

**CENTER FOR SECONDARY SPECIALIZED, VOCATIONAL EDUCATION
MINISTRY OF HIGHER AND SECONDARY SPECIALIZED EDUCATION
THE REPUBLIC OF UZBEKISTAN**

**BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR IMPROVEMENT OF TEACHERS'
RETRAINING IN THE SECONDARY SPECIALIZED
AND VOCATIONAL EDUCATION
IN
THE REPUBLIC OF UZBEKISTAN**

JULY 2003

**JAPAN INTERNATIONAL COOPERATION AGENCY
UNICO INTERNATIONAL CORPORATION**

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PREFACE

In response to a request from the Government of the Republic of Uzbekistan, the Government of Japan decided to conduct a basic design study on the Project for Improvement of Teachers' Retraining in the Secondary Specialized and Vocational Education and entrusted the study to the Japan International Cooperation Agency (JICA).

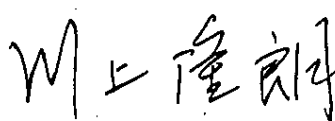
JICA sent to Uzbekistan study teams from November 26 to December 28, 2002, and from February 5 to March 6, 2003.

The teams held discussions with the officials concerned of the Government of Uzbekistan, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Uzbekistan in order to discuss a draft basic design, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Uzbekistan for their close cooperation extended to the teams.

July 2003



Takao Kawakami
President

Japan International Cooperation Agency

July 2003

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Improvement of Teachers' Retraining in the Secondary Specialized and Vocational Education in the Republic of Uzbekistan.

This study was conducted by UNICO International Corporation, under a contract to JICA, during the period from November 2002 to July 2003. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Uzbekistan and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

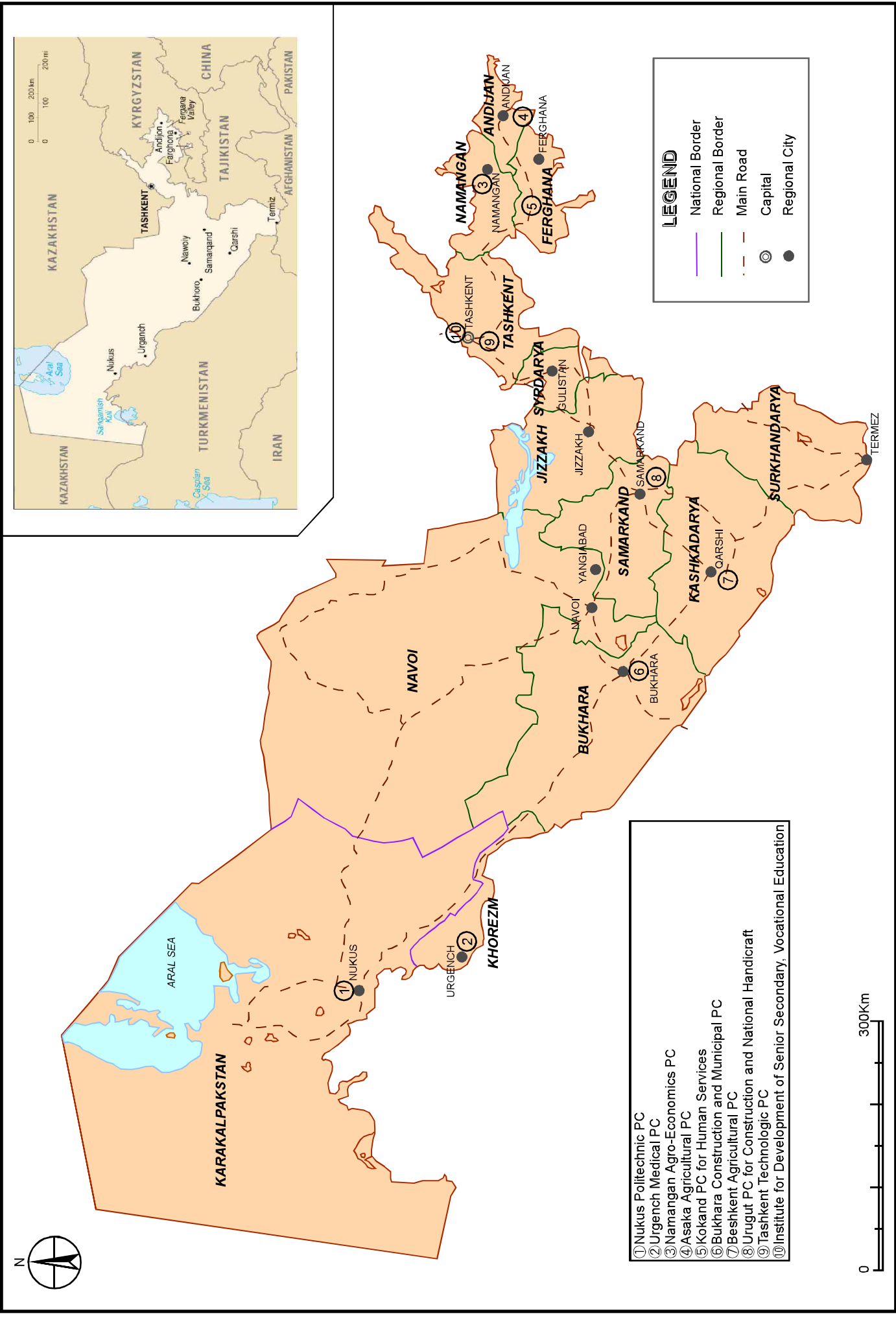
Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,



Wataru Shiga
Project manager,
Basic design study team on the Project
for Improvement of Teachers'
Retraining in the Secondary
Specialized and Vocational Education,
UNICO International Corporation

PROJECT SITE MAP



- ① Nukus Polytechnic PC
- ② Urgench Medical PC
- ③ Namangan Agro-Economics PC
- ④ Asaka Agricultural PC
- ⑤ Kokand PC for Human Services
- ⑥ Bukhara Construction and Municipal PC
- ⑦ Beshkent Agricultural PC
- ⑧ Urgut PC for Construction and National Handicraft
- ⑨ Tashkent Technologic PC
- ⑩ Institute for Development of Senior Secondary, Vocational Education

GLOSSARY OF TERMS AND ABBREVIATIONS

ADB	:	Asian Development Bank
AL	:	Academic Lyceum
A/P	:	Authorization to Pay
CIS	:	Commonwealth of the Independent States
CNC	:	Computer Numerical Controlled
CSSVE	:	Center for Secondary Specialized, Vocational Education
EBRD	:	European Bank for Reconstruction and Development
E/N	:	Exchange of Notes
EU	:	European Union
GDP	:	Gross Domestic Product
Hokimiyat	:	Regional, local administration
IBRD	:	International Bank for Reconstruction and Development
IDA	:	International Development Association
IDSSVE	:	Institute for Development of Secondary Specialized, Vocational Education
ISCED	:	International Standard for Classification of Education
JBIC	:	Japan Bank for International Cooperation
JICA	:	Japan International Cooperation Agency
J/V	:	Joint Venture
LAN	:	Local Area Network
MHSSE	:	Ministry of Higher and Secondary Specialized Education
NPPT	:	National Program for Personnel Training
OJT	:	On-the-job Training
PC	:	Professional College
TACIS	:	Technical Assistance for CIS
TEMPUS	:	Trans European cooperation scheme for higher education
TITLI	:	Tashkent Institute of Textile and Light Industry
UNDP	:	United Nations Development Program
UNICEF	:	United Nations International Children's Emergency Fund
UPS	:	Uninterruptible Power Supply

Summary

Uzbekistan is looked up as a nation possessing considerable potential for development, endowed with mineral (gold, copper) and energy (oil and gas) resources in addition to having an economy based largely on agricultural and particularly cultivation of cash crops such as cotton. Statistics bear this out; during the four years through 2001 the growth rate of the GDP exceeded 4% (according to the World Development Indicators, World Bank). The structure of industry, taken in terms of percent shares of GDP, shows a 27% share for agriculture, 15% for industry, 8% for construction, about 21% for services, and about 29% for others. The industrial sector is fourth in the world in cotton output, and third in silkworm production, in addition to being counted among the few gold producers of the world. Emphasis is being given to the processing of domestic raw materials such as these. In terms of production value, cotton accounts for the largest share of the textile industry, which in turn represents about 40% of total industrial output. The machinery industry, that is to a great extent characterized by production of equipment related to the processing of agro-products, has a share of about 10% and the energy sector share is somewhat more than 7%. The industrial sector thus is characterized by the importance of the processing of agricultural resources such as cotton and foods.

Uzbekistan is also endowed with a work force of relatively high quality. The national population, approx. 25 million, is the highest of the central Asian nations, and the literacy rate is about 99%. Of the employed population, about 40% is in the agricultural sector, 19% works in industry and construction, and about 23% is employed in services. Regarding the nation's human resources now being called upon to support the new industrial structure, the Uzbekistan government drafted the National Program for Personnel Training in 1997, whereby the secondary-level educational institutions that had lacked overall coherence would be reorganized, and whereby human resources such as are needed for the developing market economy can be prepared by the educational system. This has meant, among the changes, nothing less than fundamental reform of the educational system including compulsory education at the secondary level.

Because the program seeks to establish a new educational system that can adapt to the rapid change taking place in Uzbekistan society, improvements are being made in professional education subjects at all levels, starting with compulsory education grades, with emphasis being placed on imbuing the system with capability of producing human resources of immediate value in industry. In accordance with this, in addition to making progress in reforming the old professional schools at the secondary level, additional study of professional courses has been made a requirement at the new secondary-level educational institutions, the Professional Colleges ("PCs") and the Academic Lyceums ("ALs"). Educational reforms are now making progress in keeping with this policy framework.

Cabinet of Ministers Resolution 400, issued against this background on October 4, 2001, calls for

establishment of a system for secondary level education, with the long-term target of 2010. The Ministry of Higher and Secondary Specialized Education (MHSSE), on the basis of this order, has designated the Center for Secondary Specialized, Vocational Education (CSSVE) as the responsible body for school administration, human resources development, the educational program, and development of curricula, and as the core educational institutions has designated for improvement 178 AL and 1,689 PCs.

The present capabilities of instructors at the PCs and old-style vocational schools, both of which being charged with responsibility for developing skills in the work force, are not adequate for the task of imparting new technology to the students, making it difficult to bridge the gap between the technological levels in industry and the content of courses of instruction. Almost every piece of equipment for classroom or workshop education at the PCs and vocational schools, where international donors are yet to assist in supplying equipment, is a leftover from the Soviet era, and is out of date, and simply does not match the new textbooks, that are undergoing revision so as to reflect the ongoing technological development in the industrial sector. It has thus become urgent for develop a body of instructors who are familiar with the new technology, and new educational methods, within which it is of special importance to properly retrain the existing instructors.

In accordance with the reorganization of educational institutions on the basis of Cabinet of Ministers Resolution 400, the Institute for Development of Secondary Specialized, Vocational Education (IDSSVE) was founded in 1998 as an agency dedicated to raising the grade of instructors through retraining. They face the challenge of achieving the target given in Cabinet of Ministers Resolution of development of about 170,000 instructors by 2010. But a considerable period of time is needed to train a large body of instructors, and in order to enable the objectives of the ongoing reform of secondary-level education to be achieved it is strongly affirmed that it is of importance to raise the grade of existing instructors by retraining that equips them with familiarity of new pedagogical technology. IDSSVE is performing the functions of setting national educational standards (that reflect the demand for labor in the private industrial sector), deciding on certification of professional qualifications, and reformation of curricula; that is, it is engaged in a broad spectrum of activity.

The IDSSVE, however, is still a new organization and is not furnished with the equipment it needs to carry out its retraining program. In addition, there is a lack of printing machinery to produce the materials needed for retraining and as a consequence of these conditions both the creation of educational materials and preparation of curricula are lagging.

At the PCs, retraining is being done for instructors teaching specialized professional subjects; they are at 38 universities and at the PCs designated as pilot schools for their respective regions, and in all 2,000 subjects are covered, in 270 occupational categories. Because the PCs do not possess adequate educational

equipment for retraining instructors in specialized subjects, however, there cannot be a realistic review of professional education with an eye toward making it relevant to the application of new technology utilized in the course of transferring to a market economy, and consequently the IDSSVE cannot fully function as a center for retraining as provided for by the national program.

Because of these conditions, the CSSVE requested the Uzbekistan government to improve the educational equipment available for specialized courses for which instructor and trainer retraining must be done; and to improve the printing and related machinery available at the IDSSVE retraining department where educational materials in the Uzbek language are being prepared. The Uzbekistan government subsequently requested the government of Japan to provide grant aid assistance by providing educational equipment as needed.

In response to this request, the Government of Japan decided to conduct a basic design study and entrusted the study to examine the viability of the Project to the Japan International Cooperation Agency (JICA). JICA sent the study team to Uzbekistan and identified the background and contents of the Project as incorporated in this report.

This project has, within the broad perspective of Uzbekistan's transition to a market economy, the objective of improving the quality of vocational and professional education at secondary-level educational institutions in light of the forthcoming inclusion of secondary school within the scope of compulsory education. This is to be done by retraining of personnel employed in vocational education positions at the secondary school level, whereby technological innovation will be attained, and the qualifications of said personnel shall be improved. The ultimate objective of the project is to educate a large number of Uzbeks who will be of immediate value as workers in industry. Emphasis is to be given to replacement of old, outmoded equipment, and addition of new equipment deemed to be required, at the Institute for Development of Secondary Specialized, Vocational Education, which provides for the CSSVE retraining for core educational personnel managers and upgrading of certifications, and at nine professional colleges that have been selected as pilot schools.

It was confirmed that there were some projects in the relevant education sector extended by other donors. The ADB loan being intended for development of secondary-school professional education, it has as its objective 45 industrial, agricultural and commercial PCs. The JBIC loan, also being for development of secondary-school professional education, has as its objective 50 agricultural PCs. In both cases technical cooperation is provided in addition to improvement of equipment for student education in general as well as specialized courses. Korea's Economic Development Cooperation Fund (EDCF) has provided a loan for improvement of equipment for general-subject courses at more than 200 PCs. The equipment supplied by these projects does not duplicate this grant aid cooperation because it is limited to improvement of

equipment for specialized courses and for retraining of instructors.

Inquiries led to discovery that redundancy existed in that the Urgench Medical PC that is included in the planning and implementation of this project was also an object of assistance under the World Bank's "Health" project as well as the project for Improvement of Nursing Education System extended by the Government of Japan. Whereas in these projects the equipment to be supplied was primarily of the basic type for student use, there is no duplication in the siting and selection of the equipment since the it is basically that of the level of nurse retraining to be conducted in the affiliated educators' retraining center.

