for editing purpose.
4.5	Analog - Digital converter	1	unit	For common use			1						1	Eliminated: Computer interface function will serve the purpose.
4.6	VHS Recorder/player	1	unit	For common use			1						1	One set will be planned for editing purpose.
4.7	CD/DVD Burner	1	unit	For common use			1						1	Eliminated: Computer interface function will serve the purpose.
4.8	CD/DVD player	1	unit	For common use			1						1	One set will be planned for editing purpose.
4.9	Portable Mini Disc Recorder/player	2	unit	For common use			2						2	Eliminated: Not necessary for editing.
4.10	Portable Cassette Tape Recorder/player	1	unit	For common use			1						1	One set will be planned for editing purpose.
4.11	Scanner	1	unit	For common use			1						1	Ditto
4.12	Laser Printer	1	unit	For common use			1						1	One set will be planned for managing editing works.
4.13	Headphone	1	unit	For common use			1						1	Two sets will be included in above C-4.1.
4.14	UPS	1	unit	For common use			1						1	Two sets will be planned for use with C-4.1.
4.15	Photocopier	1	unit	For common use			1						1	One set is planned for control of rental equipment.
4.16	Table & Chair for Computer	1	set	For common use			1						1	To be prepared by PNG side.
4.17	Table/rack	1	lot	For common use			1						1	Ditto
4.18	Steel Cabinet	1	lot	For common use			1						1	One set is planned for storage of equipment.

Code	Description of Equipment	Qty	Unit	Course	Classification			Purpose of Use				Planned Qty			Subject Investigated	
					R	A	N	N	A	B	C	Y	S	E		V
5	Tool & Instruments for Maintenance Work															
5.1	Cathode Ray Oscilloscope	1	unit	AV Section (maintenance)											1	Indispensable item for maintenance of the equipment.
5.2	Digital Multimeter	3	unit	AV Section (maintenance)											2	Indispensable. One each for 2 AV engineers.
5.3	Digital LCR meter	1	unit	AV Section (maintenance)											1	Indispensable item for maintenance of the equipment.
5.4	Color Picture Tube Rejuvenator	1	unit	AV Section (maintenance)											1	Ditto
5.5	High Wattage Soldering Station	2	unit	AV Section (maintenance)											2	Indispensable. One each for 2 AV engineers.
5.6	Isolation Transformer	1	unit	AV Section (maintenance)											1	Indispensable item for maintenance of the equipment.
5.7	High Voltage Probe	1	unit	AV Section (maintenance)											1	Ditto
5.8	Color TV Pattern Generator	1	unit	AV Section (maintenance)											1	Ditto
5.9	L.O.P.T. Tester	1	unit	AV Section (maintenance)											1	Ditto
5.10	Degaussing Wand	2	unit	AV Section (maintenance)											2	Indispensable. One each for 2 AV engineers.
5.11	Video Service Tool Kit	2	unit	AV Section (maintenance)											2	Ditto
5.12	Video Head Extractor Tool	1	unit	AV Section (maintenance)											1	Indispensable. To be included in C-5.13.
5.13	Video Head Tester	1	unit	AV Section (maintenance)											1	Indispensable item for maintenance of the equipment.
5.14	Video Alignment Tools	1	unit	AV Section (maintenance)											1	Ditto. To be included in C-5.13.
5.15	Monitor Function Generator	1	unit	AV Section (maintenance)											1	Indispensable item for maintenance of the equipment.
5.16	Data Books	1	set	AV Section (maintenance)											1	Indispensable item for maintenance of the equipment.
	1) Diode Manual	1	set	AV Section (maintenance)											1	To be included in C-5.16 above.
	2) Transistor Manual	1	set	AV Section (maintenance)											1	Ditto
	3) Transistor Substitution	1	set	AV Section (maintenance)											1	Ditto
	4) The C-MOS IC Manual	1	set	AV Section (maintenance)											1	Ditto
	5) The Linear IC Manual	1	set	AV Section (maintenance)											1	Ditto
	6) Towers Transistor Selector	1	set	AV Section (maintenance)											1	Ditto
	7) Semiconductor World Data Book (vol. 182)	1	set	AV Section (maintenance)											1	Ditto
5.17	Other necessary Data Books for PC repair or IC	1	lot	AV Section (maintenance)											1	Necessary for safe keeping of tools and instruments.
5.18	Work Bench	1	lot	AV Section (maintenance)											1	Necessary for routine maintenance works.
6	AV Equipment for Common Use															
6.1	Computer	4	unit	AV Section (store)											2	Two sets will be planned for common use. To be located in the New Lecture Room (K-1).
6.2	Multimedia Projector	4	unit	AV Section (store)											2	Ditto
6.3	3D Object Presenter	2	unit	AV Section (store)											2	Eliminated. Considered less frequent use.
6.4	Digital Camera	2	unit	AV Section (store)											2	Two sets will be planned for common use on sharing basis among the departments.
6.6	Digital Video Player	2	unit	AV Section (store)											2	Eliminated. To make use of the one in the AV Section.
6.5	CD/DVD Player	2	unit	AV Section (store)											2	Two sets will be planned for common use on sharing basis among the departments.
6.7	TV Monitor	2	unit	AV Section (store)											2	Eliminated. Projectors (C-6.2) will serve the purpose.
6.8	Extension power reel	5	unit	AV Section (store)											3	Two sets will be planned for common use on sharing basis among the departments.
6.9	Carrying Case	5	unit	AV Section (store)											5	To be included in the respective equipment.
6.10	VHS Video Player	0	unit	AV Section (store)											2	Two sets will be planned for common use on sharing basis among the departments.
6.11	Screen	0	unit	AV Section (store)											2	Ditto
7	Recording & Distribution of Educational TV Programs															
7.1	Satellite TV Dish	2	set	AV Section (maintenance)											1	One set to receive the "Discovery" channel will be planned.
7.2	Decoder	3	unit	AV Section (maintenance)											3	One set will be included in above C-7.1.
7.3	S-VHS Video Recorder/Player	3	unit	AV Section (maintenance)											2	One set to record the educational programs will be planned.
8	Equipment for Primary Section															
1	Offset press, A3 size, single-color	1	unit	Primary Section											1	To meet the overboarded demand for printing, 1 additional set is indispensable. To be located in the New Primary Section.
2	Dark room camera (Graphic camera)	1	unit	Primary Section											1	Indispensable for pre-printing process. One set is planned.
3	Plate Maker (Exposure system)	1	unit	Primary Section											1	Ditto
4	Electric Guillotine	1	unit	Primary Section											1	Indispensable for post-printing process. One set is planned.
5	Electric Stapler	1	unit	Primary Section											1	Ditto
6	Thermal Book Binder	1	unit	Primary Section											1	Ditto
7	Paper Folder	1	unit	Primary Section											1	Ditto
8	Paper Sorter	1	unit	Primary Section											1	Ditto
9	Digital Stencil Duplicator	1	unit	Primary Section											1	Necessary for printing small quantity of teaching materials.
10	Photocopy, Heavy duty	1	unit	Primary Section											1	Ditto

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					R	A	N			ion	Value	Planned Qty	
11	Work Bench	1	lot	Primary Section									Indispensable for pre-printing process. One set is planned.
12	Shelves	1	lot	Primary Section									To be prepared by PNG side.
13	Computer	0	unit	Primary Section									One set will be planned solely for preparation of printing materials.
	Equipment for Language Laboratory, Dept of Language & English												
1	Students' Self-learning system for tutorial class	30	unit	HCOS002 Communication Skills									To provide approx. 150 student with opportunity to learn foreign languages for 2-3 hours a week. 30 sets will be planned.
2	TV monitor	1	unit	HLIN110 Introduction to English Grammar, etc.									To use the equipment placed in the AV Section for common use.
3	VHS Video Recorder/Player	1	unit	HLIN110 Introduction to English Grammar, etc.									Ditto
4	DVD/CD Player	1	unit	HLIN110 Introduction to English Grammar, etc.									Ditto
5	Sheet Cabinet for TV, VTR	1	unit	HLIN110 Introduction to English Grammar, etc.									Ditto
6	OHP	3	unit	HCOS002 Communication Skills									One set each for 3 classrooms will be planned.
7	Projector Screen, Movable	3	unit	HCOS002 Communication Skills									Ditto
8	Cassette Tape Player, Portable	3	unit	HCOS002 Communication Skills									Ditto
9	Digital Video Camera with stand for peer-teaching	1	unit	HLIN110 Introduction to English Grammar, etc.									To use the equipment placed in the AV Section for common use.
	Equipment for Educational Technology, Dept of Educational Technology												
1	TV Monitor	2	unit	ETE001 Educational Technology									To use the equipment placed in the AV Section for common use.
2	Over-Head Projector	3	unit	ETE001 Educational Technology									Ditto
3	Electronic Stencil Cutter	3	unit	ETE001 Educational Technology									Ditto
4	Electronic Stencil Duplicating Machine	2	unit	ETE001 Educational Technology									Ditto
5	Video Player	4	unit	ETE001 Educational Technology									Ditto
6	Slide Projector with magazine	5	unit	ETE001 Educational Technology									Ditto
7	Stereo Amplifier	1	unit	ETE001 Educational Technology									Ditto
8	Double Deck Cassette Player	1	unit	ETE001 Educational Technology									Ditto
9	CD Player	1	unit	ETE001 Educational Technology									Ditto
10	Heavy Duty Photocopier	1	unit	ETE001 Educational Technology									Ditto
	Equipment for Computer Laboratories												
1	New Open Computer Laboratory												
1.1	Personal Computer with monitor	60	set	Open computer lab.									In consideration of gender balance, a new computer lab. for female students is planned with 60 sets of computers.
1.11	Personal Computer for server	1	set	Open computer lab.									A file server is indispensable for above computer lab. (G-1.1).