However, it was decided that the equipment requested for CSSVE, its regional centers, and the headquarter of IDSSVE, mainly consisting of computers and peripherals, were eliminated from the scope of this Project due to the reasons that these were not directly concerned with the educational activities in the retraining courses.

As a result of above examinations, the equipment to be provided by this Project can be classified in three broad categories, i.e., a) Equipment for vocational education (machine tools, shop tools, small-scale production equipment, agricultural machinery, laboratory equipment, training devices for practicing techniques, educational aids, etc.), b) Computers and network equipment, and c) Printing machinery. The total expenses necessary in the event that this project is realized through the grant aid program of the Japanese government is on the order of 715 million Japanese yen. Period for detailed design, and equipment procurement and installation work, etc. is estimated as about 4 months for the former, and about 10 months for the latter.

The following direct effects can be expected of implementing this project, which seeks to improve the equipment available for use in retraining instructors and trainers as part of the effort by the Uzbekistan government to attain objectives of national industrial policy, the National Human Resources Development Program's aspects relating to the educational sector, and Cabinet of Ministers Resolution 400's items concerning the development of educational staff for secondary-level schools, and meeting the retraining needs of those schools.

- * Retraining of educational staff for specialized courses at the PCs will enable participants in the retraining effort (about 700 persons/year) to learn teaching methods in which current technology is applied.
- * By making educational materials in-house (editing, printing, binding), the IDSSVE will be able to meet the nationwide demand for textbooks and educational materials in the Uzbek language, needed by the participants in IDSSVE retraining courses (about 1,800/year) in a timely manner.

- * By acquisition of state-of-the-art educational materials for the Information Technology courses the IDSSVE will make it possible for secondary-level schools (833 in all) throughout the nation where retrained staffs are assigned to make good use of information technology in their teaching.

This project therefore is in harmony with the national objectives regarding education and human resources development. Further, it will be possible for Uzbekistan to operate, maintain and manage the equipment to be procured under this project by employing its own personnel and its own funds. By means of practice production of goods, or cooperation with industry and other means, use of the equipment may earn a small amount of income, that can be used to offset maintenance costs, but the PCs selected for this project are primarily pilot schools, or models for the others. If, however, there is an improvement regarding the following points, implementation of the project would be that much smoother and more effective.

(1) Coordination with technical cooperation

The CSSVE directly and indirectly has indicated its desire to seek technical cooperation from Japan and other industrially advanced nations, for modernization of professional education. At the time of in-country work by the project team, CSSVE had not firmed up its intentions, but in the event that such practical technical cooperation is provided on a broad basis for the benefit of professional education in Uzbekistan, it would have a multiplier effect with regard to the present project, so that even greater effects could be anticipated.

(2) Strengthening interaction with the industrial sector

In the event that this project is implemented, equipment embodying new technology will be acquired by PCs. Further, the IDSSVE will acquire printing and related machinery. If the support of industrial concerns that are users of equipment similar to that acquired by the PCs can be obtained in connection with the operation and care of the new equipment the effectiveness of use of the equipment will be enhanced and it can be expected that the effects of this project would be greater.

(3) Relation with international agencies and other donor countries

Donor agencies other than Japan are carrying out aid projects for secondary-level education in Uzbekistan. These have the objective and involve curriculum development, training in pedagogical techniques using new technology, development of educational materials, and improvement of education equipment in order to bring professional education closer to the level matching operations in industry. It is anticipated that if this project is implemented it will have a synergistic relationship with these other efforts through the joint use of technical information relevant to the use, maintenance and management of the equipment.

TABLE OF CONTENTS

Preface

Letter of Transmittal

Location Map

Abbreviations

Summary

Chapter 1 Background of the Project	1-1
Chapter 2 Contents of the Project	2-1
2-1 Basic Concept of the Project	2-1
2-2 Basic Design of the Requested Japanese Assistance	2-1
2-2-1 Design Policy	2-1
2-2-2 Basic Plan (Equipment Plan)	2-10
2-2-3 Basic Design Drawing	2-95
2-2-4 Implementation Plan	2-117
2-2-4-1 Implementation Policy	2-117
2-2-4-2 Implementation Conditions	2-118
2-2-4-3 Scope of Works	2-118
2-2-4-4 Consultant Supervision	2-119
2-2-4-5 Procurement Plan	2-120
2-2-4-6 Implementation Schedule	2-122
2-3 Obligations of the Recipient Country	2-123
2-4 Project Operation Plan	2-132
2-5 Estimated Project Expenses	2-133
2-5-1 Project Expenses	2-133
2-5-2 Operating and Maintenance Costs	2-134
2-6 Other Relevant Issues	2-135
Chapter 3 Project Evaluation and Recommendations	3-1
3-1 Project Effect	3-1
3-2 Recommendations	3-2

[Appendices]

1. Member List of the Study Team	A1-1
2. Study Schedule	A2-1
3. List of Parties Concerned in the Recipient Country ..	A3-1
4. Minutes of Discussion (Basic Design Study 1)	A4-1
5. Minutes of Discussion (Basic Design Study 2)	A5-1
6. Minutes of Discussion (Consultation on Draft Report)	A6-1
7. Costs Estimation Borne by the Recipient Country	A7-1
8. References	A8-1

CHAPTER 1 Background of the Project

Chapter 1 Background of the Project

Since attaining independence in 1991, the Republic of Uzbekistan has followed a course of transition to a market economy that has been gradual in comparison to that of other Central Asian nations. While continuing to maintain relationships with the other Central Asian nations and the CIS countries, Uzbekistan has adopted a pro-active stance regarding attraction of direct investment from industrialized nations, and securing assistance in improvement of infrastructure and development of human resources from the various international agencies.

Endowed with mineral (gold, copper) and energy (oil and gas) resources in addition to having an economy based largely on agricultural and particularly cultivation of cash crops such as cotton, Uzbekistan is looked up as a nation possessing considerable potential for development. Statistics bear this out; during the four years through 2001 the growth rate of the GDP exceeded 4% (according to the World Development Indicators, World Bank). The structure of industry, taken in terms of percent shares of GDP, shows a 27% share for agriculture, 15% for industry, 8% for construction, about 21% for services, and about 29% for others. The industrial sector is fourth in the world in cotton output, and third in silkworm production, in addition to being counted among the few gold producers of the world. Emphasis is being given to the processing of domestic raw materials such as these. In terms of production value, cotton accounts for the largest share of the textile industry, which in turn represents about 40% of total industrial output. The machinery industry, that is to a great extent characterized by production of equipment related to the processing of agro-products, has a share of about 10% and the energy sector share is somewhat more than 7%. The industrial sector thus is characterized by the importance of the processing of agricultural resources such as cotton and foods.

During the Soviet era, the manufacturing sector engaged in production of aircraft, power generators, farm machinery, textile processing machinery, and other types of machinery made in large-scale factories. Although such production has been continued in the present era, it has fallen owing to the obsolete equipment and outdated technology that have been available to the former state owned companies. To counter this the government has sought to improve both the quality and value added of domestic industrial products, and improve domestic competitiveness vis-à-vis imports, and has promoted change in the structure of industry so that it can better contribute to improvement of the international balance of payments for goods through import substitution. This comprises the background against which the government, further, has endeavored to invigorate the industrial and agricultural sectors as they comprise the base of the economy, by promoting private enterprise, and on the basis of the policy of targeting achievement of a market economy and elevation of the national standard of living, has encouraged the rapid growth of foreign investment in all sectors of the economy, the acquisition of updated, current technology, and a switch in the nation's production facilities from the old former Soviet type to that of the industrialized nations.

Uzbekistan is also endowed with a work force of relatively high quality. The national population, approx. 25 million, is the highest of the central Asian nations, and the literacy rate is about 99%. Of the employed population, about 40% is in the agricultural sector, 19% works in industry and construction, and about 23% is employed in services. Regarding the nation's human resources now being called upon to support the new industrial structure, however, the present capabilities of instructors at the "Professional Colleges" (PCs) and old-style vocational schools, both of which being charged with responsibility for developing skills in the work force, are not adequate for the task of imparting new technology to the students, making it difficult to bridge the gap between the technological levels in industry and the content of courses of instruction. Almost every piece of equipment for classroom or workshop education at the professional colleges and vocational schools is a leftover from the Soviet era, and is out of date, and simply does not match the new textbooks, that are undergoing revision so as to reflect the ongoing technological development in the industrial sector. It has thus become urgent for develop a body of instructors who are familiar with the new technology, and new educational methods, within which it is of special importance to properly retrain the existing instructors.

Another change of the independent era is the ongoing conversion in textbooks, away from the use of Russian and its replacement by texts written in Uzbek, in accordance with a plan for conversion of 2,000 kinds of textbook by 2006. Preparation in Uzbek of materials for retraining of instructors is also proceeding, but one result has been to increase the demand for printing to a level at which printers have had to raise their prices and cannot satisfy all of the swiftly expanded demand.

The highest priority has been assigned to raising the levels of education and culture in general, and the improvement of both the content of educational courses and the quality of instructors. To do this, through tapping the latent intellectual potential of the people, the government has embarked on a course of establishing a new system for education. Compulsory education has been nine years (four of primary school, and five of first-stage secondary education), by means of which a literacy rate of 99% has been achieved. Up until the present time, almost all graduates from the general or professional (vocational) secondary-level school programs with the exception of the 10% or so who advanced to college went to work after leaving school. Following upon the departure, after the achieving of independence, of Russian technicians and engineers, it has become necessary to improve the educational system so that the shortage of skilled technical workers, particularly in the engineering and professional fields, could be remedied by providing young workers and students with the techniques and skills that will be directly usable at work. In the view of the Uzbekistan government, the major issues that the education sector confronts are:

- * Insufficient and inadequate technology and information in all of the educational curricula
- * A shortage of experienced instructors

- * A shortage of educational materials, and high-quality scientific materials and reference materials in particular
- * A discontinuity between the education, scientific, and industrial sectors

To deal with these problems, the Uzbekistan government drafted the National Program for Personnel Training in 1997, whereby the secondary-level educational institutions that had lacked overall coherence would be reorganized, and whereby human resources such as are needed for the developing market economy can be prepared by the educational system. This has meant, among the changes, nothing less than fundamental reform of the educational system including compulsory education at the secondary level.

The National Program comprises three phases, “Preparation for Reform” (1997-2001), “Carrying Out Reforms” (2001-2005), and “Follow-up and Improvement of Reform” (2005 onward). Because the program seeks to establish a new educational system that can adapt to the rapid change taking place in Uzbekistan society, improvements are being made in professional education subjects at all levels, starting with compulsory education grades, with emphasis being placed on imbuing the system with capability of producing human resources of immediate value in industry. In accordance with this, in addition to making progress in reforming the old professional schools at the secondary level, additional study of professional courses has been made a requirement at the new secondary-level educational institutions, the professional colleges and the “Academic Lyceums” (“ALs”). Educational reforms are now making progress in keeping with this policy framework. The present secondary-level institutions in Uzbekistan are shown in Table 1-1.

Table 1-1 Secondary Educational Institutions and Student Enrollment (2002-2003)

Regions	PCs		Teknikum		PTU		ALs		Total	
	No. of School	No. of Student	No. of School	No. of Student	No. of School	No. of Student	No. of School	No. of Student	No. of School	No. of Student
Karakalpakistan Republic	24	18,634	18	22,958	25	8,575	3	1,099	70	51,266
Andijan	48	36,542	8	6,053	15	4,951	3	1,238	74	48,784
Bukhara	22	13,640	8	5,000	11	5,400	2	1,050	43	25,090
Jizzakh	14	8,171	9	12,190	9	2,355	2	760	34	23,476
Kashkadarya	32	21,296	6	10,453	19	6,715	2	1,304	59	39,768
Navai	13	6,573	4	3,686	6	1,954	2	760	25	12,973
Namangan	43	31,762	4	4,145	11	4,481	2	1,382	60	41,770
Samarkand	36	18,342	13	22,151	25	6,994	2	1,141	76	48,628
Sirdarya	18	7,414	6	9,313	4	785	2	1,069	30	18,581
Surkhandarya	27	20,126	5	8,391	18	4,550	2	968	52	34,035
Tashkent	25	16,359	20	23,937	21	6,912	3	1,251	69	48,459
Fergana	36	21,054	13	12,549	23	7,261	3	1,467	75	42,331
Khorezm	29	21,242	6	7,150	22	6,172	1	288	58	34,852
Tashkent city	24	20,450	35	30,980	30	10,981	19	6,979	108	69,390
Total:	391	261,605	155	178,956	239	78,086	48	20,756	833	539,403

Source: CSSVE

Cabinet of Ministers Resolution 400, issued against this background on October 4, 2001, calls for establishment of a system for secondary level education, with the long-term target of 2010. The Ministry of

Higher and Secondary Specialized Education (MHSSE), on the basis of this order, has designated the Center for Secondary Specialized, Vocational Education (CSSVE) as the responsible body for school administration, human resources development, the educational program, and development of curricula, and as the core educational institutions has designated for improvement 178 academic lyceums and 1,689 professional colleges. It has been estimated that this requires, in turn, a total of 167,268 instructors at the secondary level (8,458 at academic lyceums and 158,810 at the professional colleges).

In accordance with the reorganization of educational institutions on the basis of Cabinet of Ministers Resolution 400, the need to rapidly develop a body of experienced instructors for the new educational program has become explicit, and the Institute for Development of Secondary Specialized, Vocational Education (IDSSVE), founded in 1998 as an agency dedicated to raising the grade of instructors through retraining, has established the CSSVE. They face the challenge of achieving the target given in Cabinet of Ministers Resolution of development of about 170,000 instructors by 2010. But a considerable period of time is needed to train a large body of instructors, and in order to enable the objectives of the ongoing reform of secondary-level education to be achieved it is strongly affirmed that it is of importance to raise the grade of existing instructors by retraining that equips them with familiarity of new pedagogical technology.

IDSSVE has the objectives of carrying out research activities that contribute to establishment of the new educational system including secondary level education, and implementing retraining of educators, instructors and administrators in the same area. Therefore this research center is performing the functions of setting national educational standards (that reflect the demand for labor in the private industrial sector), deciding on certification of professional qualifications, and reformation of curricula; that is, it is engaged in a broad spectrum of activity. The retraining plan of the IDSSVE, and accomplishments to date, are as shown in Table 1-2 on the following page. Educators who are the recipients of retraining are as shown in Table 1-3.

The IDSSVE, however, is still a new organization and is not furnished with the equipment it needs to carry out its retraining program. The equipment that was transferred to the IDSSVE when it was created is old and cannot be considered as fully having the functions required of it. In addition, there is a lack of printing machinery to produce the materials needed for retraining and as a consequence of these conditions both the creation of educational materials and preparation of curricula are lagging.

At the professional colleges, retraining is being done for instructors teaching specialized professional subjects; they are at 38 universities and at the professional colleges designated as pilot schools for their respective regions, and in all 2,000 subjects are covered, in 270 occupational categories. Retraining, now being done at the universities, is scheduled to be gradually transferred to the professional colleges. Because the professional colleges do not possess adequate educational equipment for retraining instructors in specialized subjects, however, there cannot be a realistic review of professional education with an eye toward

making it relevant to the application of new technology utilized in the course of transferring to a market economy, and consequently the IDSSVE cannot fully function as a center for retraining as provided for by the national program.

Because of these conditions, the CSSVE and the IDSSVE requested the Uzbekistan government to facilitate an improvement of the capability of carrying out retraining at PROFESSIONAL COLLEGES of educators and trainers in, and retraining at the IDSSVE of supervisory educators and educators in charge of information technology (“IT”); to improve the educational equipment available for specialized courses for which instructor and trainer retraining must be done; and to improve the printing and related machinery available at the IDSSVE retraining department where educational materials in the Uzbek language are being prepared. The request asked for expedient action in the case of high-priority educational materials. The Uzbekistan government subsequently requested the government of Japan to provide grant aid assistance by providing educational equipment as needed.

CHAPTER 2 Contents of the Project

Chapter 2 Contents of the Project

2-1. Basic Concept of the Project

This project has, within the broad perspective of Uzbekistan's transition to a market economy, the objective of improving the quality of vocational and professional education at secondary-level educational institutions in light of the forthcoming inclusion of secondary school within the scope of compulsory education. This is to be done by retraining of personnel employed in vocational education positions at the secondary school level, whereby technological innovation will be attained, and the qualifications of said personnel shall be improved. The ultimate objective of the project is to educate a large number of Uzbeks who will be of immediate value as workers in industry.

The method for achieving the objective is to implement a retraining program in and outside of Uzbekistan for secondary-level educational personnel, particularly those employed at Uzbekistan's Center for Senior Secondary, Vocational Education (CSSVE) and Professional Colleges (PCs), and by improving the equipment used at the relevant institutions.

By the target year 2010, the project's improvements are expected to result in capacity for retraining of 2,500 instructors a year, and in an improvement in capability of retraining the instructors.

Emphasis is to be given to replacement of old, outmoded equipment, and addition of new equipment deemed to be required, at the Institute for Development of Secondary Specialized, Vocational Education (IDSSVE), which provides for the CSSVE retraining for core educational personnel managers and upgrading of certifications, and at nine professional colleges that have been selected as pilot schools.

2-2 Basic Design of the Requested Japanese Assistance

2-2-1 Design Policy

(1) Basic Design

This project has been planned as one part of human resources development planning having the objective of facilitating development of the Uzbekistan economy as it advances in the direction of becoming a market economy. The Public Investment Program of Uzbekistan, on the basis of the three socio-economic objectives of (i) expanding exports, (ii) increasing employment opportunities, and (iii) accomplishing innovation of the

corporate sector and national finance, seeks to invigorate the nation's industrial base in industry and agriculture particularly by means of the vitality of private corporations, and to improve the national livelihood. Efforts to swiftly attract foreign capital into each of these economic sectors, and to acquire new technology, and a conversion from the old Soviet-type production equipment and materials to those based on technology in broad use in the industrially advanced nations, are being made in order to attain the foregoing goals.

Consequently, the development of the human resources necessary to support industry was identified as an intermediate objective, but the ability of the pedagogical staff at the professional colleges, that now have been included within the compulsory education program, is not sufficient for the new requirements, and a gap remains to be filled between the realities of applied or practical instruction and realities in industry. Further, almost all of the training- and education-use equipment and materials now available at the professional colleges and the vocational schools (Teknikums, PTUs) to be integrated with the professional colleges are of the old type, left over from Soviet era, a problem that has become that much more serious because these equipment and materials do not match the new textbooks that are now under preparation and are based on realities in industry.

In order to achieve a breakthrough in combating these problems, the Uzbekistan government, in addition to adopting the National Program for Personnel Training (NPPT), has set to making the necessary legal and regulatory changes as part of its plans for providing the youthful workers, who comprise the majority of the nation's population, with the technical abilities required of the industrial workforce.

In the secondary-level professional education system, and particularly the CSSVE, work is now being done to reduce and eliminate the inter-related problems of a shortage of schools, shortage of instructors, insufficiency in technical capabilities of instructors, shortage of educational materials, inadequacies of textbooks and pedagogical materials, as well as being done to revise pedagogical methods. At CSSVE, in addition to utilization of financial assistance from the ADB enabling the provision of educational materials and training of instructors for 45 professional colleges and academic lyceums, is planning to make improvements through use of financial assistance from the Japan Bank for International Cooperation (JBIC) for provision of educational materials and instructor training for 50 professional colleges specialized in agriculture, as measures for the improvement of the secondary-level professional education system.

Beyond this, however, in order to attain the national objective of operating 1,689 professional colleges and 178 academic lyceums by 2010, it is indispensable that besides providing for facilities and pedagogical materials it is necessary to substantially increase the number of trained and retrained instructors. This project has the objective of augmenting the materials needed for training and retraining of instructors in order to meet this need

at the secondary level of professional education.

Retraining of existing secondary-level instructors is being done in general accordance with the details set forth in Table 2-1. The CSSVE was established in 1998, with the purpose of its developing a new system of secondary-level professional education, and thus has responsibility for the preparation of new educational materials, construction of new facilities, improvement of pedagogical materials, and allocation and retraining of human resources. Under administrative control of the CSSVE is the IDSSVE, created in 2000 as an institution dedicated to improving the “soft” aspects of secondary-level education and training. The IDSSVE uses for its work eight categories of secondary-level education and training, namely agriculture; industry, telecommunications and transportation; business management; services; construction and public works; education and socio-economics; health care; and computers and information technology. In addition to its formulating plans for educating PC and university applicants at academic lyceums, and preparing the pedagogical materials for that, it undertakes retraining programs for existing educators.

TABLE 2-1 Retraining Course and Organizations

	Course	Organization		
		IDSSVE	University**	Professional College
1	Retraining of CSSVE Regional Centers' Staff			
1.1	Deputy Director (Public Issues)			
1.2	Deputy Director (Construction)			
1.3	Deputy Director (Training)			
1.4	Chief Expert			
2	Retraining of Teachers and Staff of PCs			
2.1	Director (Principal)			
2.2	Deputy Director (Public Issues)			
2.3	Deputy Director (Production Practice)			
2.4	Deputy Director (Practices)			
2.5	Chief Instructor			
2.6	Head of Personnel Department			
2.7	Education Methodologist			
2.8	IT Teacher			
2.9	Educator			
2.10	Practice Master			
3	Retraining of College Teachers in Specialized Subjects			
3.1	Teacher/Instructor*			

* 2,000 specialized subjects in 270 vocational categories

** Teachers of Retraining Faculty (University) help conducting retraining at IDSSVE and PCs

Retraining at CSSVE is done in five programs, namely information technology, professional education, educational psychology, economics and management; and the general subjects. The retraining is done primarily for senior staff of CSSVE, and managers, teachers and instructors at professional colleges. The CSSVE has held on a regular basis programs for improving knowledge of socio-economic affairs and legal or regulatory aspects relevant to changes following the start of the transition to a market economy, dissemination of knowledge about

the new systems and organization of vocational education pursuant to the educational reforms, and new teaching methods that utilize information technology. Because these are subjects common to any manager or educator regardless of specialty, they are given at the IDSSVE retraining facility in Tashkent, which has rooms for trainees to stay overnight. For instructors teaching vocational subjects at professional colleges, retraining for acquisition of new, current technology is provided at locations throughout the nation, for 2,000 subjects in 270 vocational categories, at 38 leading universities as well as professional colleges selected as pilot schools. In the case of university retraining faculties, training is provided within the framework of the existing subjects at the university and in the case of professional colleges, retraining sessions are held at the designated-subject pilot school, with cooperation by a leading university.

In view of the gradual transfer of retraining at universities to PC pilot schools, the present project, having the objective of improving the capacity and capability for retraining professional-subject instructors at the pilot professional colleges and retraining education managers at IDSSVE, will improve the educational equipment for education and training at these retraining facilities, and will augment the educational equipment used at IDSSVE for the entire process of production of educational materials needed for retraining, from the drafting of texts to printing. With regard to computer systems, for which a request for grant aid had been made, there are at present computers in use at CSSVE, its 14 regional centers, and the IDSSVE head office, and these can be put to use so as stated below computer systems are not included in the present project.

It was confirmed that there was some duplication in terms of sites selected and equipment planned for this project, relative to development projects by other donors. The ADB loan being intended for development of secondary-school professional education, it has as its objective 45 industrial, agricultural and commercial professional colleges, and the JBIC loan, also being for development of secondary-school professional education, has as its objective 50 agricultural professional colleges; in both cases technical cooperation is provided in addition to improvement of equipment for student education in general as well as specialized courses. Moreover, Korea's Economic Development Cooperation Fund (EDCF) has provided a loan for improvement of equipment for general-subject courses at more than 200 professional colleges. At the nine pilot professional colleges that are part of the objective of the present project, general-subject course equipment acquired through use of the EDCF loan has already been supplied but the present project does not duplicate this cooperation because it is limited to improvement of equipment for specialized courses and for retraining of instructors. We can affirm that the above donors' projects, providing equipment and technical cooperation, can be expected to provide a mutually supplementary function relative to and in support of the present project, from the viewpoints of maintenance and management of equipment and supply of technical information, two aspects in common to all projects.

Inquiries led to discovery that redundancy existed in that the Urgench Medical PC that is included in the planning and implementation of this project was also an object of assistance under the World Bank's "Health" project as well as the project for Improvement of Nursing Education System extended by the Government of Japan. A selection of educational equipment was made as the basis of a nursing curriculum in the World Bank project, when budgetary restraints excluded high-ticket items. Whereas in the World Bank project the equipment to be supplied was primarily of the basic type according to a "medical model," in the Japanese project the equipment selected was primarily basic and in accordance with a "nursing model" so that there was no duplication by the two projects and, rather, the two can be considered to be complementary. In both cases the projects sought to improve the educational equipment at the Urgench Medical PC. In the case of the present project, moreover, the objective being provision of educational equipment for the Urgench Medical PC's affiliated educators' retraining center to be opened in January 2004, there is no duplication in the siting of the equipment and moreover the equipment is basically that of the level of nurse retraining, so that it may be considered that there is no duplication of any project.

As is clear from the above, there is no duplication of project assistance by other donors, on the basis of site selection and course selection, at the nine pilot professional colleges. The following points were given consideration regarding equipment planning for professional subjects to be covered by implementation of this project. That is, by course, the JBIC project is to be for agriculture, veterinary medicine, zoo-technology, and operation and maintenance of agricultural equipment, while the ADB project is to be for educational equipment for these subjects. Regarding courses for metal works, welding technique, maintenance of gas supply equipment, and maintenance of electrical equipment, the ADB project supplies equipment for similar courses. Therefore the equipment requested for the present project included items similar or identical to those identified for the above projects. Nevertheless, because training related to how to provide instruction particularly through use of new technology, new equipment, and is to be of central importance in retraining professional-subject instructors at the nine pilot professional colleges of this project, the final selection of equipment to be included in the project was made on the basis of the intention of improving the educational training equipment believed to be necessary from the viewpoint of those providing education. Further, because part of the retraining will be done on-the-job through instruction of students, the retraining-use equipment includes some that is of the level used for student training. In this project, however, in giving consideration to requests from educators to take into account and anticipate the universality of technical knowledge, and future technological scalability, equipment planning was done so that the equipment would be of a suitable level for retraining of instructors.

The scope of cooperation by Japan for this project is as shown in Table 2-2 on the following page.

TABLE 2-2 Scope of Cooperation

No.	Organization	Training Course/Section	Retraining Target Regions	Regional Requirements	Reason for Selecting Course and Institution
1	Nukus Polytechnic Professional College	1) Metal works, 2) Welding	Karakalpakstan, Khorezm, Bukhara, Navoiy	In Karakalpakstan, mineral, oil and gas, and agricultural resources are abundant, and metalworking, textile processing, food processing and building materials industries are thriving.	This is the basic technique needed in all sorts of manufacturing concerns, and demand for labor in local industries is high.
2	Urgench Medical Professional College	1) Nursing, 2) Pharmacy	Karakalpakstan, Khorezm, Bukhara, Navoiy	The region is arid in the vicinity of the Aral Sea and there has been deterioration of the environment due to salt damage caused by irrigation. The occurrence of endemic disease is high.	Extremely high need for human resources in the health care field. The school is a traditional establishment in this region.
3	Namangan Agro-Economics Professional College	1) Veterinary, 2) Agronomy	Andijan, Fergana, Namangan, Tashkent Region	Namangan is rich in agricultural and mineral resources. Farm products include cotton, grapes, vegetables, fruit, silkworms; main livestock types are cows and goats.	Among the region's industry, agriculture is basic. Veterinary medicine is a traditional subject in the region. The school was established in 1934 and boasts a solid tradition.
4	Asaka Agricultural Professional College	1) O&M of agricultural machines and equipment	Andijan, Fergana, Namangan, Tashkent Region	Major industries in Andijan are manufacturing (machine processing, metalworking, chemicals, electric machinery, etc.), agriculture (cotton, grain, grapes, vegetables, others), as well as silkworm and livestock raising.	Machine repair is the students' most popular course, as employment opportunities are numerous.
5	Kokand Professional College of Human Services	1) Public catering, 2) Repair & service of radio engineering and tele-equipment	Andijan, Fergana, Namangan, Tashkent Region	The main industry in Fergana is agriculture but manufacturing (petroleum refining, fertilizer, textiles, silk, handmade textiles, fats and oils, building materials, ceramics, etc.) is also established.	Situated in the fertile Fergana Valley, the region's companies have high demand for workers. Public catering and telecommunications equipment repair is a small business field of importance; this is a field in which the number of independent entrepreneurs is increasing.
6	Bukhara Construction and Municipal Professional College	1) Installation & repair of equipment for gas supply system, 2) Installation of electric networks and equipment	Karakalpakstan, Khorezm, Bukhara, Navoiy, Samarkand, Kashkadarya, Suruhandarya	Bukhara is well endowed with mineral resources, oil and gas, and agricultural resources. It has in addition to the nation's largest refinery of petroleum large companies engaged in power supply and gas supply.	Growth in demand for construction of the public facilities in the region is expected, and demand for workers in the gas and electrical equipment fields is high. This is a traditional school of the region.
7	Beshkent Agricultural Professional College	1) Zootechnics, 2) Technology for preservation of agricultural products	Bukhara, Navoiy, Samarkand, Kashkadarya, Suruhandarya	Endowed with oil and gas resources, Kashkadarya also possesses light industry (textiles, wool), foodstuff industry (farm products processing), and building products industry. Agriculture is thriving; cotton is among the various crops. Livestock raising is practiced.	Efforts are being made to help the processed farm product sector, made up of small businesses and doing canning and bottling, education at this school is being shifted in emphasis to agriculture.
8	Urugut Professional College of Construction and National Handicraft	1) Joiner's carpentry and parquet works	Bukhara, Navoiy, Samarkand, Kashkadarya, Suruhandarya	Samarkand has a substantial building products industry (marble, granite, limestone) and the construction industry is doing well. There are many companies in the food processing, flour milling, machine processing, and chemicals business. It is a world-famous tourism area and traditional crafts are strong.	Traditional craft and accessory industries are thriving. Promoting the regional economy through development of crafts, particularly those making wood products, is important.
9	Tashkent Technologic Professional College	1) Food processing (bread, sweets, macaronis), 2) O&M of equipment for food production	Tashkent Region, Tashkent City, Sirdarya, Djizak	There are very many manufacturing companies located in Tashkent, the nation's largest industrial center. It is a modern city where the food preferences of the citizens are strongly West Europe oriented, and food processing companies are increasing.	Farm product processing a central industry here and there are many jobs in Tashkent which is the nation's largest center for food consumption.
10	Institute for Development of Secondary Specialized, Vocational Education (IDSVE)	Education methodology, information technology, printing technology, architecture & construction, quality control, etc.	All regions	The core organization for retraining instructors working in the country's middle-level education system, it was established by Cabinet decree (1998)	Lodging facilities for trainees have been completed and retraining study by instructors from throughout the nation is being carried out.