1.2	Software:												
1.21	Windows 2000 professional	60	set	Open computer lab.									To be included in above G-1.1.
1.22	Microsoft Office	60	set	Open computer lab.									Ditto
1.23	Anti Virus Software	60	set	Open computer lab.									Ditto
1.24	SPPS(Statistics)	10	set	Open computer lab.									To use the one existing in the Library.
1.25	Windows Server	1	set	Open computer lab.									To be included in above G-1.11.
1.3	Equipment/Materials for Network system:												One lot of installation materials is planned.
1.31	Network Cable	700	m	Open computer lab.									To be included in G-1.3
1.32	RJ 45 plug	130	pc	Open computer lab.									130 Ditto
1.33	Network point (wall mount)	60	pc	Open computer lab.									60 Ditto
1.34	Switch (HUB) - 24 port	2	unit	Open computer lab.									Ditto
1.35	Switch (HUB) - 16 port	2	unit	Open computer lab.									Ditto
1.36	UPS	2	unit	Open computer lab.									Ditto
1.4	Laser Printer	2	unit	Open computer lab.									Two printers for common use are planned.
1.5	Scanner	1	unit	Open computer lab.									One scanner is planned for common use.
1.6	UPS	60	unit	Open computer lab.									One set each for G-1.1 with surge protection function is planned.
1.7	AVR	1	unit	Open computer lab.									For surge protection. This function shall be included in the G-1.6.
1.8	Air Conditioner, Separate type	2	unit	Open computer lab.									2 Eliminated. Air conditioner is not necessary.
1.9	Security system	1	set	Open computer lab.									Security system will be introduced in this lab.
2	Teaching Computer Laboratory, Dept of Maths & Computing												
2.1	LCD Projector	1	unit	Teaching lab.									To use the equipment placed in the AV Section for common use.
2.2	Projector Screen, Movable	1	unit	Teaching lab.									Ditto
2.3	AVR	1	unit	Teaching lab.									To be prepared by PNG side.
2.4	Security system	1	set	Teaching lab.									Ditto

Code	Description of Equipment	Qty	Unit	Course	Classification			Purpose of Use	Need	Suitability			Subject Investigated
					R	A	N			ly	on	Planned Qty	
										A	B	C	
3	Male Open Computer Laboratory												
3.1	AVR	1	unit	Common use			1	x	x			1	To be prepared by PNG side.
3.2	Air Conditioner, Separate type	1	unit	Common use			1	x	x			1	Ditto
3.3	Security system	1	set	Common use			1	x	x			1	Ditto
4	Female Open Computer Laboratory												
4.1	AVR	1	unit	Common use			1	x	x			1	To be prepared by PNG side.
4.2	Air Conditioner, Separate type	1	unit	Common use			1	x	x			1	Ditto
4.3	Security system	1	set	Common use			1	x	x			1	Ditto
5	IT ROOM												
5.1	UTP Cable(CAT5) Tester	1	unit	IT Section			1					1	Necessary for network maintenance and 1 set is planned.
5.2	Fiber Optic Cable Tester	1	unit	IT Section			1					1	Ditto
5.3	UPS for Data servers	3	unit	IT Section			3					3	Three sets are planned to avoid adverse affects on computer labs.
5.4	Air compressor	2	unit	IT Section			2	x	x			1	Eliminated in consideration of less frequent use. To use the one in other departments.
5.5	Switch (HUB) - 16 port	4	unit	IT Section			1					4	With setting up of a new computer lab, a server will be located in this section with switching hubs to cover all 4 labs
5.6	Windows Personal Computer for server	1	unit	IT Section			1					1	Ditto
6	Equipment for Expressive Arts Education (Music Section, Dept. of Ex. Arts & Rec. Education)												
1	Music Instruments												
1.1	Trombone	1	unit	HEXA011 Expressive Arts I, etc.								1	Students are required to master the keyboard instrument plus at least one more musical instrument. This course needs 2 trombone and 1 set will be planned in addition to the existing 1 (operational).
1.2	Trumpet	3	unit	HEXA011 Expressive Arts I, etc.			1					3	Three sets are needed in addition to the existing operational 1 set.
1.3	Cornet	2	unit	HEXA011 Expressive Arts I, etc.			2					2	Two sets will be planned.
1.4	Alto sax	4	unit	HEXA011 Expressive Arts I, etc.			4					4	Four sets will be planned.
1.5	Tenor sax	4	unit	HEXA011 Expressive Arts I, etc.			4					4	Ditto
1.6	Clarinet	3	unit	HEXA011 Expressive Arts I, etc.			1					3	Three sets are needed to replace the existing non-operational one.
1.7	Flute	4	unit	HEXA011 Expressive Arts I, etc.			4					4	Four sets will be planned.
1.8	Violin	2	unit	HEXA011 Expressive Arts I, etc.			2					2	Two sets will be planned.
1.9	Electric Guitar	1	unit	HEXA011 Expressive Arts I, etc.			1					1	One set is needed in addition to the existing operational 1 set.
1.10	Bass Guitar	1	unit	HEXA011 Expressive Arts I, etc.			1					1	Ditto
1.11	Lead Guitar Amp	1	unit	HEXA011 Expressive Arts I, etc.			1					1	To be included in above H-1.9.
1.12	Bass Guitar Amp	1	unit	HEXA011 Expressive Arts I, etc.			1					1	Ditto
1.13	Drum Kit	1	set	HEXA011 Expressive Arts I, etc.			1					1	One set is needed to replace the existing non-operational one.
1.14	Music Stand	20	unit	HEXA011 Expressive Arts I, etc.			20					20	Twenty sets are planned to meet all playing parts.
1.15	Digital Piano with stand for classroom (student use)	12	unit	HEXA011 Expressive Arts I, etc.			12					12	Twelve sets for student use are planned in consideration of space
1.16	Piano Seat-Padded regular	13	unit	HEXA011 Expressive Arts I, etc.			13					13	Thirteen sets are planned to use with H-1.15 and H-1.17.
1.17	Digital Piano with stand- Portable type for classroom (teacher use) & live application	1	unit	HEXA011 Expressive Arts I, etc.			1					1	One set for teacher use is planned.
1.18	Electronic Synthesizer for live application (e)	1	unit	GEA322 Music, etc.								1	One set with piano and organ sounds is planned for musical performance and joint recital.
1.19	Electronic Synthesizer for live application (b)	1	unit	GEA322 Music, etc.								1	One set with orchestral and environmental sound is planned for musical performance and joint recital.
1.20	Power Amp	1	unit	HEXA111 Expressive Arts I, etc.								1	Necessary for use with H-1.18 etc.
1.21	16 Channel Mixer	1	unit	HEXA111 Expressive Arts I, etc.			1					1	Ditto
2	Music Composition												
2.1	Digital Sound Recorder (DAT)	1	unit	GEA321 Music Major, etc.			1	x	x			1	Eliminated: Not indispensable for music education.
2.2	Monitor Speakers - studio application	1	set	GEA321 Music Major, etc.			1	x	x			1	Ditto
2.3	Computer for Music composition	4	unit	GEA321 Music Major, etc.			4					4	Four sets will be planned for a small class practices.
2.4	Electric Keyboard for Music composition	4	unit	GEA321 Music Major, etc.			4					4	To be included in above H-2.3.
2.5	Music Scoring Software	4	unit	GEA321 Music Major, etc.			4					4	Ditto
2.6	Music Recording Software	4	unit	GEA321 Music Major, etc.			4					4	Ditto
2.7	Laser Printer	1	unit	GEA321 Music Major, etc.			1					1	Necessary for printing scores.
2.8	CD Burner	1	unit	GEA321 Music Major, etc.			1					1	To be included in H-2.3.
2.9	Compact Stereo System (CD, DVD, Tape)	1	set	GEA321 Music Major, etc.			1					1	One set is planned for review and recording of performances.
2.10	UPS	4	unit	GEA321 Music Major, etc.			4					4	Four sets are planned to avoid adverse affects on computer labs.
2.11	AVR	1	unit	GEA321 Music Major, etc.			1					1	For surge protection. This function shall be included in above H-2.10.
3	Peer Teaching												
3.1	TV Monitor 25/29 inch	1	unit	Peer teaching in music			1					1	To use the equipment placed in the AV Section for common use
3.2	VHS Video player/recorder	1	unit	Peer teaching in music			1					1	Ditto

Code	Description of Equipment	Qty	Unit	Course	Classification			Purpose of Use	Needs City	Stability			Subject Investigated	
					R	A	N			Planned	City	Value		
										A	B	C		
3.3	Steel Cabinet for TV Video & Stereo system	1	unit	Peer teaching in music				1	To store instruments	o	o	o	1	Ditto
3.4	Digital Video Camera with stand	1	set	Peer teaching in music				1	To shoot pedagogical program	o	o	o	1	Ditto
<b>EQUIPMENT FOR APPLIED SCIENCE COURSES (AGRICULTURE, ANIMAL SCIENCES, PLANT SCIENCES, AND HEALTH)</b>														
<b>GENERAL LABORATORY EQUIPMENT</b>														
1.1	Analytical Lab. Balance	2	set	Soil/Crop/ Animal Sciences, etc.				2	For reagent preparation	o	o	o	2	Indispensable for lab, practical. One table top type is planned respectively for diploma and degree courses.
1.2	Distilled Water/ Demineralized Water Machine	1	unit	Soil/Crop/ Animal Sciences, etc.				1	For general preparation	o	o	o	1	Indispensable for lab, practical. One set is planned for common use.
1.3	Lab Drying Oven	1	unit	Soil/Crop/ Animal Sciences, etc.				1	For general drying purposes	o	o	o	1	Ditto
1.4	Ammonia Distillation Apparatus	1	set	Soil/Crop/ Animal Sciences, etc.				1	For distillation of ammonia in samples	o	o	o	1	Ditto
1.5	Lab Incubator	1	unit	Soil/Crop/ Animal Sciences, etc.				1	To incubate samples	o	o	o	1	Indispensable for lab, practical. One set of table top type is planned for common use.
1.6	Digital Lab. pH Meter	2	set	Soil/Crop/ Animal Sciences, etc.				2	To measure pH value of samples	o	o	o	2	Indispensable for lab, practical. One table top type is planned respectively for diploma and degree courses.
1.7	Desiccators	5	unit	Soil/Crop/ Animal Sciences, etc.				5	For cooling samples	o	o	o	5	Five sets are planned for various types of sample.
1.8	Table Top Centrifuge with Tube	1	unit	Soil/Crop/ Animal Sciences, etc.				1	To extract samples for analysis of chemicals	o	o	o	1	Indispensable for lab, practical. One set of table top type is planned for common use. Two different types of 24 tubes each are to be included as accessories.
1.81	Screw Cap Polypropylene Centrifuge tubes - 50 ml	2	dz	Soil/Crop/ Animal Sciences, etc.				2	For sample collection	o	o	o	2	To be included in above 1-1.8.
1.82	Polypropylene Centrifuge tubes without caps - 50 ml	2	dz	Soil/Crop/ Animal Sciences, etc.				2	Ditto	o	o	o	2	Ditto
1.9	Spectrophotometer	2	unit	Soil/Crop/ Animal Sciences, etc.				2	To measure chemical elements in soil and plants	o	o	o	2	Indispensable for lab, practical. One set is planned respectively for diploma and degree courses.
1.10	Vacuum Pressure Pump	1	unit	Soil/Crop/ Animal Sciences, etc.				1	For general lab. works	o	o	o	1	Indispensable for lab, practical. One set is planned for common use.
1.11	Mortar & Pestle	5	set	Soil/Crop/ Animal Sciences, etc.				5	For sample preparation	o	o	o	5	As basic lab. item. 1 set for every 5 students is planned.
1.12	Aluminum Heating Block	1	set	Soil/Crop/ Animal Sciences, etc.				1	For sample heating	o	o	o	1	Indispensable for lab, practical. One set is planned for common use.
1.13	Atomic Absorption Spectrometry	1	unit	Soil/Crop/ Animal Sciences, etc.				1	To measure soil and plant nutrients	x	x	x	1	Eliminated: Technically not viable in consideration of difficulty in operation and maintenance.
1.14	Auto analyzer	1	unit	Soil/Crop/ Animal Sciences, etc.				1	Ditto	x	x	x	1	Ditto
1.15	Conductivity Meter	4	unit	Soil/Crop/ Animal Sciences, etc.				4	To measure ion conductivity in samples	o	o	o	4	Basic item in practical. One set for lab. use and 3 sets for field use (portable type) are to be planned.
1.16	Flame Spectrometry	1	unit	Soil/Crop/ Animal Sciences, etc.				1	For measuring potassium and related elements	o	o	o	1	To use the one planned as J-6.1 on sharing basis.
1.17	Manities	1	unit	Soil/Crop/ Animal Sciences, etc.				1	Sample heating for analysis	o	o	o	1	Indispensable for lab, practical. One set is planned for common use.
1.18	Kjeldahl apparatus	1	unit	Soil/Crop/ Animal Sciences, etc.				1	For nitrogen analysis using Kjeldahl method	o	o	o	1	Ditto
1.19	Liquid Dispensers	5	unit	Soil/Crop/ Animal Sciences, etc.				5	Measuring various laboratory solution (acid/alkaline) for sample preparation and analysis	o	o	o	5	As basic lab. item. 1 set for every 5 students is planned.
1.20	Colorimeters	5	unit	Soil/Crop/ Animal Sciences, etc.				5	For measurement of nutrient elements	o	o	o	5	Ditto
1.21	Peristaltic Pump	1	unit	Soil/Crop/ Animal Sciences, etc.				1	For general laboratory work	o	o	o	1	Indispensable for lab, practical. One set is planned for common use.
1.22	Lab Water baths	1	unit	Soil/Crop/ Animal Sciences, etc.				1	For general laboratory preparation of samples	o	o	o	1	Ditto
1.23	Electronic Microscope	20	unit	Soil/Crop/ Animal Sciences, etc.				20	Analyzing specimens	o	o	o	20	Basic and frequently used equipment. Twenty sets will be planned so that 1-2 students can share 1 set.
1.24	Dissecting/Stereo Microscope	20	unit	Soil/Crop/ Animal Sciences, etc.				20	Dissecting plants, flowers, insects, etc	o	o	o	20	Basic but less frequently used equipment. Ten sets will be planned so that 2-3 students can share 1 set.
1.25	Hand lenses	20	unit	Soil/Crop/ Animal Sciences, etc.				20	For quick viewing of plant parts, micro-organisms, etc	o	o	o	20	As basic lab. item. 20 sets are planned.
1.26	Electric Cork Borer	1	unit	Soil/Crop/ Animal Sciences, etc.				1	For corking holes	o	o	o	1	Indispensable for lab, practical. One set is planned for common use.
1.27	Laboratory Blenders with Timer	1	unit	Soil/Crop/ Animal Sciences, etc.				1	For sample preparation	o	o	o	1	Ditto
1.28	Laboratory Refrigerator	1	unit	Soil/Crop/ Animal Sciences, etc.				1	For sample storage	o	o	o	1	Ditto
1.29	Laboratory Deep Freezer	1	unit	Soil/Crop/ Animal Sciences, etc.				1	Ditto	o	o	o	1	Ditto
2	Equipment for Soil Science and Plant Measurement													
2.1	Soil Bulk Density Cores - Stainless	20	unit	Soil/Crop/ Animal Sciences, etc.				20	Measuring soil bulk density	o	o	o	20	As basic item. 20 sets are planned.
2.2	Rotary Shaker	2	unit	Soil/Crop/ Animal Sciences, etc.				2	Soil sample preparation for nutrient analysis	o	o	o	2	Indispensable for lab, practical. One set is planned respectively for diploma and degree courses.
2.3	Reciprocating Shaker	2	unit	Soil/Crop/ Animal Sciences, etc.				2	Soil and plant sample preparation for nutrient	o	o	o	2	Ditto
2.4	Refractometer	5	unit	Soil/Crop/ Animal Sciences, etc.				5	For measuring plant products juices	o	o	o	5	As basic lab. item. 1 set of handy type for every 5 students is planned
2.5	Tullgren Funnels	1	unit	Soil/Crop/ Animal Sciences, etc.				1	For the extraction of soil animals from plant litter and soil	o	o	o	1	Indispensable for lab, practical. One set is planned for common use.
2.6	Salt & Hollick Soil Washing Apparatus	1	unit	Soil/Crop/ Animal Sciences, etc.				1	For extracting active and inactive arthropods from the soil and plant litter	o	o	o	1	Ditto
2.7	Lab Bench Shakers	2	unit	Soil/Crop/ Animal Sciences, etc.				2	For sample preparation for nutrient test	o	o	o	2	Indispensable for lab, practical. One set is planned respectively for diploma and degree courses
2.8	pH Meter	2	unit	Soil/Crop/ Animal Sciences, etc.				2	Measuring pH in micro environment	o	o	o	2	Indispensable for lab, practical. One handy type set is planned respectively for diploma and degree courses.

Code	Description of Equipment	Qty	Unit	Course	Classification			Purpose of Use	Needs, Suitability, Evaluability			Planned Qty			Subject Investigated
					R	A	N		o	c	o	o	A	B	
2.9	Ion Analyzer	1	unit	Soil/Crop/ Animal Sciences, etc.			1	Analyzing ions present in plant and soil samples.	o	o	o	1		Indispensable for lab. practical. One set is planned for common use.	
2.10	Soil Sieve Sets	1	set	Soil/Crop/ Animal Sciences, etc.			1	For soil particle analysis	o	o	o	1		Ditto	
2.11	Standard Test Sieve Shaker	1	set	Soil/Crop/ Animal Sciences, etc.			1	For shaking soil particles into different sizes using sieve sizes	o	o	o	1		Ditto	
2.12	Water quality Analyzer	2	unit	Soil/Crop/ Animal Sciences, etc.			2	Measuring water samples for nutrient pollution in streams or ponds	o	o	o	2		Indispensable for lab. practical. One set is planned respectively for diploma and degree courses.	
2.13	Hygothermograph	2	unit	Soil/Crop/ Animal Sciences, etc.			2	Measuring temperature & relative humidity	o	o	o	2		Ditto	
2.14	Thermograph	2	unit	Soil/Crop/ Animal Sciences, etc.			2	Measuring and recording air and soil temperature	o	o	o	2		Two sets are planned to be located separately in the training farm.	
2.15	Soil Density Hydrometers	5	unit	Soil/Crop/ Animal Sciences, etc.			5	Measuring soil density	o	o	o	5		Indispensable for practical. Five sets are planned for common use.	
2.16	Soil Thermometers	10	unit	Soil/Crop/ Animal Sciences, etc.			10	Measuring soil temperatures	o	o	o	10		Indispensable for practical. Ten sets are planned for common use.	
2.17	Fruit Gauge	5	set	Crop Science, etc.			5	Measuring fruit sizes of various fruit crops	o	o	o	5		Indispensable for practical. Five sets are planned for common use.	
2.18	Electronic Dendrometer	5	unit	Crop Science, etc.			5	Measuring fruit and stem growth of most crops	o	o	o	5		Ditto	
2.19	Chlorophyll Meter	5	unit	Soil/Crop/ Animal Sciences, etc.			5	Measuring amount of chlorophyll	o	o	o	5		Indispensable for practical. Five handy type sets are planned for	
2.20	Permeameter, Guelph type	5	unit	Soil/Crop/ Animal Sciences, etc.			5	Measuring soil hydraulic conductivity, soil sorptivity, soil matrix flux potential	o	o	o	5		Ditto	
2.21	Permeameter, Shelby Tube	5	unit	Soil/Crop/ Animal Sciences, etc.			5	Measuring soil permeability on undisturbed soils	o	o	o	5		To be included in above 1-2,20.	
2.22	Permeameter, Combination type	5	unit	Soil/Crop/ Animal Sciences, etc.			5	Measuring soil permeability in controlled	o	o	o	5		Ditto	
2.23	Soil Compaction Permeameter	5	unit	Soil/Crop/ Animal Sciences, etc.			5	Measuring flow of water in the soil	o	o	o	5		Indispensable for practical. Five sets are planned for common use.	
2.24	Soil Infiltrometer	5	unit	Soil/Crop/ Animal Sciences, etc.			5	Measuring soil infiltration rate	o	o	o	5		Ditto	
2.25	Soil Tensiometer	5	unit	Soil/Crop/ Animal Sciences, etc.			5	Soil moisture potential	o	o	o	5		Ditto	
2.26	Capacitance Probe	5	unit	Soil/Crop/ Animal Sciences, etc.			5	Measuring volumetric water content in the field of crops	o	o	o	5		Ditto	
2.27	Time Domain Reflectometry System	5	unit	Soil/Crop/ Animal Sciences, etc.			5	Measuring volumetric water content in soils	o	o	o	5		Ditto	
2.28	Penetrometer, Static Cone	5	unit	Soil/Crop/ Animal Sciences, etc.			5	Measuring soil consistency & soil compaction	o	o	o	5		Ditto	
2.29	Pressure Extractors	5	unit	Soil/Crop/ Animal Sciences, etc.			5	Measuring water holding capacity of soils	o	o	o	5		Ditto	
2.30	Soil Temperature and Water Potentialmeter	5	unit	Soil/Crop/ Animal Sciences, etc.			5	Measuring soil temperature and water potential	o	o	o	5		Ditto	
2.31	Munsell Soil Color Charts	30	set	Soil/Crop/ Animal Sciences, etc.			30	Soil color description in soil profile	o	o	o	30		Indispensable and frequently used in practical and classes. Thirty sets are planned for common use.	
2.32	Wind speed anemometers	5	set	Soil/Crop/ Animal Sciences, etc.			5	Measuring wind speed	o	o	o	5		Two sets are planned to be located separately in the training farm.	
2.33	Soil Core Sampler	5	set	Soil/Crop/ Animal Sciences, etc.			5	Collecting soil samples at various depth for nutrient analysis	o	o	o	5		Indispensable for practical. Five sets are planned for common use.	