Note: Underlining of "Retraining Target Regions" indicates the city where the target institution is located.

The following was considered in addition to the nine pilot professional colleges as venues for retraining facilities for professional courses, and to the regional needs for the retraining subjects as shown in the table.

- * Specialization and level of each school
- * Past experience in retraining
- * Avoidance of duplication of assistance by other donors
- * Regional distribution and regional needs
- * Presence of staff for retraining (backstopping) at nearby higher education institutions.

Concerning vocational education items 1-9 from the retraining courses listed in the Table 2-2, vocational education equipment required for the specialized courses for the approved vocations and specialized techniques shown in Table 2-3 are to be provided. The persons to be trained for these specialized courses are to be, primarily, the instructors and teaching assistants responsible for the vocational training subjects. Further, regarding item 10 in the table, for IDSSVE, the object and subjects of retraining are to be as shown in the table, in addition to which the computers, network equipment and printers necessary for IDSSVE to function as coordinator of retraining are to be provided.

Selection of equipment for the retraining courses etc. for this project was done on the basis of the policy stated below.

a) High-priority equipment

- * Equipment compatible with the instructor retraining program and curriculum
- * Equipment to be frequently used in the practical training aspect of retraining
- * Equipment newly required for training
- * Equipment for which the number of pieces of the same equipment was not high enough for retraining needs
- * Equipment that Uzbekistan could not purchase by means of its own efforts

TABLE 2-3 Target Specialized Courses

No.	SSVE		Codes on ISEC**	Specialty	Codes on Specialties	Profession	Higher Education (bachelor degree)	
	Directions	Code					Direction	Code
1	Metal work	3520610	55442	Expert on in processing metals on turning, milling and drilling machine tools. The operator of machine tools with CNC. Punch man on cold punching	3520611, 3520612, 3520613	The master on metal working	Technology of mechanical engineering, equipment and automation machine-building manufacture	5520600
2	Welding technology	3522710	55442	The electric welder by automatic and semi-automatic machines. The electric welder of hand-operated welding. Gas-welding	3522711, 3522712, 3522713	The master on welding	Machines and technology of welding manufacture	5522700
3	Pharmacy	3720510	55052	The assistant of the pharmacist of drugstores. The agent on supply, storage and selling of medicinal means. The operators the servicemen and operators of machines on manufacturing medicinal means	3720511, 3720512, 3720513	The assistant of the pharmacist	Pharmacy	5720500
4	Nursing	3720610	55012	General practice nurse	3720611	Nurse at fair	Higher medical affair	5720600
5	Agronomy	B 620300	56208	Plant-grower. Fruit-vegetable grower. Biochemist-laboratory assistant. Driver of "B" and "C" category	-	Agriculturist	Agronomy	60010
6	Veterinary medicine	3640110	56232	The operator on veterinary processing of animal. Disinfectior. Lab-biochemist	3640111, 3640112, 3640113	The veterinary - medical assistant	Veterinary	5640100
7	Zootechnics*	3620610	56232	Animal-feeding operator. Live farming equipment repairman. Assimilator laboratory assistant	3620611, 3620612, 3620613	Zoo technician	Zootechny (by fields)	5620600
8	Operation and maintenance of agricultural machines and equipment	3541050	55452	The mechanic on repair of agricultural engineering. The tractor operator of a wide structure. Electro-gas welding. Driver of "B" and "C" category	3541051, 3541014, 3520123, 3520934	The master on operation and maintenance service of agricultural engineering	-	-
9	Public catering	3541220	55212	The cook. Confectioner. Baker	3541221, 3541222, 3541223	The younger technologist of public catering	-	-
10	Repair both service of radio engineering and tele-equipment	3810380	55422	The radio mechanics on repair of the radio electronic equipment. Radio tele-mechanics on service and repair of the radio television equipment	3810381, 3810382	The master on repair both service of a radio engineering and tele-equipment	-	-
11	Installation and repair the equipment of gas supply systems	3580430	56226	The assembler on the equipment of gas supply systems. The mechanic on repair of the equipment of gas supply systems. Electro-gas welding. Driver of "B" and "C" category	3580431, 3580432, 3520123, 3520934	The master on installation and repair of the equipment of gas supply systems	-	-
12	Installation of electrical networks and equipment	3520220	55416	The electro assembler on cable networks. The electro assembler on lighting networks. The electro assembler on power networks and electric equipment. The electro assembler on electrical machines	3520221, 3520222, 3520223, 3520224	The master on installation of electrical networks and equipment	-	-
13	Technology for preservation of agricultural products	3540710	56249	Boiler of food raw material. Operator of sterilization. Machinist of spill-filing automatic devices	3540711, 3540712, 3540713	Master on confectionery manufacture	Agro engineer	5540700
14	Joiner's carpentry and parquet works	3580260	55416	The joiner building. The carpenter. The glazier. Parquetry	3580261, 3580262, 3580263, 3580264	Master on carpentry and parquet works	-	-
15	Food processing (bread, sweets, macaroni)	3541170	55212	Operator on confectionery manufacture. Operator on baking manufacture. Operator on macaroni manufacture	3541171, 3541172, 3541173	Master on manufacture of baking, macaroni and confectionery products	-	-
16	Operation and repair of the equipment on manufacture of food production	3541210	55212	The operator on operation equipments of food production. The mechanic the repairman	3541211, 3541212	The master on operation and repair of the equipment on manufacture of food production	-	-

*Similar subject, for reference

**ISEC (International Standard for Educational Classification)

SOURCE: IDSSVE

b) Low-priority equipment

- * Equipment that would be used only by a limited number of instructors or students for education and practice; equipment of limited direct benefit
- * Equipment for departments having a supplementary role, not directly related to educator training.

c) Equipment outside project scope

- * Equipment requiring large scale facilities, increase or expansion of existing facilities, or repair of existing facilities
- * Software not for general applications (newly developed software, etc.)
- * Equipment to be supplied by other assistance entities
- * Equipment easily procurable within Uzbekistan using Uzbekistan budget allocations

(2) Design Policy

The level of the equipment of this project and specifications were determined on the basis of the following policy.

- 1) The equipment is to be of a level suitable for senior secondary professional education.
- 2) Equipment planning is to reflect present or future trends in Uzbekistan with regard to production equipment and technology, and industry-educational institution collaboration for production training.
- 3) The equipment design is to call for low levels of requisite technology, effort and expense for operation, maintenance, and management.
- 4) Specifications are fundamentally to comply with international standards, while the design is to conform to regulations and standards of Uzbekistan wherever applicable.
- 5) Replacement parts etc. are to be supplied in quantities suitable for normal equipment operation wherever applicable, and consumable supplies are to be provided in sufficient quantity for installation and test operation.
- 6) Technical staff members from the equipment manufacturers are to provide a satisfactory number of days of instruction on operation and maintenance following completion of installation.
- 7) A summarized manual for equipment operation in Uzbek or Russian languages will be supplied with some of the selected equipment.

(3) Policy for Implementing Assistance Activities

The equipment to be provided can be classified in three broad categories:

- a) Equipment for vocational education (machine tools, shop tools, small-scale production equipment, agricultural machinery, laboratory equipment, training devices for practicing techniques, educational aids, etc.)
- b) Computers and network equipment
- c) Printing machinery

The objectives of providing equipment under this project are, in accordance with the recipient government's policies for proceeding with the transition to a market economy, to replace the Soviet-style planning of education that had been in use prior to achieving independence with planning of education consistent with that of industrialized countries, to introduce into Uzbekistan education activities new technology and new equipment such as is becoming diffused in industry in general. The equipment selected for this project was so identified as one aspect of realizing those objectives, with the result that much of the equipment must be imported, while the equipment that is normally produced in Uzbekistan is limited to some of the agricultural implements etc. selected for the agriculture and agricultural equipment maintenance courses. If, further, computers etc. are excluded, there are not many pieces of equipment that are normally imported for sale in Uzbekistan. Therefore, in discussion with Uzbekistan officials it was agreed that the equipment to be provided will be fundamentally of Japanese origin and when a specific piece of equipment cannot be provided from Japan another country's supplier would be used.

The duration of time required for equipment delivery will be shortest in the case of computers (one month or two months) and longer for printing machinery, machine tools, and small-scale production equipment (about six months). In view of the overall schedule, equipment of such a grade as to require longer periods than these was excluded from consideration.

2-2-2 Basic Plan (Equipment Plan)

The Equipment Plan was drafted based on the outcome of discussions held in Uzbekistan regarding requested equipment. The results of inquiry and study regarding characteristics of the requests are as shown in Table 2-4 on the following pages.

Table 2-4 Equipment Study Work Sheet

No.	Sub No.	Designation of equipment	Req'd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
NU0000		1.Nukus Polytechnic Professional College										
NU1000		1.1 Metalworking										
NU1100		(Turnery Workshop)										
NU1101		Work bench with vise	2	Lathe work	Steps in lathe processing				2			One each for turning work preparation, and finishing
NU1102		Standard lathe	10	Lathe work	Practical training in basic lathe work				5			Plan is for one unit for every 2 persons, working in groups of 8 or 9, because this is one of the most basic items of equipment for hands-on training
NU1103		Chair	25	Lathe work	Use as needed upon request	x	x	x				Excluded as non-essential for training
NU1104		Vertical drilling machine	1	Lathe work	Drilling holes				1			One unit planned; owing to need to make somewhat large openings or holes
NU1105		Muffle furnace	1	Metallurgy	Heat treatment of parts				1			Plan one unit because of importance in heat treatment
NU1106		Bench drilling machine	1	Metalworking	Drilling narrow holes				1			Plan for one unit for use in making narrow-diameter notes with drill
NU1107		Turret lathe	5	Lathe work	Practical training in basic lathe work	x	x	x				Eliminated, as importance has been sharply cut by advent of CNC machines tools
NU1108		CNC lathe	4	Digital-control metalworking	Practice basic techniques of CNC machine tools					1		Plan only 1 unit because most work uses a model
NU1109		Bench grinder	1	Lathe work	General use in finishing work				1			One unit planned, for use in grinding & polishing parts
NU1110		Bench lathe	1	Lathe work	Practice basic turning technique					1		One unit planned, as this lathe is small and easy to use, making it suitable for training
NU1111		Tool set with tool box	13	Lathe work	Machinery maintenance, general work				9			Plan is for one set for every 2 persons, working in groups of 8 or 9, because this is one of the most basic items of equipment
NU1200		(Milling Workshop)										
NU1201		Bench with vise	2	Milling work	Milling work processes				2			2 are planned owing to need for that much work space
NU1202		Tool grinding machine, handy type	2	Metalworking	Sharpening of tools				1			One unit planned, owing to necessity in maintenance of tools
NU1203		Universal milling machine	8	Drilling work	Practice basic techniques of milling				1			Important, but would be lone unit planned
NU1204		CNC milling machine	2	Digital-control metalworking	Practice basic techniques of CNC machine tools				1			Only one unit planned as most study would be done using models
NU1205		Bench drilling machine	1	Metalworking	Making small holes using a drill				1			Drilling is needed for a variety of processes; this workshop will have one unit
NU1206		Lifting-rotary chair (for vertical drilling machine)	1	Metalworking	Processing work	x	x	x				Eliminated owing to very low level of use
NU1207		Vertical machining center	4	Digital-control metalworking	Practical training using machine tools	x	x	x				Eliminated owing to difficulty of operation & maintenance
NU1208	1	Vertical boring machine	1	Metalworking	Making large-diameter openings using cutter mounted on main shaft	x	x	x				Eliminated as operation & maintenance would be too difficult
NU1208	2	Vertical milling machine	0	Milling work	Practice basic techniques of milling				5			The most typical milling machine; plan is for 8-9 persons per group, plan is for one unit or more for every two persons
NU1209		Horizontal milling machine	1	Milling work	Practice basic techniques of milling				1			An important milling machine; one unit planned
NU1210		Surface grinder	2	Milling work	Surface finishing of parts	x	x	x				Eliminated owing to low level of usage
NU1211		Grinding machine, cylindrical type	0	Milling work	Polishing, smoothing cylindrical parts				1			One unit planned owing to necessity of polishing in finishing stage
NU1212		Tool set with tool box kit	13	Milling work	Machinery maintenance, general work				9			Basic machine; one set planned for each person in 8-9 person group
NU1213		Chair, lifting rotary	25	Milling work	Use as needed upon request	x	x	x				Eliminated as unnecessary
NU1300		(Metal Workshop)										
NU1301		Bench with vise	1	Metalworking	Use in practical training in metalwork basics				1			One unit planned, for instructor use