2.34	Soil Sampling augers	5	set	Soil/Crop/ Animal Sciences, etc.			5	Collecting soil samples for soil nutrient analysis	o	o	o	5		Ditto	
2.35	Environmental Monitoring Equipment	2	unit	Soil/Crop/ Animal Sciences, etc.			2	Mainly for environment purposes particularly for nutrient pollution	o	o	o	2		One set is planned to be located in the training farm.	
3	LABORATORY GLASSWARE	1	lot	Soil/Crop/ Animal Sciences, etc.			1	For general lab. use	x	x	x	1		Necessary glassware is included in the planned equipment. The rest are to be prepared by PNG side.	
4	LABORATORY CONSUMABLES	1	lot	Soil/Crop/ Animal Sciences, etc.			1	Ditto	x	x	x	1		Necessary chemicals/reagents are included in the planned equipment. The rest are to be prepared by PNG side.	
5	EQUIPMENT FOR LECTURE & PRACTICAL PRESENTATION														
5.1	TV Monitor 25 inch	1	unit	Common use			1	To view educational programs	o	o	o	1		To use those AV equipment for common use, located in the AV lecture room or in the AV section for rental.	
5.2	VHS Video Player	1	unit	Common use			1	Ditto	o	o	o	1		Ditto	
5.3	Steel Cabinet for the above	1	unit	Common use			1	To store AV equipment	o	o	o	1		Ditto	
5.4	Slide Projector	1	unit	Common use			1	For slide presentation during lectures or	o	o	o	1		Ditto	
5.5	Over Head Projector	3	unit	Common use			3	For lecture & practical presentation	o	o	o	3		Ditto	
5.6	Projector Screen, Movable	1	unit	Common use			1	Ditto	o	o	o	1		Ditto	
5.7	Digital Camera	1	unit	Common use			1	Taking pictures and writing course materials	o	o	o	1		Ditto	
5.8	Digital Video Camera with stand for peer teaching	1	unit	Common use			1	To shoot classes for peer teaching	o	o	o	1		Ditto	
6	MODEL FARM EQUIPMENT & FACILITIES														
6.1	Tractor with PTO & Attachments	1	unit	SAGE221 Crop production, etc.			1	Land preparation for student practical on vegetable or crop production	o	o	o	1		Indispensable for land preparation in the farm. One set with power take-off attachments is planned.	
6.11	Trailer	1	unit	SAGE221 Crop production, etc.			1	Ditto	o	o	o	1		Indispensable for land preparation in the farm. One set is planned.	
6.12	Disc plough	1	unit	SAGE221 Crop production, etc.			1	Ditto	o	o	o	1		Ditto	
6.13	Disc harrow	1	unit	SAGE221 Crop production, etc.			1	Ditto	o	o	o	1		Ditto	
6.14	Mould board plough	1	unit	SAGE221 Crop production, etc.			1	Ditto	o	o	o	1		Ditto	
6.15	Rotary disk mower	1	unit	SAGE221 Crop production, etc.			1	Farm slashing	o	o	o	1		Ditto	
6.2	Generator 5kva - diesel	1	unit	SAGE221 Crop production, etc.			1	Farm electrical work	o	o	o	1		One set is planned as a power source in the field	
6.3	Portable lawn mower	1	unit	SAGE221 Crop production, etc.			1	For farm lawn cutting	o	o	o	1		One set is planned for grass cutting in the field.	
6.4	Water pump - diesel	1	unit	SAGE221 Crop production, etc.			1	Pump water for watering and irrigation	o	o	o	1		One set is planned for irrigating farm land.	
6.5	Irrigation hose - standard size attached to pump	2	set	SAGE221 Crop production, etc.			2	For irrigation of crops	o	o	o	2		To be included in above 1-6.4.	



Code	Description of Equipment	Qty	Unit	Course	Classification		Purpose of Use	Necessity				Subject Investigated
					R	A		Essentiality	Suitability	Frequency	Planned Qty	
6.6	Irrigation Sprinklers	20	set	SAGE221 Crop production, etc.		20	For watering of crops	o	o	o	20	Necessary numbers of nozzle shall be planned as a part of I-6.4
6.7	Poultry house to house broilers, layers, & breeders	1	unit	SAGE221 Crop production, etc.		1	To raise chicken	x	x	x	1	To be prepared by PNG side.
6.8	Pig unit to house breeders, weaners, piglets	1	unit	SAGE221 Crop production, etc.		1	To raise pigs	x	x	x	1	Ditto
6.9	Nursery house (Nethouse)	1	unit	SAGE221 Crop production, etc.		1	To grow seedlings/springs, etc.	x	x	x	1	Ditto
6.10	Storage refrigerator - standard	1	unit	SAGE221 Crop production, etc.		1	Sample storage	o	o	o	1	One set is planned for storing crop samples.
6.11	Storage freezer - standard	1	unit	SAGE221 Crop production, etc.		1	Ditto	o	o	o	1	Ditto
6.12	Tools kit for maintenance of farm machinery	1	unit	SAGE221 Crop production, etc.		1	Tools for machine shop	o	o	o	1	Indispensable for maintenance. One set is planned.
6.13	Coffee pulper	5	unit	SAGE221 Crop production, etc.		5	Pulping coffee cherry	x	x	x	5	Eliminated. No practice is done in campus.
6.14	Rice milling machine	2	unit	SAGE221 Crop production, etc.		2	For milling rice	o	o	o	2	Two sets are planned for basic practical.
6.15	Hanging Scales - 50kg capacity	4	unit	SAGE221 Crop production, etc.		4	Weighing crop yield, animal feed etc	o	o	o	2	Ditto
6.16	Weighing scale for animals	5	unit	SAGE221 Crop production, etc.		5	Life weight measurement for pigs, goat & sheep	o	o	o	3	Ditto
6.17	Hammer mill	1	unit	SAGE221 Crop production, etc.		1	Crushing animal feed	o	o	o	1	One set is planned for feed preparation.
6.18	Animal Feed mill/grinder	1	unit	SAGE221 Crop production, etc.		1	Grinding animal feed	o	o	o	1	Ditto
6.19	Feed palletizer	1	unit	SAGE221 Crop production, etc.		1	Making feed pallet	o	o	o	1	Ditto
6.20	Feeding bins	10	unit	SAGE221 Crop production, etc.		10	Storage bins for feeds	o	o	o	10	One set is planned for feed storage
6.21	Feeding bucket	10	unit	SAGE221 Crop production, etc.		10	Carrying feed to animals	o	o	o	10	One set is planned for carrying feed.
6.22	Ear tag applicator	2	unit	SAGE221 Crop production, etc.		2	Tagging tags on ears of animals	o	o	o	2	Two sets are planned for common practical.
6.23	Metal cages	5	unit	SAGE221 Crop production, etc.		5	Metabolism measurement of animals used for animal courses	o	o	o	5	Five sets are planned for housing animals.
6.24	Emasculator	2	unit	SAGE221 Crop production, etc.		2	Used for castration	o	o	o	2	Two sets are planned for common practical.
6.25	Tape measure - 5 m, 30m, 100m	2	each	SAGE221 Crop production, etc.		2	Farm measurement	o	o	o	2	Ditto
1	Measuring Instruments (Common Use)											
1.1	Balance - Electronic Balance	2	unit	SBIO101 Introductory Biology, etc.		2	For measuring samples, reagents etc.	o	o	o	6	Indispensable and frequently used in practical. Two sets each of J-1.1, J-1.2 and J-1.3 are planned for common use.
1.2	Balance - Electronic Semi micro/microbalance	2	unit	SBIO101 Introductory Biology, etc.		2	Ditto	o	o	o	2	To be included in above J-1.1.
1.3	Balance - Electronic Analytical Balance	2	unit	SBIO101 Introductory Biology, etc.		2	Ditto	o	o	o	2	Ditto
1.4	pH meter - Bench	2	unit	SBIO101 Introductory Biology, etc.		1	To measure pH value of samples	o	o	o	4	Indispensable and frequently used in practical. Two sets each of J-1.4 and J-1.5 are planned for common use, together with J-1.5 and J-1.6.
1.5	pH meter - Hand held	2	unit	SBIO101 Introductory Biology, etc.		2	Ditto	o	o	o	2	To be included in above J-1.4.
1.6	Spare electrodes (pH)	4	unit	SBIO101 Introductory Biology, etc.		4	Spare electrodes	o	o	o	4	Ditto
1.7	pH Calibration Kit	5	unit	SBIO101 Introductory Biology, etc.		5	Calibration kit for pH meter	o	o	o	4	Ditto
1.8	Conductivity Meter	1	unit	SBIO102 Introductory Biology, etc.		1	To measure conductivity of samples	o	o	o	1	Indispensable for lab. practical. One set is planned for common use.
1.9	Digital Hygro-Thermometer	2	unit	SBIO103 Introductory Biology, etc.		2	To measure humidity	o	o	o	2	Indispensable for lab. practical. Two sets are planned for common use.
1.10	Thermometers, Mercury (White)	10	unit	Chemistry, Biology & Biotechnology		10	To measure temperature	o	o	o	10	Indispensable and frequently used in practical. Ten sets with white background are planned together with 10 sets of yellow backgrounds for common use.
1.11	Thermometers, Mercury (Yellow)	10	unit	Chemistry, Biology & Biotechnology		1	Ditto	o	o	o	10	To be included in above J-1.10.
1.12	Automatic Pipette, 1 - 10 µl (Variable volume)	6	unit	Chemistry, Biology & Biotechnology		6	For pipetting reagents, chemicals, etc.	o	o	o	6	Indispensable and frequently used in practical. Six sets each of J-1.12, J-1.13, J-1.14 and J-1.15 are planned for common use, together with 1 set each of J-1.16 to above 4 types of pipette.
1.13	Automatic Pipette, 10 - 100 µl (Variable volume)	6	unit	Chemistry, Biology & Biotechnology		6	Ditto	o	o	o	6	Ditto
1.14	Automatic Pipette, 100 µl - 1000 µl (Variable volume)	6	unit	Chemistry, Biology & Biotechnology		6	Ditto	o	o	o	6	Ditto
1.15	Automatic Pipettes, 1ml - 5 ml (Variable volume)	6	unit	Chemistry, Biology & Biotechnology		6	Ditto	o	o	o	6	Ditto
1.16	Pipette (reusable lips)	6	unit	Chemistry, Biology & Biotechnology		6	Ditto	o	o	o	4	Ditto
2	Analytical Instrument/Common Use											
2.1	Spectrophotometer	4	unit	SBIO101 Introductory Biology, etc.		1	For qualitative and quantitative determination of protein etc.	o	o	o	4	Necessary to teach basic spectrophotometry. Four sets of analog type shall be planned (including 1 set for replacement of existing one) for common use by Agriculture and Science related labs.