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
NU1302		Bench with vise	25	Metalworking	Use in practical training in metalwork basics				9		16	9 units planned for each person in 9-person groups
NU1303		Chair for lifting rotary	25	Metalworking	Ditto	x	x	x			25	Eliminated as unnecessary
NU1304		Bench drilling machine	1	Metalworking	Making small holes with a drill				1			Small-bore holes must be made in all processes of work; one unit of this necessary machine planned
NU1305		Vertical drilling machine	1	Metalworking	Making holes with a drill				1			One unit planned owing to need to drill holes in all kinds of processing
NU1306		Shearing machine	1	Metalworking	Used to cut steel sheets				1			One unit planned of this machine, needed as the most basic machine for cutting steel sheet.
NU1307		Bench grinder	1	Metalworking	General finishing work				2			Plan one unit as usage would be high in all processes
NU1308		High speed cut-off machine	1	Metalworking	Cutting metal by use of a high-speed rotating disc				1			Needed to cut metal other than steel sheets; one unit planned
NU1309		Bandsaw	1	Metalworking	Cutting metal				1			One planned – valuable equipment for cutting thick metal sheets
NU1310		Pipe bending machine	1	Metalworking	Bending pipe without changing x-sectional dimension				1			One planned – essential for bending pipe
NU1311		Press brake	1	Metalworking	Bending sheet metal between upper & lower parts of a press				1			This equipment is essential for bending steel sheets * 2 units planned
NU2000		1.2 Welding										
NU2001		Standard block for hardness testing	1	Welding	Measuring change in hardness of metal caused by heat treatment/welding				1			One unit planned, as it is important to check on effect welding has on hardness of metal
NU2002		Rockwell hardness tester	1	Welding	Ditto				1			Ditto
NU2003		Grimmell hardness tester	0	Welding	Ditto				1			Ditto
NU2004		Magnetic defect detector	1	Welding	Inspection of welds				1			One unit planned; this is essential for verifying results of welding work
NU2005		Ultrasonic defect detector	1	Welding	Ditto					1		Frequency of use is not high but this is indispensable for learning new technology; one unit planned
NU2006		Are welding apparatus	4	Welding	Use in practical training in arc welding				6			Important item; each person of a 6-person group to have a unit to work with
NU2007		TIG welding apparatus	2	Welding, automatic & semi-auto.	Use in practical training in TIG arc welding	x	x	x			2	Eliminated; argon gas is costly and maintenance of it is difficult
NU2008		MIG welding apparatus	2	Welding, automatic & semi-auto.	Use in practical training in MIG welding	x	x	x			2	Ditto
NU2009		Spot welding apparatus, portable	2	Resistance welding	Use in practical training in spot welding				1		1	One each, portable and treadle, to be supplied
NU2010		Spot welding apparatus, fixed type	0	Resistance welding	Ditto				1		1	Ditto
NU2011		Gas welding unit	6	Gas welding	Use in practical training in basic welding technique			x			6	This item is deleted as each component of the set is provided for elsewhere. Under NU2012-2022 is provision for a gas welding set
NU2012		Acetylene gas generator	1	Gas welding	Use in practical training in acetylene welding				1			This is a basic item; one to be provided.
NU2013		Oxygen cylinders	1	Gas welding	Ditto				6			Important for welding study/practice; one unit for each group of 6 to be supplied
NU2014		LPG & butane cylinders	1	Gas welding	Ditto				6			Ditto
NU2015		Welding torch & cutting torch in set	1	Gas welding	Ditto				6			Ditto
NU2016		Gas hose (for oxygen, acetylene, LPG or butane)	1	Gas welding	Ditto				6			Ditto
NU2017		Acetylene gas reducer	2	Gas welding	Ditto				6			Ditto
NU2018		Oxygen flow regulator	2	Gas welding	Ditto				6			Ditto
NU2019		LPG/butane gas flow regulator	2	Gas welding	Ditto				6			Ditto
NU2020		Torch lighter	2	Gas welding	Ditto				6			Ditto

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
NU2021		Hose clamp	2	Gas welding	Ditto				24			Ditto
NU2022		Handtruck for cylinders	2	Gas welding	Ditto				2			Necessary for moving cylinders; two to be provided
NU2023		Welding rod drier	2	Welding techniques	Dry storage of welding rods				1			1 Plan calls for 1 of suitably large size
NU2024		Welding rod container	1	Welding techniques	Storage of welding rods	x	x	x				1 Eliminated, as flux is not needed for submerged arc welding
NU2025		Flux container	1	Welding techniques	Container for flux for submerge arc welding	x	x	x				1 Eliminated – low level of use; low value for on-hands training
NU2026		Brazing materials kit	1	Welding techniques	Basic training in brazing techniques				6			Usage would be high; plan is for each member of a 6-person group to have use of a unit
NU2027		Soldering materials	1	Welding techniques	Basic training in soldering techniques				6			One per person in 6-person group is planned, as experience is required to use these techniques
NU2028		Plastic welding kit (hard vinyl chloride, polyethylene)	1	Welding techniques	Basic training in plastic bonding techniques	x	x	x				1 Eliminated as not essential to curriculum
NU2029		Fire extinguisher	1	Welding techniques	Safety measures	x	x	x				1 Eliminated as not needed for learning
NU2030		D C arc welding apparatus	2	Welding techniques	Basic training in arc welding				1			1 Plan on one unit as actual use would be limited
NU2031		CO2 arc welding apparatus	4	Welding, automatic & semi-auto.	Basic training in CO2 arc welding				6			1 Plan on each person in a 6-person group to have the apparatus, as this is important aspect of welding
NU2032		Plastic bonding kit with accessory	1	Welding techniques	Basic training in fusing plastics	x	x	x				1 Eliminated as not essential to curriculum
NU2033		CO2 cylinder heater	1	Welding, automatic & semi-auto.	Prevention of valve freezing caused by liquid CO2				6			1 Plan 6, equal to no. of CO2 cylinders
NU2034		A C / DC arc welding	1	Welding techniques	Basic training in welding techniques	x	x	x				1 Low level of usage, low need in training; eliminated
NU2035		Submerge arc welding	1	Welding, automatic & semi-auto.	Practical training in submerge arc welding	x	x	x				1 Ditto
NU2036		Electrode wire	1	Welding, automatic & semi-auto.	Basic training in welding techniques				1			1 Plan to supply suitable quantity of consumables for test operation
NU2037		Tungsten electrode	1	Welding, automatic & semi-auto.	Ditto				1			1 Plan to supply suitable quantity of consumables for test operation. To be included in NU2036.
NU2038		Welding rod for carbon steel	2	Welding techniques	Ditto				1			1 Ditto
NU2039		Welding rod for alloys	2	Welding techniques	Ditto				1			1 Ditto
NU2040		Welding rod for casting iron	1	Welding techniques	Ditto				1			1 Ditto
NU2041		Welding rod for cast steel	2	Welding techniques	Ditto				1			1 Ditto
NU2042		Welding rod for stainless steel	2	Welding techniques	Ditto				1			1 Ditto
NU2043		TIG welding rod for aluminum	2	Welding, automatic & semi-auto	Basic training in TIG welding	x	x	x				2 Eliminated due to elimination of TIG equipment
NU2044		MIG welding wire (1.0-1.6φ)	3	Welding, automatic & semi-auto	Basic training in MIG welding techniques	x	x	x				3 Ditto
NU2045		Flux	3	Welding, automatic & semi-auto	Basic training in submerge arc welding	x	x	x				3 Ditto
NU2046		Other welding rods	1	Welding techniques	Basic training in welding techniques				1			1 Plan to supply suitable qty of consumables for test operation
NU2047		Brazing materials set	2	Welding techniques	Basic training in brazing techniques				1			1 Ditto
NU2048		Powder welding wire	3	Welding techniques	Basic training in brazing techniques	x	x	x				3 Redundant; eliminated
NU2049		Soldering materials set	1	Welding techniques	Ditto				1			1 Plan to supply suitable qty of consumables for test operation
UJH0000		2. Urgench Medical Professional College										
UJH1000		2.1 Pharmacy / Nursing										
UJH1100		(Trainer)										

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
UHI 101		Trainer for first aid	1	Treating accident victims	Practice in artificial respiration & heart massage				1			High value; emergency care has been given high priority in Uzbekistan recently
UHI 102		Trainer for emergency treatment	1	Treating accident victims	Practice in stopping blood loss, treating broken bones, burns, etc. on emergency basis	x	x	x				Emergency medical care is so broad in scope that only one trainer cannot cover everything; for basic study UHI 101 is to be used
UHI 103		Trainer for catheterization (male)	1	Therapy & nursing 1.2	Trainer for catheterization & bed bath (male)				1			Used in training of nurses in most fundamental aspects of urology
UHI 104		Trainer for catheterization (female)	1	Therapy & nursing 1.2	Trainer for catheterization & bed bath (female)				1			Ditto
UHI 105		Trainer for vagina investigation	1	Obstetrics, Gynecology & Nursing	Training in examination of the vagina & neck of the womb		x	x	1			Eliminated as this is for physicians' use
UHI 200		(Solid and relief models)										
UHI 201		Head, sagittal section	1	Basics of anatomy, physiology, pathology	Understanding of the structure of the human body for study of basics of anatomy, physiology, and pathology				1			One unit planned, as this is a basic model showing the structure of the human body
UHI 202		Brain, arrangement	1	Basics of anatomy, physiology, pathology	Ditto				1			Ditto
UHI 203		Needles for conducting spinal taps	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				Eliminated; not urgent; request withdrawn
UHI 204		Diamond-shaped hole, projection of nucleus of cranial nerves and head	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				Ditto
UHI 205		Spinal cord and nerves	1	Basics of anatomy, physiology, pathology	Ditto				1			One unit planned, as this is a basic model showing the structure of the human body
UHI 206		Structure of eye	1	Basics of anatomy, physiology, pathology	Ditto				1			Ditto
UHI 207		Structure of ear	1	Basics of anatomy, physiology, pathology	Ditto				1			Ditto
UHI 208		Digestive system	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				Eliminated; not necessary; request withdrawn
UHI 209		Stomach interior, exterior surfaces	1	Basics of anatomy, physiology, pathology	Ditto				1			One unit planned, as this is a basic model showing the structure of the human body
UHI 210		Heart	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				Eliminated; not necessary; request withdrawn
UHI 211		Kidney	1	Basics of anatomy, physiology, pathology	Ditto				1			One unit planned, as this is a basic model showing the structure of the human body
UHI 212		Urinary system	1	Basics of anatomy, physiology, pathology	Ditto				1			One unit planned, as this is a basic model showing the structure of the human body
UHI 213		Defects of development of urethra system	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				Eliminated; not urgent; request withdrawn
UHI 214		Embryo genesis of urethra system	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				Ditto
UHI 215		Evolution of urino-genital system	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				Ditto
UHI 216		Liver	1	Basics of anatomy, physiology, pathology	Ditto				1			One unit planned, as this is a basic model showing the structure of the human body
UHI 217		Liver tissues	1	Basics of anatomy, physiology, pathology	Ditto				1			Ditto
UHI 218		Inside surface of the small and large intestine	1	Basics of anatomy, physiology, pathology	Ditto				1			Ditto

No.	Sub No.	Designation of equipment	Requ'd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
UHI 219		Intestine hair with vascular channel	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x	1			1 Eliminated; not urgent; request withdrawn
UHI 220		Organs in torso	1	Basics of anatomy, physiology, pathology	Ditto				1			One unit planned, as this is a basic model showing the structure of the human body
UHI 221		Male sexual organs	1	Basics of anatomy, physiology, pathology	Ditto				1			Ditto
UHI 222		Female sexual organs	1	Basics of anatomy, physiology, pathology	Ditto				1			Ditto
UHI 223		Head and neck muscles	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Eliminated; not urgent; request withdrawn
UHI 224		Trunk muscles	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 225		Arm muscles	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 226		Leg muscles	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 227		Skin section	1	Basics of anatomy, physiology, pathology	Ditto				1			One unit planned, as this is a basic model showing the structure of the human body
UHI 228		Lymphatic system	1	Basics of anatomy, physiology, pathology	Ditto				1			Ditto
UHI 229		Nerves of vertebrae	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Eliminated; not urgent; request withdrawn
UHI 230		Embryo genesis of face	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 231		Topography of "acupuncture"	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 232		Topography of "acupuncture" of ear	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 300		(Electrified models)										
UHI 301		Universal trainer	1	Nursing	Every item for nursing training (20 items)				1			Educational effects would be high as this trainer covers the basics of nursing comprehensively
UHI 302		Digestive system	1	Basics of anatomy, physiology, pathology	Understanding of the structure of the human body for learning basics of anatomy, physiology and pathology	x	x	x				1 Not an urgent necessity; eliminate after request was withdrawn
UHI 303		Heart	1	Basics of anatomy, physiology, pathology	Ditto				1			One unit planned, as this is a basic model showing the structure of the human body
UHI 304		Muscles of head, neck	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Eliminated; not urgent; request withdrawn
UHI 305		Trunk muscles	1	Basics of anatomy, physiology, pathology	Ditto				1			One unit planned, as this is a basic model showing the structure of the human body
UHI 306		Arm muscles	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Eliminated; not urgent; request withdrawn
UHI 307		Leg muscles	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 400		(Skeleton, plastic)										
UHI 401		Human skeleton (male & female)	1	Basics of anatomy, physiology, pathology	Understanding of the structure of the human body for learning basics of anatomy, physiology and pathology				1			One unit planned, as this is a basic model showing the structure of the human body

No.	Sub No.	Designation of equipment	Requd Qty	Name of Course	Purpose of use	Neces- sity	Suitab- ility	Evalu- ation	Planned Qty			Subject investigated
									A	B	C	
UHI 402		Skull	1	Basics of anatomy, physiology, pathology	Ditto				1			Ditto
UHI 403		Skull foundation	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Eliminated; not urgent; request withdrawn
UHI 404		Skull mounted on set	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 405		Temporal bone	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 406		Frontal bone	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 407		Parietal bone	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 408		Occipital bone	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 409		Backbone	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 410		Upper jaw	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 411		Lower jaw	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 412		Wedge-shaped bone	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 413		Ethmoid bone	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 414		Acoustic bones	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 421		Skeleton of hand	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 422		Skeleton of arms	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 423		Shinbone	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 424		Fibula	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 425		Skeleton of foot, with tendons	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 426		Skeleton of legs	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 427		Spinal column	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 428		Vertebrae (7)	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UHI 500		(Anatomical models)										
UHI 501		Bronchial tubes	1	Basics of anatomy, physiology, pathology	Understanding of the structure of the human body for learning basics of anatomy, physiology and pathology				1			One unit planned, as this is a basic model showing the structure of the human body
UHI 502		Mimic and masticator muscles	1	Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Eliminated; not urgent; request withdrawn