2.2	UV-VIS Spectrophotometer	1	unit	SBIO101 Introductory Biology, etc.		1	Ditto	o	o	o	1	Necessary to teach basic spectrophotometry. One set for common use by Agriculture and Science related labs is planned.
3	Chromatography & Electrophoresis/Common Use											
3.1	Paper Chromatography	4	unit	SBIO101 Introductory Biology, etc.		4	To teach basic principle of paper chromatography by separating and identifying	o	o	o	4	Necessary to teach basic chromatography. Two sets each for Biology Lab. and Chemistry Lab. will be planned.
3.11	Chromatography paper, grade 1, 59cm Roll	1	roll	SBIO101 Introductory Biology, etc.		1	Paper for chromatography	o	o	o	1	To be included in above J-3.1.
3.12	Chromatography paper, grade 1, 100cm Roll	1	roll	SBIO101 Introductory Biology, etc.		1	Ditto	x	x	x	1	Ditto
3.13	Chromatography paper, grade 1, 300 sheets	1	set	SBIO101 Introductory Biology, etc.		1	Ditto	o	o	o	1	Ditto
3.2	Thin Layer Chromatography	1	unit	SBIO101 Introductory Biology, etc.		1	To teach basic principle of thin layer chromatography by separating and identifying	o	o	o	1	Necessary to teach basic chromatography. One set each for Biology Lab. and Chemistry Lab. will be planned.
3.21	Chromatography column	6	unit	SBIO101 Introductory Biology, etc.		6	Auxiliary item for 3.2	x	x	x	6	Column is not needed.
3.22	Chromatography Jar	6	unit	SBIO101 Introductory Biology, etc.		6	Ditto	o	o	o	5	To be included in above J-3.2 as standard accessory.

Code	Description of Equipment	Qty	Unit	Course	Classification			Purpose of Use	Necessity	Stability/Evaluation			Planned Qty	Subject Investigated
					R	A	N			A	B	C		
3.23	Chromatography spray gun	6	unit	S BIO101: Introductory Biology, etc.			6					5	Ditto	
3.3	Electrophoresis	1	set	S BIO101: Introductory Biology, etc.			1					1	As a basic lab. Equipment, 1 set is planned for common use of relevant labs.	
4	General Instrument / Common Use													
4.1	Bunsen Burner (Universal/general purpose)	25	unit	Common in Chemistry/Biology	17	8						25	Existing ones need to be replaced. Twenty five sets will be planned as general lab. instrument.	
4.2	Auto Vortex Variable speed mixer	2	unit	Common in Chemistry/Biology			2					2	Indispensable for practical. One set each for Biology Lab. and Chemistry Lab. will be planned.	
4.3	Blender	2	unit	Common in Chemistry/Biology			2					2	Ditto	
4.4	Homogeniser	2	unit	Common in Chemistry/Biology			2					2	Ditto	
4.5	Magnetic Stirrer with Hot Plate	1	unit	Common in Chemistry/Biology			1					1	Indispensable for practical. One set is planned as replacement of old one.	
4.6	Magnetic Stirrer	2	unit	Common in Chemistry/Biology			2					2	To be included in above J-4.5.	
4.6.1	Stirrer Bars	10	each	Common in Chemistry/Biology			10					10	Ditto	
4.7	Stirred Water baths	2	unit	Common in Chemistry/Biology	1	1	2					2	Indispensable for practical. One set each for Biology Lab. and Chemistry Lab. will be planned. One set is a replacement of one.	
4.8	Centrifuge - Bench Top	2	unit	Common in Chemistry/Biology			2					2	Indispensable for practical. One set each for Biology Lab. and Chemistry Lab. will be planned, together with 100 tubes respectively.	
4.9	Universal Refrigerated Centrifuge with Swing Rotor	1	unit	Common in Chemistry/Biology			1					1	One set is planned for common use of related labs.	
4.9.1	Rotor and 50 ml tubes	1	unit	Common in Chemistry/Biology			1					1	Ditto	
4.9.2	Rotor and 15 ml Tubes	1	unit	Common in Chemistry/Biology			1					1	Ditto	
4.10	Distilled water/ Deionised Water Machine	2	unit	Common in Chemistry/Biology	1	1						2	Existing one needs replacement. In consideration of frequent use, 1 set each is planned for Biology Lab. and Chemistry Lab.	
4.11	Freeze-Dryer	1	unit	Common in Chemistry/Biology			1					1	One set is planned for common use of all related labs.	
4.12	Heating mantles, Fire Resistant	2	unit	Common in Chemistry/Biology	1	1						2	Existing one needs replacement. In consideration of frequent use, 2sets are planned for common use of Biology Lab. and Chemistry Lab.	
4.13	Incubator	2	unit	Common in Chemistry/Biology	1	1						2	Indispensable for practical. In consideration of frequent use, 2sets are planned for common use of Biology Lab. and Chemistry Lab.	
4.14	Laboratory Furnace	1	unit	Common in Chemistry/Biology			1					1	One set is planned for common use of related labs.	
4.15	Oven	1	unit	Common in Chemistry/Biology			1					1	Existing one needs replacement. One set is planned for common use of related labs.	
4.16	Refrigerator	2	unit	Common in Chemistry/Biology	2							2	Existing 2 sets need replacement. One set each is planned for Biology Lab. and Chemistry Lab. respectively.	
4.17	Deep Freezer (-20 °C)	1	unit	Common in Chemistry/Biology	1							1	One set is planned for common use of related labs.	
4.18	Microtome Equipment	1	unit	Botany/Biology			1					1	Indispensable for practical. One set is planned common use.	
4.19	Safety Equipment / Common Use	1	unit	Botany/Biology			1					1	To be included in above J-4.18.	
5														
5.1	Disposable Dust Masks	300	pc	Common in Science			300					300	Three hundred sets are planned to cover about 10 classes of practical teaching.	
5.2	Face shield	20	unit	Common in Science			20					20	Twenty sets are planned for common use.	
5.3	Safety Spectacles	60	pc	Common in Science			60					60	Sixty sets are planned to meet 2 classes demands.	
5.4	Lab. coats	60	pc	Common in Science			60					60	Ditto	
5.5	Gloves, Disposable	300	pair	Common in Science			300					300	Three hundred sets are planned to cover about 10 classes of practical teaching.	
5.6	Gloves, Leather	20	pair	Common in Science			20					20	Twenty sets are planned for common use.	
5.7	Gloves, Rubber	20	pair	Common in Science			20					20	Ditto	
5.8	Laboratory First-Aid Chart (for teaching purpose)	3	pc	Common in Science			3					3	One each for 2 Chemistry Labs. and 1 Agriculture Lab. will be planned.	
6	Analytical Instrument/Chemistry & Agriculture													
6.1	Flame Spectrometry	1	unit	Common in Science			1					1	As basic analytical equipment, 1 set is planned for common use of related labs.	
6.2	Gas Chromatography	1	unit	S BIO101: Introductory Biology, etc.			1					1	As basic analytical equipment, 1 set is planned for common use of related labs together with a TCD detector, gas cylinder and other accessories.	
7	Dissecting tools / Biology & Agriculture													
7.1	Dissecting Instrument Set	60	set	Biology/Botany/ Physiology			60					60	Sixty sets with accessories are planned to meet 2 classes demands.	
7.2	Dissecting Board	60	unit	Biology/Botany/ Physiology			60					60	To be included in above J-7.1.	
7.3	Scalpels with disposable blade	100	pc	Biology/Botany/ Physiology			100					100	Ditto	
7.4	General Dissecting Scissors	10	pc	Biology/Botany/ Physiology			10					10	Ditto	
7.5	Surgical Scissors	10	pc	Biology/Botany/ Physiology			10					10	Ditto	
7.6	Sterile Scalpels	10	pc	Biology/Botany/ Physiology			10					10	Ditto	
7.7	Forceps, stainless steel	10	pc	Biology/Botany/ Physiology			10					10	Ditto	
7.8	Dissecting needles, box of 100	10	box	Biology/Botany/ Physiology			10					10	Ditto	

Code	Description of Equipment	Qty	Unit	Course	Classification			Purpose of Use	Necessity	Planned Qty			Subject Investigated
					R	A	N			A	B	C	
8	Microscopes & Optical Instruments/Biology & Agriculture												
8.1	Microscope	25	unit	Biology/Botany/ Physiology, etc.	25			For observation of samples by microscopy	o	o	25		Indispensable for lab, practical. Twenty five sets will be planned for common use of related labs, to replace existing old ones in the Biology Lab, and Chemistry Lab.
8.2	Dissecting microscope	15	unit	Biology/Botany/ Physiology, etc.	15			Ditto	o	o	7	8	Seven sets will be planned in addition to existing 18 sets to meet the demand. As basic lab. items, 25 pieces each will be planned for Biology Lab, and Chemistry Lab, respectively.
8.3	Hand lenses	50	pc	Biology/Botany/ Physiology, etc.				For direct observation of samples	o	o	50		
8.4	Inverted Microscope for Tissue culture	1	unit	Biology/Botany/ Physiology, etc.				For observation of tissue culture samples by microscopy	x	x	x	1	No more required in lab works.
8.5	Microscope, phase contrast with TV system	1	unit	Biology/Botany/ Physiology, etc.				For group observation of samples by microscopy through TV monitor	o	o	1		One set is planned for common use of Biology Lab, and Chemistry Lab.
8.6	Dry Cabinet for Microscopes	2	unit	Biology/Botany/ Physiology, etc.				To store and protect microscopes	o	o	2		In consideration of frequent use, 2sets are planned for common use of Biology Lab, and Chemistry Lab.
9	Microbiology & Tissue Culture/Biology												
9.1	Autoclave	1	unit	Biology/Microbiology, etc.	1			For sterilizing glassware and instruments	o	o	1		Indispensable for lab, practical. One set is planned for common use.
9.2	Tissue Culture Set	1	unit	Microbiology/Histology				To culture microorganism and bacteria	x	x	x	1	No more required in lab works.
9.3	UV Fluorescent tube for Room Sterilization	1	set	Microbiology/Histology				For sterilization of lab.	o	o	1		Indispensable for lab, practical. One set is planned for common use.
9.4	UV lamp	1	pc	Microbiology/Histology				For fluorescence test of samples	o	o	1		Ditto
9.5	Ultrasonic Disintegrator	1	unit	Microbiology/Histology				To prepare samples by fragmenting cells through ultrasonic	o	o	1		Ditto
9.6	Laminar Flow Workstation	1	unit	Microbiology/Histology	1			For handling toxic materials in controlled air flow	o	o	1		Ditto
10	Educational Media/Biology & Agriculture												
10.1	Educational slide set - Botany	1	set	Biology/Agriculture				Teaching slides	o	o	1		As basic teaching material, one full set is planned for common use.
10.2	Educational slide set - Ecology	1	set	Biology/Agriculture				Ditto	o	o	1		Ditto
10.3	Educational slide set - Evolution	1	set	Biology/Agriculture				Ditto	o	o	1		Ditto
10.4	Educational slide set - Zoology	1	set	Biology/Agriculture				Ditto	o	o	1		Ditto
10.5	Educational video films - Animal behavior	1	set	Biology/Agriculture				Teaching video programs	o	o	1		Ditto
10.6	Educational video films - Botany	1	set	Biology/Agriculture				Ditto	o	o	1		Ditto
10.7	Educational video films - Ecology	1	set	Biology/Agriculture				Ditto	o	o	1		Ditto
10.8	Educational video films - Environmental Science	1	set	Biology/Agriculture				Ditto	o	o	1		Ditto
10.9	Educational video films - Evolution	1	set	Biology/Agriculture				Ditto	o	o	1		Ditto
10.10	Educational video films - Zoology	1	set	Biology/Agriculture				Ditto	o	o	1		Ditto
10.11	Microscope Slides Sets	1	set	Biology/Agriculture				Teaching microscopic slides	o	o	1		Ditto
10.12	Microscope Slides Sets	1	set	Biology/Agriculture				Ditto	o	o	1		Ditto
10.13	Chart/Poster - Five Kingdoms of life	1	set	Biology/Agriculture				Educational charts/posters	o	o	1		Ditto
10.14	Chart/Poster - Plant cell structure and Animal cell	1	set	Biology/Agriculture				Ditto	o	o	1		Ditto
10.15	Chart/Poster - Electrophoresis Techniques Reference	1	set	Biology/Agriculture				Ditto	o	o	1		Ditto
10.16	Chart - Cell structure and cell division chart set	1	set	Biology/Agriculture				Ditto	o	o	1		Ditto
10.17	Chart - Botany & Zoology Chart Series set	2	set	Biology/Agriculture				Educational charts	o	o	2		Ditto
10.18	Chart - Periodic Table and Atomic Data set	1	set	Biology/Agriculture				Ditto	o	o	1		Ditto
10.19	Charts - Human System Charts	1	each	Biology/Agriculture				Ditto	o	o	1		Ditto
11	Models / Biology												
11.1	Model - DNA Molecular Model Kit	1	unit	Biology				Teaching model	o	o	1		As basic teaching aids, one full set is planned.
11.2	Model - Organic Structure Model Set	1	unit	Biology				Ditto	o	o	1		Ditto
11.3	Model - Protein Synthesis	1	unit	Biology				Ditto	o	o	1		Ditto
11.4	Models - Plant & Animal cells, System, Organs	1	each	Biology				Ditto	o	o	1		Ditto
12	Models / Chemistry												
12.1	Molecular Models - Sodium chloride	1	unit	Chemistry				Molecular models	o	o	1		As basic teaching aids, one full set is planned.
12.2	Molecular Models - Diamond	1	unit	Chemistry				Ditto	o	o	1		Ditto
12.3	Molecular Models - Graphite	1	unit	Chemistry				Ditto	o	o	1		Ditto
12.4	Molecular Models - Scale Atoms kit	2	unit	Chemistry				Ditto	o	o	2		Ditto
13	General Equipment / Common Use												
13.1	TV Monitor	1	unit	Common use				To view educational programs	o	o	1		To use those AV equipment for common use, located in the AV lecture room or in the AV Section for rental.
13.2	VHS Video player	1	unit	Common use				Ditto	o	o	1		Ditto
13.3	Steel Cabinet for TV, VTR	1	unit	Common use				To store AV equipment.	o	o	1		Ditto
13.4	Slide Projector	1	unit	Common use				For slide presentation during lectures or	o	o	1		Ditto
13.5	Movable Projector Screen	1	unit	Common use				For presentation	o	o	1		Ditto
13.6	Desktop Computer	4	unit	Common use				To preparation of teaching materials/programs	o	o	4		To use the one in the computer labs.
13.7	UPS	4	unit	Common use				For protection of computer data	o	o	4		Ditto

Code	Description of Equipment	Qty	Unit	Course	Classification			Purpose of Use	Necessity	Sustainability	Evaluation	Planned Qty			Subject Investigated
					R	A	N					A	B	C	
13.8	AVR	1	unit	Common use	1		1	0	0	0	1			Ditto	
13.9	Digital Camera	1	unit	Common use	1		1	0	0	0	1			To use those AV equipment for common use, located in the AV lecture room or in the AV Section for rental.	
14	Glassware / Biology & Agriculture	1	lot	Common use				x	x	x	1			Eliminated: To be included in each equipment as accessories if	
15	Glassware & Other / Common Use	1	lot	Common use				x	x	x	1			Ditto	
16	Consumables for Tissue Culture / Biology	1	lot	Common use				x	x	x	1			No more required in lab works.	
17	Consumables / Common Use	1	lot	Common use				x	x	x	1			Eliminated: To be included in each equipment as accessories if	
<b>K Equipment for Other Lecture Theaters &amp; Classrooms</b>															
1	New Lecture Room (will be built in the Old Library)														
1.1	TV Monitor	1	unit	Common use			1	0	0	0	1			This room is planned as common facility for use by all classes. One set is planned to serve.	
1.2	VHS Video player	1	unit	Common use			1	0	0	0	1			Ditto	
1.3	CD/DVD Player	1	unit	Common use			1	0	0	0	1			Ditto	
1.4	Steel Cabinet for the above TV/VTR/CD/DVD player	1	unit	Common use			1	0	0	0	1			Ditto	
1.5	OHP	1	unit	Common use			1	0	0	0	1			Ditto	
1.6	Projector Screen	1	unit	Common use			1	0	0	0	1			Ditto	
1.7	Extension power reel	1	unit	Common use			1	0	0	0	1			Ditto	
1.8	Multimedia Projector	0	unit	Common use			0	0	0	0	1			This room is planned as common facility for use by all classes. The item requested as C-6 will be located in this room.	
1.9	Computer	0	unit	Common use			0	0	0	0	1			Ditto	
2	Old Lecture Theater														
2.1	Old Lecture Theater	1	unit	HEXA011 Expressive Arts I, etc.			1	0	0	0	1			To use those AV equipment, located in the AV Section for rental.	
2.2	VHS Video player	1	unit	HEXA011 Expressive Arts I, etc.			1	0	0	0	1			Ditto	
2.3	Steel Cabinet for the TV & VTR	1	unit	HEXA011 Expressive Arts I, etc.			1	0	0	0	1			Ditto	
2.4	Projector Screen, Movable	1	unit	HEXA011 Expressive Arts I, etc.			1	0	0	0	1			Ditto	
2.5	Extension power reel	2	unit	HEXA011 Expressive Arts I, etc.			2	0	0	0	2			Ditto	
2.6	Pin Spotlight, stand type	1	set	HEXA011 Expressive Arts I, etc.			1	0	0	0	3			Three portable type sets will be planned for common use with Multipurpose Theater. For pin spotlighting from 3 angles. Three portable type sets will be planned for common use with Multipurpose Theater. Three sets each are to be set in the right side and left side walls respectively.	
2.7	Stage Spotlight, Plano-convex	4	unit	HEXA011 Expressive Arts I, etc.			4	0	0	0	0			Multipurpose Theater. Five sets each are to be set in the right side and left side walls respectively.	
2.8	Stage Spotlight, Fresnel	9	unit	HEXA011 Expressive Arts I, etc.			9	0	0	0	10			Multipurpose Theater. Five sets each are to be set in the right side and left side walls respectively.	
2.9	Cable Terminal Box	1	set	HEXA011 Expressive Arts I, etc.			1	0	0	0	1			Multipurpose Theater. One portable type sets is planned for common use with Multipurpose Theater.	
2.10	Lighting Control Board	1	unit	HEXA011 Expressive Arts I, etc.			1	0	0	0	1			One portable type sets is planned for common use with Multipurpose Theater.	
2.11	Lamp for Spotlight	30	unit	HEXA011 Expressive Arts I, etc.			30	0	0	0	0			Ditto	
2.12	Audio System:	1	set	HEXA011 Expressive Arts I, etc.			1	0	0	0	1			To be included in each spotlights as accessories.	
2.121	Amplifier	1	unit	HEXA011 Expressive Arts I, etc.			1	0	0	0	1			To be included in above K-2.12.	
2.122	Mixer	1	unit	HEXA011 Expressive Arts I, etc.			1	0	0	0	1			Ditto	
2.123	Equalizer	1	unit	HEXA011 Expressive Arts I, etc.			1	0	0	0	1			Ditto	
2.124	Speaker system	1	set	HEXA011 Expressive Arts I, etc.			1	0	0	0	1			Ditto	
2.125	Tape Recorder/Player	1	unit	HEXA011 Expressive Arts I, etc.			1	0	0	0	1			Ditto	
2.126	CD/DVD Player	1	unit	HEXA011 Expressive Arts I, etc.			1	0	0	0	1			Ditto	
3	Classrooms in the Departments														
3.1	TV System	4	set	Common use			4	0	0	0	4			One set each for 4 departments are planned.	
3.11	TV Monitor	1	unit	Common use			1	0	0	0	1			To be included in above K-3.1.	
3.12	VHS Video player	1	unit	Common use			1	0	0	0	1			Ditto	
3.13	CD/DVD Player	1	unit	Common use			1	0	0	0	1			Ditto	
3.14	Steel Cabinet for the above TV/VTR/CD/DVD player	1	unit	Common use			1	0	0	0	1			Eliminated: Less frequent use.	
3.15	Extension power reel	1	unit	Common use			1	0	0	0	1			To be included in above K-3.1.	
3.2	Projector Screen, Movable	5	unit	Common use			5	0	0	0	5			Ditto	
3.3	White Board, Movable	5	unit	Common use			5	0	0	0	5			Eliminated: Not necessary.	
4	Life Skills Center														
4.1	Compact Stereo System (CD, Tape)	1	set	Common use			1	0	0	0	1			Eliminated: Less frequent use.	
4.2	TV Monitor	1	unit	Common use			1	0	0	0	1			One set is planned for the class.	
4.3	VHS Video player	1	unit	Common use			1	0	0	0	1			Ditto	
4.4	DVD Player	1	unit	Common use			1	0	0	0	1			Eliminated: Less frequent use.	
<b>L Equipment for Dept. of Ecology Section, Dept. of Ecology, Dept. of Ecology</b>															
1	METAL WORKSHOP														

Code	Description of Equipment	Qty	Unit	Course	Classification				Purpose of Use	Necessity				Subject Investigated	
					R	A	T	N		1	2	3	4		5
1.1	Metal Lathe	2	unit	SDTE331/431 Metal Practice	2				For practical of metal lathing					Basic workshop equipment. Two sets are planned to replace existing ones.	