No.	Sub No.	Designation of equipment	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
								A	B	C	
UH1 503		Funny bone & muscles	1 Basics of anatomy, physiology, pathology	Ditto				1			One unit planned, as this is a basic model showing the structure of the human body
UH1 504		Hand with adjoining muscles & nerves	1 Basics of anatomy, physiology, pathology	Ditto				1			Ditto
UH1 505		Types of lower jaw fracture	1 Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Eliminated; not urgent; request withdrawn
UH1 506		Eye ball	1 Basics of anatomy, physiology, pathology	Ditto	x	x	x				1 Ditto
UH1 507		Trunk	1 Basics of anatomy, physiology, pathology	Ditto				1			One unit planned, as this is a basic model showing the structure of the human body
UH1 600		(Nursing equipment)									
UH1 601		Supersonic wave radiator	1 Therapy & nursing 1,2	Use for treatment of windpipe, bronchial tube disorders				1			Highly necessary as this equipment is widely used in Uzbekistan for therapeutic care
UH1 602		Hemoglobin- meter	2 Clinical & biological exam methods	Measurement of blood hemoglobin				2			Blood work is a basic subject and the equipment would be used very often
UH1 603		Needles for spinal tap	2 Clinical & biological exam methods	Use not known	x	x	x				2 Eliminated; not urgent; request withdrawn
UH1 604		Calorimeter (photoelectric)	1 Clinical & biological exam methods	Measurement of heat content of fluids, samples, etc.				1			Such measurements are needed quite frequently in bio-related work
UH1 605		Incubator	1 Obstetrics, gynecology & nursing	System for premature baby care				1			Care or premature infants is an important subject for gynecology, and it is important for training to feature the latest techniques
UH1 606		Stretcher	1 Therapy & nursing 1,2	Practice use of stretcher					1		Using a stretcher is a basic skill required of nurses
UH1 607		Ultraviolet radiator	2 Therapy & nursing 1,2	Learn method of use				2			A basic item for clinics
UH1 608		Sterilization case	4 Therapy & nursing 1,2	Learn method of use				4			Ditto
UH1 609		Universal trainer	1 Therapy & nursing 1,2	Simulation training for therapy	x	x	x				1 Eliminated as redundant
UH1 610		Trainer for muscular injection, venous injection	5 Therapy & nursing 1,2	Practice in phlebotomy, IV injections, subcutaneous injections				5			Nurses must collect blood samples and give injections frequently, as routine tasks, and are required to master this work
UH1 611		Electro distiller	1 Clinical & biological exam methods	System for distilling water				1			Distilled water is a basic resource used in medical work. One unit will suffice for the entire school
UH2000		(Additional equipment)									
UH2100		(Trainers)									
UH2101		Cardiology patient simulator	0 Diagnostic technique for respiratory, cardiac, vascular disorder diagnosis								1 Eliminated; this is equipment for physicians
UH2102		Multipurpose in-patient trainer	0 Therapy & nursing 1,2	Simulation training for therapy	x	x	x				1 Eliminated as redundant
UH2103		Suture practice trainer	0 Therapy & nursing 1,2	Simulation training for therapy							1 Eliminated as this is used by physicians
UH2104		Wearable breast examination model	0 Obstetrics, gynecology & nursing	Practice in digital examination of breasts							1 Ditto
UH2105		Newborn bathing and nursery care trainer	0 Obstetrics, gynecology & nursing	Practice in bathing & caring for newborn infants				1			Total reliability is essential for nurses when they provide care for newly born babies
UH2106		Emergency first aid Airway suction trainer	0 Treating accident victims	Training in facilitating breathing				1			First-aid treatment in frequent demand & requiring advanced techniques
UH2107		Newborn vital signs demonstrator	0 Obstetrics, gynecology & nursing	Generates signals for heartbeat, respiration, pulse and temperature of having a heartbeat				1			Equipment is for training in fundamental aspects of infant care
UH2108		Childbirth trainer	0 Obstetrics, gynecology & nursing	Model of pregnant woman with fetus having a heartbeat				1			Nurses doing gynecological work frequently must listen for fetal heartbeat
UH2109		Eye examination trainer	0 Therapy & nursing 1,2	Simulator enabling simulated eye examinations by use of graphic data	x	x	x				1 Eliminated; this is equipment for physicians

No.	Sub No.	Designation of equipment	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
								A	B	C	
UH2110		Blood collection and injection trainer	0 Therapy & nursing 1,2	Practice in giving injections & taking	x	x	x	1			Eliminated; redundant
UH2200		2.2 Pharmacology									
UH2201		Assaying balance	0 All courses	Weighing of materials, medications				3			Basic equipment; 3 units planned on basis of appropriate efficiency of use assuming classes are split into 3_group
UH2202		Water bath	0 All courses	Device for maintaining temperature of water in a vesse				4			Basic equipment; 4 units planned on basis of appropriate efficiency of use assuming classes are split into 4_group
UH2203		Electrical centrifuge	0 All courses	Equipment for separation of components of blood etc.				4			Ditto
UH2204		Automatic water distiller	0 All courses	System for distilling water			x				4 Distilled water is a basic resource but provision is made for this in UH11611 and this line item is eliminated
UH2205		Thermometer, range -10 to +110 deg	0 All courses	Measure body temperature				32			This is a basic measurement device; breakdowns are frequent so 7 spares are included in the total plan of 32.
UH2206		Porcelain mortar & pestle 30ml	0 All courses	Grind and mix solid medications	x		x				32 Basic equipment; used by all. 1 set is included in UH221
UH2207		Porcelain mortar & pestle 50ml	0 All courses	Grind and mix solid medications			x				32 Ditto
UH2208		Porcelain mortar & pestle 75ml	0 All courses	Grind and mix solid medications			x				32 Ditto
UH2209		Porcelain mortar & pestle 110ml	0 All courses	Grind and mix solid medications			x				32 Ditto
UH2210		Porcelain pestle	0 All courses	Grind and mix solid medications			x				32 Ditto
UH2211		Organic chemistry experiment set	0 All courses	General-purpose experiments in organic chemistry					32		Needed for each person. Damage is frequent so 7 spares for total of 32 are planned
UH2212		Magnetic stirring device without heating	0 All courses	Uses magnetism to perform stirring				10			A basic tool that is frequently used; assuming 2 or 3 persons will share one, 10 are planned
UH2213		Electronic balance	0 All courses	Determine specific gravity of materials & medications				4			This is a basic measurement device; 4 are planned as 6 persons can use a unit at the same time
UH2214		pH meter and millivoltmeter	0 All courses	Measure pH of materials				4			Ditto
UH2215		Pressure, volume, temperature measurement apparatus	0 All courses	Measure pressure, volume, temperature				4			Ditto
UH2216		Chemical test apparatus	0 All courses	Set of equipment for chemical analysis work				4			Ditto
UH2217		Biological microscope	0 All courses	Study of biological samples				4			Ditto
UH2218		Table-top autoclave	0 All courses	Heating of samples etc.				1			A basic tool for experimentation
NA0000											
NA1000											
NA1001		Autoclave	1 Animal dissection, surgery	Sterilization of laboratory instruments				1			Basic machine; one unit planned
NA1002		Electric massage apparatus	1 Animal husbandry veterinary surgery	Stress reduction; health maintenance				1			Ditto
NA1003		Blood cell counter	1 Pathology, infectious disease	Blood cell counts				1			Ditto
NA1004		Analytical Chemical balance	1 Pathology, pharmacology	High-precision weighing of various materials				1			Ditto
NA1005		Binocular microscope	4 Parasitology	Examination for small parasites			x				5 Need for this is high but NA1021 can be used so it is eliminated
NA1006		Examination instrument set	3 Parasitology	Examination for presence of liver fluke, a parasite				5			Plan is for one unit for every 2-3 persons, in groups of 13, because need to use this equipment will be high
NA1007		Large-animal dissection kit	1 Animal dissection	Dissection of animals				1			Basic machine; one unit planned
NA1008		Vaginal mirror for female animals	5 Veterinary obstetrics, veterinary pathology	Inserted in vagina to permit visual inspection				5			Plan is for one unit for every 2-3 persons, in groups of 13, because need to use this equipment will be high
NA1009		Endoscopes	1 Veterinary pathology, pharmacology	Observations & biopsies in stomach & large intestine of animal				1			Basic machine; one unit planned

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
NAI 1010		Animal thermometer	10	Veterinary obstetrics, veterinary pathology	Body temperature measurement				13			Plan is for one unit for every person, working in groups of 13 because frequency of use would be high
NAI 1011		Histological preparation set	1	Veterinary pathology, veterinary physiology	Observation under the microscope of tissues from various sites in animals				1			Basic machine; one unit planned
NAI 1012		Drug shooting pistol for animals	1	Pathology, infectious diseases, pharmacology	Easy administration of medications to animals				1			Basic machine; one unit planned
NAI 1013		Sphygmomanometer for animals	5	Pathology, infectious disease	Measure animal blood pressure				5			Plan is for one unit for every 2 persons, working in groups of 13, because need to use this equipment will be high
NAI 1014		Tool set for measuring animal size	1	Animal husbandry	Evaluate size of cow				1			Basic machine; one unit planned
NAI 1015		Percussion hammer with pleximeter	2	Pathology, infectious disease	Diagnosis of disease				2			Two units planned; somewhat high extent of use expected
NAI 1016		Injection syringes	2	Pathology, infectious disease	Giving injections to animals				5			Plan is for one unit for every 2-3 persons, working in groups of 13 because need to use this equipment is high
NAI 1017		Urinary tract catheter in set	1	Pathology, infectious disease	Insert in urinary tract to facilitate urine				1			Basic machine; one unit planned
NAI 1018		Milking catheter in set	1	Pathology	Treating mastitis				1			Ditto
NAI 1019		Cage for laboratory animals	2	Pathology, infectious disease	Contain animals in a cage				2			Two units planned owing to frequency of use
NAI 1020		Magnetic probe	1	Animal husbandry	Prevent injury to stomach by pointed objects				1			Basic machine; one unit planned
NAI 1021		Biological microscope for students	13	Pathology, infectious disease	Observation of bacteria and tissues of various sites in animal bodies				13			Plan is for one unit for every person, working in groups of 13, because frequency of use of this equipment will be high
NAI 1022		Veterinary obstetrics tool kit	1	Veterinary obstetrics	Use at time of animal births				1			Basic machine; one unit planned
NAI 1023		Forceps for cutting hoofs	1	Animal husbandry	Trimming of hoofs				1			Basic machine; one unit planned
NAI 1024		Hoof examination instrument	1	Animal husbandry	Inspection of hoofs				1			Ditto
NAI 1025		Surgical tool kit, for large animals	1	Veterinary surgery	Instruments for performing surgery on large animals				1			Basic machine; one unit planned
NAI 1026		Nasopharynx (nose/throat probe)	1	Pathology, infectious disease	Rubber tube for examination of nasal passages, throat				1			Basic machine; one unit planned
NAI 1027		Esophagus probe	1	Pathology, infectious disease	Extraction of foreign matter lodged in esophagus				1			Ditto
NAI 1028		Metal detector	1	Animal husbandry	Determine location in body of metal				1			Ditto
NAI 1029		Device for testing /assessing milk	1	Animal husbandry	Measure specific gravity of milk				1			Ditto
NAI 1030		Device for taking blood	1	Pathology, infectious disease	Taking blood samples from animals				1			Ditto
NAI 1031		Device for inhalation	1	Pathology, infectious disease	For administering small particles of medication into lungs				1			Ditto
NAI 1032		Device to detect mastitis by testing	1	Pathology	Early detection of mastitis				1			Ditto
NAI 1033		Trichinosis detector	1	Parasitology	Detection of trichinosis by microscopy				1			Ditto
NAI 1034		Portable sprayer	1	Pathology, infectious disease	For spreading disinfectant				1			Ditto
NAI 1035		Surgery table, large animals	1	Animal dissection	Dissection of large animals				1			Ditto
NAI 1036		Electronic balance	1	Animal husbandry	Weighing				1			Ditto
NAI 1037		Alcohol meter	5	Pharmacology	Measurement of specific gravity of alcohol used for medication				5			Plan is for one unit for every 2-3 persons, in groups of 13, because need to use this equipment will be high
NAI 1038		Universal bench for fixing animals	1	Animal husbandry,	To restrain an animal in a frame				1			Basic machine; one unit planned
NAI 1039		Stetho-phonendoscope	13	Pathology, infectious disease	For diagnosis of disease				2			Level of use would be low but since a degree of proficiency is called for plan is for 2 units per 13-person group
NAI 1040		Instrument table	1	Animal surgery	For array of surgical instruments				1			Basic machine; one unit planned
NAI 1041		Instrument shelf	1	Animal surgery, pathology,	For storage of various instruments				1			Ditto
NAI 1042		Large animal surgery table	1	Animal surgery	Used in large-animal surgery				1			Ditto