1.2	Power Hack saw	4	unit	SDTE331/431 Metal Practice	1	3			For practical of metal cutting					Basic workshop equipment. Four sets are planned as replacement of and addition to the existing ones.	
1.3	Welder	2	unit	SDTE331/431 Metal Practice	1	1			For practical of welding					Basic workshop equipment. Two sets are planned as replacement of and addition to the existing ones.	
1.4	Spot Welder	1	unit	SDTE331/431 Metal Practice			1		Ditto.					Basic workshop equipment. One set is planned for common use of all students.	
1.5	Compressor	1	unit	SDTE331/431 Metal Practice				1	For painting of metal materials					Ditto	
1.6	Tube Bender	1	unit	SDTE331/431 Metal Practice				1	For bending tubes					Ditto	
1.7	Industrial Vacuum Cleaner	1	unit	SDTE331/431 Metal Practice				1	For cleaning workshop					One set is planned for cleaning the workshop.	
2	WOOD WORKSHOP														
2.1	Woodworking Lathe	2	unit	SDTE321/421 Wood Practice	2				For practical of wood lathing					Basic workshop equipment. Two sets are planned to replace existing ones.	
2.2	Dust Extractor	3	unit	SDTE321/421 Wood Practice	2	1			For sucking dusts					Three sets are planned for dust collection during practical.	
<b>M. Equipment for Home Economics Section, Dept. of Home Design &amp; Tech.</b>															
<b>CLOTHING LABORATORY</b>															
1.1	Electric Sewing Machine	10	unit	SHEC121 Introduction to Textiles & Design, etc.	6	4			For sewing practical					As basic equipment, 10 sets are planned as replacement of and addition to the existing ones.	
<b>FOOD LABORATORY</b>															
2.1	Refrigerator	1	unit	SHEC111 Introduction to Food & Nutrition, etc.	1				To store cooking materials					As basic equipment, 1 set is planned to replace existing one.	
2.2	Freezer	1	unit	SHEC111 Introduction to Food & Nutrition, etc.		1			Ditto					As basic equipment, 1 set is added to existing ones.	
2.3	Household Electric Stove	4	unit	SHEC111 Introduction to Food & Nutrition, etc.	3	1			To cook foods					As basic equipment, 4 sets are planned as replacement of and addition to the existing ones.	
2.4	Household Dishwasher	1	unit	SHEC111 Introduction to Food & Nutrition, etc.			1		To wash dishes					Eliminated. Not indispensable for teaching.	
2.5	Educational Video programs	1	set	SHEC111 Introduction to Food & Nutrition, etc.				1	Teaching Aids					As basic teaching aids, one set is planned.	
2.6	Desktop Computer	2	unit	Common use		1			To compile teaching materials					One set is planned for production and management of educational materials.	
2.7	UPS	2	unit	Common use				1	To protect computer data					Ditto	
2.8	Steam Presser	1	unit	SHEC121 Introduction to Textiles & Design, etc.				1	For pressing practical					One set is planned to teach basic clothing process.	
2.9	Overhead Projector	2	unit	Common use		2			For presentation					To use the equipment placed in the AV Section for common use	
<b>N. Equipment for Technical Vocational Section, Dept. of Econ. Design &amp; Tech.</b>															
<b>LATHE AND MILLING MACHINES</b>															
1.1.1	Measuring Instructions- Vernier Caliper	1	pc	STE/V225 Independent Workshop Project in TVE				1	To measure length of materials					As basic measuring instrument, 2 sets are planned.	
1.1.2	Measuring Instructions- Micro Meter 0.25mm	1	pc	STE/V225 Independent Workshop Project in TVE				1	Ditto					Ditto	
1.1.3	Measuring Instructions- Micro Meter 25-50mm	1	pc	STE/V225 Independent Workshop Project in TVE				1	Ditto					To be included in N-1.12.	
1.1.4	Measuring Instructions- Micro Meter 50-75mm	1	pc	STE/V225 Independent Workshop Project in TVE				1	Ditto					Ditto	
1.1.5	Measuring Instructions- Micro Meter 75-100 mm	1	pc	STE/V225 Independent Workshop Project in TVE				1	Ditto					Ditto	
1.2	Surface Gauge	1	unit	STE/V225 Independent Workshop Project in TVE				1	To measure surface smoothness of materials					As basic measuring instrument, 2 sets are planned.	
1.3	Vernier Height	1	unit	STE/V225 Independent Workshop Project in TVE				1	To measure height of materials					Ditto	
1.4	Dial Indicator gauge	1	pc	STE/V225 Independent Workshop Project in TVE				1	To measure thickness of materials					Ditto	
1.5	Marking out table	1	pc	STE/V225 Independent Workshop Project in TVE				1	For marking					As basic measuring instrument, 2 sets are planned together with tool boxes for storage.	
<b>PLUMBING TRADE</b>															
2.1	Blow lamp , medium	3	unit	STE/V225 Independent Workshop Project in TVE				3	To heat metal sheets					As basic plumbing tool, 3 sets are planned	
2.2	Pipe cutter, 3"	3	set	STE/V225 Independent Workshop Project in TVE				3	To cut pipes					Ditto	

Code	Description of Equipment	Qty	Unit	Course	Classification			Purpose of Use	Necessity			Sustainability			Subject Investigated
					R	A	N		Priority	Availability	Equivalency	Planned Qty	A	B	
2.3	Tube bender, copper/500 mm long	2	set	STEVE225 Independent Workshop Project in TVE			2	To bend pipes	o	o	o	2		As basic plumbing tool, 2 sets are planned.	
2.4	Tin snips (straight)	4	pc	STEVE225 Independent Workshop Project in TVE			4	To snip off (straight) metal sheets	o	o	o	4		As basic plumbing tool, 4 sets are planned.	
2.5	Rivet gun	3	pc	STEVE225 Independent Workshop Project in TVE			3	For riveting	o	o	o	3		As basic plumbing tool, 3 sets are planned.	
2.6	Silicon gun, 250mm long	3	pc	STEVE225 Independent Workshop Project in TVE			3	To fill gaps in joints, etc.	o	o	o	3		Ditto	
2.7	Tin snips (right hand) 150mm long	3	pc	STEVE225 Independent Workshop Project in TVE			3	To snip off (curving) metal sheets	o	o	o	4		As basic plumbing tool, 4 sets are planned.	
2.8	Electric Drill, 450 Amps	2	unit	STEVE225 Independent Workshop Project in TVE			2	To drill metal sheets	o	o	o		2	To use the one planned as N-3.12.	
2.9	Sillison, 150mm long	3	pc	STEVE225 Independent Workshop Project in TVE			3	To hold turn pipes	o	o	o	3		As basic plumbing tool, 3 sets are planned.	
2.10	Guliotire, Manual 90 Kg	2	unit	STEVE225 Independent Workshop Project in TVE	2			To cut off metal sheets, etc.	o	o	o	2		As basic plumbing tool, 2 sets are planned.	
2.11	Bender, Galvanize bender	2	unit	STEVE225 Independent Workshop Project in TVE			2	To bend metal sheets	o	o	o	2		Ditto	
2.12	Scriber (metal) 100mm long	3	pc	STEVE225 Independent Workshop Project in TVE			3	To scribe on metals	o	o	o	3		As basic plumbing tool, 3 sets are planned.	
2.13	Hacksaw, 300mm long	3	pc	STEVE225 Independent Workshop Project in TVE	2	1		To cut off metal sheets, pipes	o	o	o	3		Ditto	
2.14	Claw Hammer, 10 pound	5	pc	STEVE225 Independent Workshop Project in TVE			5	For nailing and nail pulling	o	o	o	8		As basic plumbing and metal plate working tool, 8 sets are planned.	
2.15	Plunger 4", 100mm	4	pc	STEVE225 Independent Workshop Project in TVE			4	To plunge pipes	o	o	o	5		As basic plumbing tool, 5 sets are planned.	
2.16	Flaring tool, 100mm	2	set	STEVE225 Independent Workshop Project in TVE		2		For flaring pipe ends	o	o	o	2		As basic plumbing tool, 2 sets are planned.	
2.17	Copper tube expander, silver	2	set	STEVE225 Independent Workshop Project in TVE		1		To exhaust the air of workshop	o	o	o	2		Ditto	
3	CARPENTRY TRADE														
3.1	Combination Square (adjustable)	4	pc	STEVE225 Independent Workshop Project in TVE			4	To measure length	o	o	o	4		As basic carpentry tool, minimum 4 sets are planned.	
3.2	Tape Measure set	4	pc	STEVE225 Independent Workshop Project in TVE			4	Ditto	o	o	o	4		Ditto	
3.3	Claw hammer set, 10 pound	4	pc	STEVE225 Independent Workshop Project in TVE			4	For nailing and nail pulling	o	o	o	4		Ditto	
3.4	Chisels set	4	unit	STEVE225 Independent Workshop Project in TVE			4	For chiseling woods	o	o	o	4		Ditto	
3.5	Screw Driver set	4	unit	STEVE225 Independent Workshop Project in TVE			4	To set wood screws	o	o	o	4		Ditto	
3.61	Handsaw, 26 inches- Crosscut Saw (set)	4	pc	STEVE225 Independent Workshop Project in TVE			4	For crosscutting	o	o	o	4		As basic carpentry tool, full combined sets of 4 are planned.	
3.62	Handsaw, 26 inches- Tenon saw	4	pc	STEVE225 Independent Workshop Project in TVE			4	For tenon	o	o	o	4		To be included in above N-3.61.	
3.63	Handsaw, 26 inches- Coping saw	2	pc	STEVE225 Independent Workshop Project in TVE			2	For coping	o	o	o	2		Ditto	
3.64	Handsaw, 26 inches- Hacksaw	4	pc	STEVE225 Independent Workshop Project in TVE			4	For hack sawing	o	o	o	4		Ditto	
3.71	Hand Planes, Medium- Smoothing plane	2	pc	STEVE225 Independent Workshop Project in TVE			2	For surface finishing of woods	o	o	o	2		As basic carpentry tool, minimum 2 sets are planned.	
3.72	Hand Planes, Medium- Jack plane	2	pc	STEVE225 Independent Workshop Project in TVE			2	For rough finishing	o	o	o	2		To be included in above N-3.71.	
3.73	Hand Planes, Medium- Block plane	2	pc	STEVE225 Independent Workshop Project in TVE			2	For planning edge of wood blocks	o	o	o	2		Ditto	
3.8	Ratchet screw drivers, 600mm long	3	pc	STEVE225 Independent Workshop Project in TVE			3	For driving and pulling wood screws	o	o	o	3		As basic carpentry tool, minimum 3 sets are planned.	