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
NA1043		Small animal surgery table	1	Animal surgery	Used in small-animal surgery				1			Ditto
NA1044		Water heater	1	Animal surgery	For making hot water for cleansing etc.				1			Ditto
NA1045		Trocator	4	Animal surgery	Remove foreign bodies from an animal				5			Plan is for one unit for every 2-3 persons, in groups of 13, because need to use this equipment will be high
NA1046		Refrigerator	1	Pharmacology, pathology, bacteriology	Low-temperature storage of medications, materials etc				1			Basic machine; one unit planned
NA1047		Centrifuge	1	Pharmacology, pathology, bacteriology	Necessary for separation of various material;				1			Basic machine; one unit planned
NA1048		Syringe-injectors in set	5	Pathology, infectious disease	Giving injections to animals				5			Plan is for one unit for every 2-3 persons, in groups of 13, because need to use this equipment will be high
NA1049		Electro cardio- graph	1	Pathology	Taking ECGs of animals				1			Basic machine; one unit planned
NA1050		Freezer	1	Pharmacology, pathology, animal husbandry	Preservation of various chemicals and other materials by freezing				1			Ditto
NA1051		Electric oven with time switch	1	Pharmacology, animal husbandry	Used for heating, drying, evaporating various substances				1			Ditto
NA1052		Cow model for insemination	1	Animal husbandry	Use in practicing artificial insemination of cow				1			Ditto
NA1053		Model of cow skeleton	1	Animal husbandry, animal anatomy	Study of the skeletal makeup of the cow				1			Ditto
NA1054		Model of cow internal organs, muscular system	1	Animal husbandry, animal anatomy	Study of internal organs and muscular structure of the cow				1			Ditto
NA2000		3.2 Agronomy										
NA2001		Soil sieve	1	Crop cultivation, breeding	Separation of soil particles according to diameter range				1			Basic machine; one unit planned
NA2002		Electronic balance	1	Crop cultivation, breeding	Weighing				1			Ditto
NA2003		Analytical balance	1	Crop cultivation, breeding	Weighing				1			Ditto
NA2004		Pot-soil heating apparatus	1	Crop cultivation	Control of pot soil temperature to study influence of temperature on plant growth & development				6			Plan is for one unit for every 2-3 persons, working in groups of 13 because this is an important, basic piece of equipment
NA2005		Desiccators	1	Crop cultivation, breeding	Desiccation of various materials				6			Ditto
NA2006		Cool incubator	1	Crop cultivation, breeding	Storage of various samples or research materials, and tissue culture, at a stable temperature				1			Basic machine; one unit planned
NA2007		Soil compaction testing apparatus	1	Crop cultivation	Compaction of soil to desired values for study purposes				1			Ditto
NA2008		Soil auger	1	Crop cultivation	Taking soil samples from sub-surface layers for analytic purpose				1			Ditto
NA2009		Soil color chart	1	Crop cultivation	Classify soils by coloration				1			Ditto
NA2010		Biological microscope	1	Crop cultivation, breeding	Observation of tissue sections, cells, etc				6			Plan is for one unit for every 2-3 persons, working in groups of 13 because this is a very basic piece of equipment
NA2011		Titration device for chemical analysis of fruits and vegetables	1	Agro chemistry	Quantifying acidity of fruits & vegetables				1			Basic machine; one unit planned
NA2012		Sulphate test strips	1	Agro chemistry	Testing for presence of sulphates in fertilizer etc.				1			Basic machine; one unit planned
NA2013		pH meter	1	Agro chemistry	Measure pH of aqueous solutions				1			Ditto
NA2014		Hydroponics complete analysis kit	1	Agro chemistry	Quantitative analysis of fertilizer components and trace elements in hydroponic solution				1			Ditto
NA2015		Salinity meter	1	Agro chemistry	Measure salinity of aqueous solutions				1			Ditto

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
NA2016		Soil moisture meter with soil moisture blocks	1	Crop cultivation	Measure moisture content of soil				1			Ditto
NA2017		Current flow meter	1	Crop cultivation	Insert the meter in running water to ascertain the flow rate				1			Ditto
NA2018		Soil thermometer	2	Crop cultivation	Measure soil temperature				6			Plan is for one unit for every 2-3 persons, working in groups of 13 because this is a basic piece of equipment
NA2019		Spectrophotometer	1	Agro chemistry	Used for qualitative & quantitative analysis of solution.				1			Basic machine; one unit planned
NA2020		Chromatography	1	Agro chemistry	Detection of amino acids, organic chemicals, sugars, etc				1			Ditto
NA2021		Colorimeter	1	Agro chemistry	Used for rudimentary qualitative & quantitative analysis of solution				1			Ditto
NA2022		Penetrometer	1	Crop cultivation	Measurement of hardness of soil from surface to lower layers				1			Ditto
AS0000												
AS1000												
AS1001												
AS1002												
AS1003												
AS1004												
AS1005												
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AS1019												
AS1020												
AS1021												
AS1022												

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
AS1023		Potato digger	1	Farm machinery	Wide-blade equipment specifically for digging potatoes:				1			Ditto
AS1024		Rotary mower	1	Farm machinery	Rotating blades cut grass and collect it				1			Ditto
AS1025		Standard lathe	1	Metal technology, machinery maintenance	A work piece is attached to the main shaft and processed				1			One unit planned for sake of maintenance & servicing of farm machines
AS1026		Bench drilling machine	1	Metal technology, machinery maintenance	Making narrow-diameter holes using a metal drill				1			Ditto
AS1027		Are welder	1	Metal technology, machinery maintenance	Perform arc welding				1			Ditto
AS1028		Spot welder	1	Metal technology, machinery maintenance	Perform spot welding				1			Ditto
AS1029		Balancing machine	1	Tractors & motor vehicles	Balance tires of a motor vehicle				1			Ditto
AS1030		Gas welding equipment, complete	1	Metal technology, machinery maintenance	Perform gas welding				1			Ditto
AS1031		Torque wrench	1	Machinery maintenance	Tightening bolts & nuts with precise application of torque				2			Two planned, owing to strong demand
AS1032		Distillation apparatus	1	Machinery maintenance	Distillation of battery water				1			One unit planned for sake of maintenance & servicing of farm
AS1033		Hydraulic stacker truck	1	Machinery maintenance	Lifting heavy machinery for repair work				1			Ditto
AS1034		Soldering set	1	Metal technology, machinery maintenance	Perform soldering				1			Ditto
AS1035		Tool set	1	Machinery maintenance	General tool set	×	×	×				1 Eliminated, redundant
AS1036		Hydraulic jack	1	Metal technology, machinery maintenance	For maintenance & repair of machines				1			One unit planned for sake of maintenance & servicing of farm machines
AS1037		Diesel engine compression meter	1	Machinery maintenance	Monitoring performance of compression in cylinders of diesel				1			Ditto
AS1038		Air compressor	2	Machinery maintenance	Supply compressed air for pneumatic tools & inflation of tires:				1			1 Ditto
AS1039		Tool set	1	Machinery maintenance	Maintenance & repair of machines	×	×	×				1 Eliminated as redundant
AS1040		Oil pump	1	Machinery maintenance	Maintenance & repair of machines				1			Basic machine; one unit planned
AS1041		Oil bucket pump	1	Machinery maintenance	Maintenance & repair of machines				1			Ditto
AS1042		Riveter	1	Machinery maintenance	Maintenance & repair of machines				1			Ditto
AS1043		Battery charger	1	Machinery maintenance	Maintenance & repair of machines				1			Ditto
AS1044		Tire changer	1	Machinery maintenance	Maintenance & repair of machines				1			Ditto
AS1045		Tool set	2	Machinery maintenance	Maintenance & repair of machines				4			These tools will be extensively used, so 2 sets are planned for two groups (total 4 sets)
AS1046		Grease gun	1	Machinery maintenance	Maintenance & repair of machines				1			One unit planned of this basic equipment
AS1047		Lube oil pump	1	Machinery maintenance	Maintenance & repair of machines				1			Ditto
KO0000		5 . Kolkand Professional College of Human Services										
KO1000		5.1 Public catering										
KO1100		5.1.1 Catering department										
KO1101		Rotary grill	1	Food preparation technique	Cooking meat etc. by rotating it in a grill permitting easy observation				1			Needed for grilling large pieces of meat
KO1102		Bakery oven	1	Bread making techniques; confection making	Bake bread				1			Part of the process of making bread
KO1103		Bakery fermentation box	1	Bread making techniques	Fermentation under controlled conditions of temperature & humidity				1			Ditto
KO1104		Steamer	2	All courses	Steaming foods				2			Used in basic processes of food preparation

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
KO1105		Coopers (cap. 20-50 liters)	1	All courses	Use not known	x	x	x	1			Eliminated owing to vagueness of actual use
KO1106		Siphon pump for oil	1	All courses	Take up oil and liquids from drum cans				1			Needed as a joint-use facility
KO1107		Mixer for forming	1	All courses	Beating				1			Basic for food preparation
KO1108		Molder	1	Bread making techniques	Permitting gas to escape from bread, & doing final molding				1			Part of the process of making bread
KO1109		Mixer for viscous materials	1	All courses	Mixing highly viscous fluids				1			Basic kitchen equipment
KO1110		Mixer for forming	1	All courses	Mixing ingredients				1			Needed for common use
KO1111		Molder	1	All courses	Forming bread shapes	x	x	x				Redundant; eliminated
KO1112		Mixer for viscous materials	1	All courses	Mixing ingredients	x	x	x				Ditto
KO1113		Fryer	2	Food preparation technique	Prepare fried foods				2			Basic kitchen equipment
KO1114		Juicer	1	All courses	Make fruit, vegetable juice				1			Ditto
KO1115		Hot storage box	1	Food preparation technique	Food storage with temperature control				1			Needed for storing ingredients during food preparation process
KO1116		Fryer	1	Food preparation technique	Frying	x	x	x				Redundant; eliminated
KO1117		Refrigerator	1	All courses	Food storage				1			Basic for food processing
KO1118		Range with oven	1	All courses	Cooking ingredients				1			Basic for food preparation
KO1119		Grille	1	Food preparation technique	Cooking meat, etc.				1			Ditto
KO1120		Bakery oven	1	Bread making; Confection making	Baking bread	x	x	x				Redundant; eliminated
KO1121		Braising pan	1	Food preparation technique	Stewing, frying, steaming ingredients				1			Basic for food preparation
KO1122		Steamer	1	Food preparation technique	Steam ingredients				1			Ditto
KO1123		Range with oven	1	Food preparation technique	Cook ingredients	x	x	x				Redundant; eliminated
KO1200		5.1.2 Bread & rolls										
KO1201		Siphon pump for oil	1	All courses	Take up oil and liquids from drum cans	x	x	x				Redundant; eliminated
KO1202		Mixer for forming	1	All courses	Mixing	x	x	x				Ditto
KO1203		Molder	1	All courses	Permitting gas to escape from bread, & doing final molding	x	x	x				Ditto
KO1204		Mixer for viscous materials	1	All courses	Mixing highly viscous fluids	x	x	x				Ditto
KO1205		Dividing and making roll dough machine	1	Bread making techniques, Confection making	Dividing dough to make rolls				1			Part of the process of making bread
KO1206		Tableware washing machine	1	All courses	Automatic washing of tableware	x	x	x				Redundant; eliminated
KO1207		Hot storage box	1	All courses	Storing ingredients at appropriate temperatures	x	x	x				Ditto
KO1208		Kneader for dough	1	Bread making techniques, Confection making	Mixing dough ingredients				1			Part of the process of making bread
KO1209		Refrigerator	1	All courses	Store foods	x	x	x				Redundant; eliminated
KO1210		Reverse sheet	1	Bread making techniques, Confection making	Stretching bread, confection dough to form sheets				1			Part of the process of making bread
KO1211		Range with oven	1	All courses	Cook ingredients	x	x	x				Redundant; eliminated
KO2000		5.2 Repair & service of radio engineering & tele-equipment										
KO2100		5.2.1 Radio electric devices study room										

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated	
									A	B	C		
KO2101		Power supplies	4	Practice use of radio equipment	Power for training equipment			x				4	Included in practice equipment enumerated below. Plans call for characteristics of elements to be covered in the Radio & TV Study Room. Use as power source
KO2102		LF signal generator	2	Practice use of radio equipment	Use as signal source for practice in using radio transmission & reception equipment. & amps			x				2	Plan for necessary number for low-frequency signal generation for radio transmitters / receivers and amps
KO2103		RF signal generator	2	Practice use of radio equipment	Not needed as signal generator for op-amps, amps, transmitters, receivers, digital pulse, power source circuit			x				2	High frequency is not required practice in working with op-amps, amps, transmitters, receivers, digital pulse, power source circuits; item eliminated
KO2104		Voltmeter	20	Practice use of radio equipment	Use for voltage measurements for op-amps, amps, transmitters, receivers, digital pulse, power source circuits			x				20	Plan for necessary number as voltmeters for op-amps, amps, transmitters, receivers, digital pulse, power source circuits, power source practice equipment. Actual number treated as peripherals for practice equipment
KO2105		Oscilloscope	10	Practice use of radio equipment	Use to measure wave forms for op-amps, amps, transmitters, receivers, digital pulse, power source circuit			x				10	Plan for necessary number for wave form measurement for op-amps, amps, transmitters, receivers, power source circuits. Actual number treated as peripherals for practice equipment
KO2106		Frequency counter	10	Practice use of radio equipment	Use as a frequency counter for practice equipment such as radio transmitters & receivers, digital pulse device			x				10	Plan for necessary number for measuring wave form of transmitters / receivers, digital pulse practice equipment. Actual number treated as peripherals for practice equipment
KO2107	1	Laboratory stands, "electronic amplifiers "	2	Practice use of radio equipment	Study basics of amplifiers				2				The op-amp is among the most basic of electric circuits, so 2 units each usable by 3 persons are planned. Simultaneous use by 6 is possible. Combined with other practice equipment this can be used by a class of 25
KO2107	2	Voltmeter	0	Practice use of radio equipment	Use in measuring waveforms of various signals				2				Plan on one unit for each unit of practice equipment owing to necessity of both learning about input & output signals to understand principles of amps, and to measure wave form:
KO2107	3	Oscilloscope	0	Practice use of radio equipment	Measuring signal voltage				2				Plan on one unit for each unit of practice equipment owing to necessity of measuring input voltage, output voltage and element voltage of circuits making up amp
KO2107	4	Functional generator	0	Practice use of radio equipment	Use as signal generator for op-amps				2				One unit planned; essential as signal source to activate amp circuits
KO2108		Stand, "radio reception devices "	2	Practice use of radio equipment	Study principles of radio transmission & reception			x				2	Request was made for 4 radio receivers and 4 transmitters; this would be a better way to learn. Plan is to supply units combining transmission & reception functions, 2 each for AM and FM; two persons can practice using a single unit so 8 persons in all can practice at the same time. Limit to Am, FM and exclusion of SSB and DSB is because popularization of latter 2 is not expected. Plan anticipated a class of 25, working with these and other pieces of equipment. The AM units are coded No. 2125 and the EM units
KO2108	1	Stand, "radio reception / sending devices"	0	Practice use of radio equipment	Study principles of radio transmission & reception				2				The 2 radio transmitter-receivers planned under this item are arguably the most important equipment for this course. Each of the transmitters and each of the receivers can be used by 2 persons so a total of 8 can practice at one time. It is expected that the equipment will be used in combination with other equipment so
KO2108	2	LF signal generator	0	Practice use of radio equipment	Use in measuring waveforms of various signals				4				Plan 2 units for each unit practice equipment because of need for signal generator (10kHz-1Mz) of carrier wave of voice signal
KO2108	3	Voltmeter	0	Practice use of radio equipment	Measuring signal voltage				4				Plan 2 units for each unit practice equipment owing to need for measuring input, output, element voltage, with measurement of received and transmitted signals separated
KO2108	4	Frequency counter	0	Practice use of radio equipment	Use in measuring waveforms of various signals				4				It will be necessary to measure the number of signal waves separately for transmitters and receivers; plan is for 2 units for each unit practice equipment