3.9	Screw driver bit set	2	pc	STEVE225 Independent Workshop Project in TVE			2	Bits for screw drivers	o	o	o	2		As basic carpentry tool, minimum 2 sets are planned.	

Code	Description of Equipment	Qty	Unit	Course	Classification			Purpose of Use	Necessity			Planned Qty			Subject Investigated
					R	A	N		Requirement	Availability	Stability	A	B	C	
3.10	Hand Brake Drill	4	pc	STEVE225 Independent Workshop Project in TVE			4	For drilling holes	o	o	o	4	4	As basic carpentry tool, minimum 4 sets are planned.	
3.11	Spiral Brace	5	pc	STEVE225 Independent Workshop Project in TVE			5	For driving brace	o	o	o	4	1	Ditto	
3.12	Power Drill (Portable)	1	unit	STEVE225 Independent Workshop Project in TVE	1			For drilling holes	o	o	o	3		Power drill will be commonly used among plumbing, carpentry and metal fabrication trades. Three sets are planned in consideration of existing equipment.	
3.13	Battery Operated Drill (Portable)	1	unit	STEVE225 Independent Workshop Project in TVE			1	Ditto	o	o	o	1		One set of battery operated type is planned for common use.	
3.14	Disc Grinder (Portable)	1	unit	STEVE225 Independent Workshop Project in TVE	1			For surface finishing (grinding)	o	o	o	2		Disc grinder will be commonly used among carpentry and metal fabrication trades. Two sets are planned.	
3.15	Electric Jig saw ( Portable)	1	unit	STEVE225 Independent Workshop Project in TVE	1			For free cutting of wood plates	o	o	o	1		As basic carpentry tool, 1 set is planned in consideration of frequency of use.	
3.161	Electric Sander - Vibrating Type	1	unit	STEVE225 Independent Workshop Project in TVE	1			For surface finishing (sanding)	o	o	o	1		Ditto	
3.162	Electric Sander - Belt Sander Type	1	unit	STEVE225 Independent Workshop Project in TVE	1			Ditto	o	o	o	1		Ditto	
3.17	Electric Portable Router	1	unit	STEVE225 Independent Workshop Project in TVE	1			For routing	o	o	o	1		Ditto	
3.18	Sliding Bevel	4	pc	STEVE225 Independent Workshop Project in TVE			4	For measuring angles	o	o	o	4		As basic carpentry tool, minimum 4 sets are planned.	
3.19	Marking knives	5	pc	STEVE225 Independent Workshop Project in TVE			5	For marking woods	o	o	o	4	1	Ditto	
3.20	Nail pincher	5	pc	STEVE225 Independent Workshop Project in TVE			5	For pulling nails	o	o	o	4	1	Ditto	
3.21	Extension drill bit set, 200mm long	4	pc	STEVE225 Independent Workshop Project in TVE			4	Bits set for drills	o	o	o	4		Ditto	
3.22	Triangular file	4	pc	STEVE225 Independent Workshop Project in TVE			4	For finishing surface	o	o	o	4		Ditto	
3.23	Saw set	3	pc	STEVE225 Independent Workshop Project in TVE			3	For cutting woods	o	o	o	4		Ditto	
3.24	Sledge hammer	2	pc	STEVE225 Independent Workshop Project in TVE			2	For fabricating	o	o	o	2		As basic carpentry tool, minimum 2 sets are planned.	
3.25	Dumpy level set	1	pc	STEVE225 Independent Workshop Project in TVE			1	For leveling	o	o	o	1		As basic carpentry tool, 1 set is planned for common use.	
3.26	Wrench Spanner, 200mm long	2	pc	STEVE225 Independent Workshop Project in TVE			2	To tighten bolts/nuts	o	o	o	2		As basic carpentry tool, minimum 2 sets are planned.	
3.27	Wrench Spanner, 150mm long	1	pc	STEVE225 Independent Workshop Project in TVE			1	Ditto	o	o	o	1		As basic carpentry tool, 1 set is planned for common use.	
3.28	Open end spanner set	1	pc	STEVE225 Independent Workshop Project in TVE			1	Ditto	o	o	o	1		Ditto	
3.29	Ring spanner set	2	pc	STEVE225 Independent Workshop Project in TVE			2	Ditto	o	o	o	2		As basic carpentry tool, minimum 2 sets are planned.	
3.30	Folding ruler	2	pc	STEVE225 Independent Workshop Project in TVE			2	To measure length	o	o	o	2		Ditto	
3.31	Fix square/try square, 200mm long	2	pc	STEVE225 Independent Workshop Project in TVE			2	Ditto	o	o	o	2		Ditto	
4	METAL FABRICATION & WELDING														
4.1	Transmill Welder	1	set	STEVE225 Independent Workshop Project in TVE	1			For welding	o	o	o	1		As basic welding tool, minimum 1 set is planned for common use.	
4.2	Easy/Portable welder	1	set	STEVE225 Independent Workshop Project in TVE	1			Ditto	o	o	o	1		Ditto	
4.3	Power Hacksaw Machine	1	set	STEVE225 Independent Workshop Project in TVE			1	To cut metal sheets	o	o	o	1		As basic metal fabricating tool, minimum 1 set is planned for common use.	
4.4	Metal Cutter	1	set	STEVE225 Independent Workshop Project in TVE			1	Ditto	o	o	o	1		Ditto	
4.5	Pipe Bender	1	set	STEVE225 Independent Workshop Project in TVE			1	To bend pipes	o	o	o	1		Ditto	
4.6	Electrode hot warmer	1	set	STEVE225 Independent Workshop Project in TVE			1	To dry welding electrode	o	o	o	1		Ditto	

Code	Description of Equipment	Qty	Unit	Course	Classification			Purpose of Use	Necessity	Suitability (Evaluation)			Planned Qty	Subject Investigated
					R	A	N			A	B	C		
4.7	Portable hand grinder	1	set	STEV225 Independent Workshop Project in TVE	1			To grind metal materials	o	o	o	1	To use N-3.14.	
4.8	Portable hand drill	1	set	STEV225 Independent Workshop Project in TVE	1			To drill holes	o	o	o	1	To use N-3.12.	
4.9	Steel rule	5	pc	STEV225 Independent Workshop Project in TVE			5	To measure length	o	o	o	5	As basic metal fabricating tool. 5 sets are planned.	
5	AUTOMOTIVE ELECTRICAL													
5.11	Multi Tester - Digital	2	pc	STEV225 Independent Workshop Project in TVE			2	To measure amperage, voltage, and resistance	o	o	o	2	As basic electrical tool, 2 sets are planned.	
5.12	Multi Tester - Analog	2	pc	STEV225 Independent Workshop Project in TVE			2	Ditto	o	o	o	2	Ditto	
5.21	Battery Charger- Booster	1	unit	STEV225 Independent Workshop Project in TVE			1	To charge batteries	o	o	o	1	As basic electrical tool, minimum 1 set is planned for common use.	
5.22	Battery Charger - Trickle	1	unit	STEV225 Independent Workshop Project in TVE			1	Ditto	o	o	o	1	Ditto	
5.3	Ammeter	1	pc	STEV225 Independent Workshop Project in TVE			1	To observe amperage	o	o	o	1	Ditto	
5.4	Voltmeter	1	pc	STEV225 Independent Workshop Project in TVE			1	To observe voltage	o	o	o	1	Ditto	
5.5	Capacitance Meter	1	pc	STEV225 Independent Workshop Project in TVE			1	To measure capacitance	o	o	o	1	Ditto	
5.61	Soldering iron - Small/Medium	1	unit	STEV225 Independent Workshop Project in TVE			1	For soldering	o	o	o	1	Ditto	
5.62	Soldering iron - Large	1	unit	STEV225 Independent Workshop Project in TVE			1	Ditto	o	o	o	1	Ditto	
5.7	Hydrometer	2	pc	STEV225 Independent Workshop Project in TVE			2	To measure specific gravity	o	o	o	2	As basic electrical tool, 2 sets are planned.	
5.8	Cadmium Tester	2	pc	STEV225 Independent Workshop Project in TVE			2	To measure luminance	o	o	o	2	Ditto	
5.9	Lug Crimpie	1	pc	STEV225 Independent Workshop Project in TVE			1	To place wire terminals	o	o	o	1	As basic electrical tool, minimum 1 set is planned for common use.	
5.10	Wire cutter	1	pc	STEV225 Independent Workshop Project in TVE			1	To cut wires	o	o	o	1	Ditto	
5.11	Electrical Tools	2	set	STEV225 Independent Workshop Project in TVE			2	Electric tool set	o	o	o	2	As basic electrical tool, 2 sets are planned.	
5.12	OHM Meter	2	pc	STEV225 Independent Workshop Project in TVE			2	To measure resistance of cables	o	o	o	2	Ditto	
5.13	Test Bench	1	unit	STEV225 Independent Workshop Project in TVE			1	Work table	o	o	o	1	As basic electrical tool, minimum 1 set is planned for common use.	
6	MOTOR MECHANIC													
6.1	Screw Driver set	1	set	STEV225 Independent Workshop Project in TVE			1	To set screws	o	o	o	1	As basic mechanic tool, minimum 1 set is planned for common use.	
6.2	Diagonal/side cutter plier	1	pc	STEV225 Independent Workshop Project in TVE			1	For cutting wires/cables	o	o	o	1	Ditto	
6.3	Combination Plier	1	pc	STEV225 Independent Workshop Project in TVE			1	Ditto	o	o	o	1	Ditto	
6.4	Long Nose/pointer	1	pc	STEV225 Independent Workshop Project in TVE			1	Ditto	o	o	o	1	Ditto	
6.5	Circulp plier (internal)	1	pc	STEV225 Independent Workshop Project in TVE			1	To place circlips	o	o	o	1	Ditto	
6.6	Circulp Plier (external)	1	pc	STEV225 Independent Workshop Project in TVE			1	Ditto	o	o	o	1	Ditto	
6.7	Vice Gripping plier	1	pc	STEV225 Independent Workshop Project in TVE			1	To fix parts	o	o	o	1	Ditto	
6.8	Torque Wrench - 1/2 inch Drive	1	pc	STEV225 Independent Workshop Project in TVE			1	To tighten bolts/nuts	o	o	o	1	Ditto	
6.9	Torque Wrench - 3/4 inch Drive	1	pc	STEV225 Independent Workshop Project in TVE			1	Ditto	o	o	o	1	Ditto	
6.10	Adjustable Wrench - 15 inch	1	pc	STEV225 Independent Workshop Project in TVE			1	Ditto	o	o	o	1	Ditto	