No.	Sub No.	Designation of equipment	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
								A	B	C	
KO2108	5	Oscilloscope	Practice use of radio equipment	Use in measuring waveforms of various signals				4			In order to learn the principles of amps it is necessary to measure wave forms of input signals and output signals separately at the same time, so transmitters & receivers are treated separately and 2 for every practice equipment piece are planned.
KO2108	6	RF signal generator	Practice work on radio/TV's waves	Use as signal source of high-frequency waves				4			Two units; high-frequency generator needed for both transmitter and receiver
KO2109		Stand "radio sending of the device"	Practice use of radio equipment	Study principles of radio transmission & reception			×				2 Eliminate, as being capable of only transmitting, hence not good as radio transmitter / receiver practice equipment
KO2110		Stand "intensifying devices"	Practice use of radio equipment	Study basics of amplification circuits			×				2 Eliminated due to redundancy
KO2111		Stand, "radio receivers"	Practice use of radio equipment	Study principles of radio transmission & reception			×				1 Ditto
KO2112		Stand, "radio transmitters"	Practice use of radio equipment	Study principles of radio transmission & reception			×				1 Ditto
KO2113	1	Stand, "pulse digital engineering"	Practice use of radio equipment	Study of the principles of digital pulse circuits				2			Plan on 2 units per 3 persons, reflecting need for this study item, control circuits being the most basic of electrical product circuits. Also, with other equipment items, plan expects use by classes of 2
KO2113	2	LF signal generator	Practice use of radio equipment	Use as low-frequency signal source				2			Plan one unit for each unit practice equipment because of need for signal generator (10kHz-1MHz) of carrier wave of voice signal
KO2113	3	Voltmeter	Practice use of radio equipment	Measuring signal voltage				2			Plan one unit for each unit practice equipment owing to need for measuring input, output, element voltage.
KO2113	4	Oscilloscope	Practice use of radio equipment	Use in measuring waveforms of various signals				2			Plan one unit for each unit practice equipment as it is necessary to simultaneously measure wave forms of input & output signals in order to study principles of digital pulse circuit
KO2113	5	Frequency counter	Practice use of radio equipment	Use in measuring wave frequencies of various signal				2			Plan one unit; needed to measure wave frequency of signals
KO2114		Stand, "kinds of modulation"	Practice use of radio equipment	Study the principles of radio modulation			×				1 Redundant; eliminated
KO2115		Stand, "signals of the image"	Practice use of radio equipment	Study principles of TV & radio signal modulator			×				1 Eliminated owing to redundancy (included in Radio Engineering & TV Study Room)
KO2116	1	LF signal generator	Practice use of radio equipment	Study of voice signal amplification circuits				1			Because learning about circuits that do analog amplification of voice signals is basic to the study of audio, one unit capable of use by 3 persons is planned. Simultaneous use by 3 is possible. Combine with other practice equipment this can be used by a class
KO2116	2	Power supply circuit	Practice use of radio equipment	Use as signal source for low frequencies				1			Plan one unit for each unit practice equipment because of need for signal generator (1kHz-1MHz) of carrier wave of voice signal
KO2116	3	Voltmeter	Practice use of radio equipment	Measuring signal voltage				1			Plan one unit for each unit practice equipment owing to need to measure input, output, and element voltage.
KO2116	4	Oscilloscope	Practice use of radio equipment	Use in measuring waveforms of various signals				1			Plan one unit for each unit practice equipment as it is necessary to simultaneously measure wave forms of input & output signals in order to study principles of digital pulse circuit
KO2117	1	Power supply circuit	Practice use of radio equipment	Study power source circuits				1			Being as the importance of this for study power source circuits used in electrical products is high, one unit for use by a team of 3 persons is planned. Simultaneous use by 3 is possible. Combine with other practice equipment this can be used by a class of 25
KO2117	2	Voltmeter	Practice use of radio equipment	Measuring signal voltage				1			Plan one unit for each unit practice equipment owing to need to measure input, output, and element voltage.
KO2117	3	Oscilloscope	Practice use of radio equipment	Use in measuring waveforms of various signals				1			Plan one unit for each unit practice equipment as it is necessary to simultaneously measure wave forms of input & output signals in order to study principles of digital pulse circuit
KO2118		Stand, "pulse digital engineering"	Practice use of radio equipment	Study of principles of digital pulse			×				1 Redundant; eliminated
KO2119		Basic circuits of radio-receivers	Practice use of radio equipment	Study of the principles of radio			×				1 Ditto
KO2120		Breadboard models & circuits of various detectors	Practice use of radio equipment	Study of various detector circuits			×				1 Ditto

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
KO2121		Circuits and diagrams of pulse modulation kinds	1	Practice use of radio equipment	Study of pulse modulation circuits	x	x	x				1 Eliminated; although PCM, PWM & PAM etc. are studied, this equipment is not so widely used as to justify inclusion
KO2122		Circuits of high-frequency generators	1	Practice use of radio equipment	Study high-frequency generating circuits			x				1 Eliminated as this is included in the Radio Engineering and TV Study Room
KO2123		Unwrapped circuits of tape recorders	1	Practice use of radio	Study of tape recorder circuits			x				1 Ditto
KO2124		Audio equipment	1	Radio practice	Samples of audio equipment			x				1 Ditto
KO2200		5.2.2 Radio engineering and TV study room										
KO2201		Laboratory assembly tables	15	Practice work on radio/TVs	Work table		x	x				15 Necessary equipment, but eliminated as Uzbekistan can procure this on its own
KO2202		Codoscope	1	Practice work on radio/TVs	Observation of enlarged image of parts not readily seen by the eye	x	x	x				1 Basically not needed; eliminated
KO2203	1	Unwrapped breadboard model of the TV set	1	Practice work on radio/TVs	Study TV image device circuits				2			This is an essential instrument of learning, for acquiring skills in maintaining & repair of TV receivers. Because the basic checkpoints are predetermined 4 persons can use the equipment at one time; 2 units are planned. . Simultaneous use by 8 is possible. Combine with other practice equipment this can be used by a class
KO2203	2	Color pattern generator	0	Practice work on radio/TVs	Device generating color pattern				2			Plan one unit for each unit practice equipment as this is essential for checking distortion of image (color test patterns) etc
KO2203	3	Sweep generator	0	Practice work on radio/TVs	Device that automatically changes input signals				2			Plan one unit for each unit practice equipment as this is essential for checking change in output signals caused by change in input
KO2204		Video recorder	1	Practice work on radio/TVs	Study video player circuits				2			This is an essential instrument of learning, for acquiring skills in maintaining & repair of video players. Because the basic checkpoints are predetermined 4 persons can use the equipment at one time; 2 units are planned. Simultaneous use by 8 is possible. Combine with other practice equipment this can be used by a class
KO2205		Cassette tape recorder	1	Practice work on radio/TVs	Study cassette & CD circuits				2			This is an essential instrument of learning, for acquiring skills in maintaining & repair of cassette & CD players. Because the basic checkpoints are predetermined 4 persons can use the equipment at one time; 2 units are planned. Simultaneous use by 8 is possible. Combine with other practice equipment this can be used by a class
KO2206		Amplifier (15 w)	1	Practice work on radio/TVs	Amp sample for disassembly, assembly				1			Provide one unit for instructors who have never operated this
KO2207		Columns (15 w)	2	Practice work on radio/TVs	Speaker sample for disassembly,				1			1 Ditto
KO2208		Radio-receiver	1	Practice work on radio/TVs	Radio sample for disassembly, assembly				1			1 Ditto
KO2209		Blacking out curtains	1	Practice work on radio/TVs	Curtain for interior use	x	x	x				1 Eliminated; to be procured by Uzbekistan
KO2210		Monitor	1	Practice work on radio/TVs	Monitor sample for disassembly,	x	x	x				1 Eliminated as there is no need to supply a separate monitor
KO2211		EPU	1	Practice work on radio/TVs	Actual use of an OHP in class	x	x	x				1 Eliminated; would not be frequently used
KO2212		Video camera	1	Practice work on radio/TVs	Video camera sample for disassembly, assembly				1			Equipment is related to TV; one unit planned for instructors who have never operated same
KO2213		TV tester	1	Practice work on radio/TVs	Function tests of TVs			x				1 Eliminated; included as practice equipment peripheral
KO2214		Radio tester	1	Practice work on radio/TVs	Function tests of radio circuits			x				1 Ditto
KO2215		Oscillograph (20 MHz)	4	Practice work on radio/TVs	Observe, measure wave forms			x				4 Eliminated; included as practice equipment peripheral
KO2216		Oscillograph (100 MHz)	2	Practice work on radio/TVs	Observe, measure wave forms				1			1 One 1GHZ unit planned, for measurement of signal wave forms as wave observation for UHF
KO2217		Digital generator	3	Practice work on radio/TVs	Generate signals			x				3 Eliminated; included as practice equipment peripheral
KO2218		Spectral multi meter	4	Practice work on radio/TVs	Measure strength of each wavelength of a signal				2			2 One unit, as needed, planned for checking functions of practice equipment

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
KO2219		Functional generator	1	Practice work on radio/TVs	Use in order to observe changes & differences derived from different signal sources having wide variety of wave forms, and from different types of forms.			x				1 Eliminated; included as practice equipment peripheral
KO2220		Digital LCR meter	1	Practice work on radio/TVs	Make it possible measure resistance, conductance and reactance, and to collect basic data such as energy consumption by specific equipment.				1			One unit, as needed, planned for checking functions of elements
KO2221		Logic tester	9	Practice work on radio/TVs	Use to check on-off status of digital devices			x				9 Eliminated; included as practice equipment peripheral
KO2222		Analog multi meter	17	Practice work on radio/TVs	Device makes it possible to measure voltage, resistance etc. using a single piece of equipment.			x				17 Eliminated; included as practice equipment peripheral. Radio repair workshop to provide equivalent function
KO2223		Power supply	6	Practice work on radio/TVs	Use as power source when DC is needed				5			1 Five units planned, for 5-person teams in a class of 25, for this device that is essential for testing devices & elements
KO2224		Device for measuring TV set signal	1	Practice work on radio/TVs	Device for measuring TV set signal	x	x	x				1 Little utility; eliminated
KO2225		Transistor tester	1	Practice work on radio/TVs	Device for measuring characteristics of various transistor				1			One unit, as needed, planned for checking functions of transistors
KO2226		Signal level device	1	Practice work on radio/TVs	Measurement of signal level	x	x	x				1 Low necessity; eliminated
KO2227		Projector	1	Practice work on radio/TVs	Projector	x	x	x				1 Ditto
KO2228		Video eye	1	Practice work on radio/TVs	Monitor display using video camera	x	x	x				1 Ditto
KO2229		Metal case	2	Practice work on radio/TVs	Carrying case for projector, etc.	x	x	x				2 Unnecessary; eliminated
KO2230		Wood case	2	Practice work on radio/TVs	Carrying case for projector, etc.	x	x	x				2 Ditto
KO2231		Breadboard model of a radio	1	Practice work on radio/TVs	Study principles of radio receivers			x				1 Redundant; eliminated
KO2232		B&W TV	1	Practice work on radio/TVs	B&W TV sample for disassembly, assembly	x	x	x				1 Eliminated; B&W TV not in use
KO2233		Color TV	1	Practice work on radio/TVs	Color TV sample for disassembly, assembly				1			One unit planned as instructors may not have prior experience with this
KO2234		Portable TV	1	Practice work on radio/TVs	Portable TV sample for disassembly, assembly	x	x	x				1 Eliminated owing to absence of difference from construction of color TV
KO2235		LED TV	1	Practice work on radio/TVs	LED TV sample for disassembly, assembly				1			One unit planned as instructors may not have prior experience with
KO2300		5.2.3 Radio Repair Workshop										
KO2301		Autotransformer	6	Radio repair	Power source for devices				5			1 This equipment is required for testing equipment's use of various power sources, and 5 are planned so that in a class of 25 there is one per 5-person group
KO2302		Drawing equipment	1	Radio repair	Preparing circuit diagrams		x	x				1 No special need for a drafting table is recognized; item eliminated
KO2303		Radio repair tool sets	1	Radio repair	Repair of tools				25			It will be absolutely necessary for instructors to use this equipment, so one per person is planned. Note than insulation sheets are included with tools
KO2304		Laboratory table for mounting of electric machines	1	Radio repair	Work table	x	x	x				1 Eliminated; to be procured by Uzbekistan
KO2305		Oscillograph	6	Radio repair	Use for measuring signal wave forms				5			1 Essential for repair work; one unit per 5 persons planned
KO2306		Electric soldering-iron	25	Radio repair	Use for soldering various elements			x				25 Included among tools; item eliminated
KO2307		Distributive desk on demonstrate table	1	Radio repair	Table for demonstrations	x	x	x				1 Eliminated; to be procured by Uzbekistan
KO2308		Welder apparatus of weld	6	Radio repair	Welding for antenna and antenna mounting				2			4 Because welding for the repair of antennae and their mountings is included in the scope of repair techniques, 2 units are provided to enable acquisition of this technique
KO2309		Drilling machine tool	2	Radio repair	Drill for use in attaching parts				2			Two units, as drilling of holes for installing or mounting parts is often necessary

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated	
									A	B	C		
BU1013		Pipe vise with tripod	4	Repair tools for gas supply devices	Holding gas pipe for processing				4			More than one unit is needed; this is useful when processing pipe and assembling piping	
BU1014		Flexible hose	1	Repair tools for gas supply devices	Special gas hose	x	x	x			1	Not urgent; request was rescinded, item dropped	
BU1015		Hand-operated chain hoist	2	Repair tools for gas supply devices	Raising gas equipment using a hoist				2			A frequently used item of equipment, a multiple number are needed. Max. of about 1.5 tons load would be good	
BU1016		Flame propagation and stability experimental apparatus	1	Use & repair of gas supply devices	Measuring flame propagation & stability					1		Selection & adjustment of a gas combustion device is extremely important influence on flame stability	
BU1017		Flame propagation and stability experimental apparatus	1	Use & repair of gas supply devices	Ditto	x	x	x			1	Redundant; eliminated	
BU1018		Flame propagation and stability experimental apparatus	1	Use & repair of gas supply devices	Ditto	x	x	x			1	Ditto	
BU1019		Reynolds experimental apparatus	1	Use & repair of gas supply devices	Observation of characteristics of laminar flow & turbulent flow by use of practice equipment				1			It is of basic importance to explain the behavior of fluids as being laminar flow or turbulent flow. As computer-based educational materials, this is on the costly side but the learning effects of being able to visually observe the flows would be high	
BU1020		Reynolds experimental apparatus	1	Use & repair of gas supply devices	Ditto	x	x	x			1	Redundant; eliminated	
BU1021		Resistant loss measuring apparatus	1	Use & repair of gas supply devices	Measure loss of gas flowing through pipes & joints				1			It is most effective in planning piping layouts to be able to evaluate the instant loss in pressure caused or influenced by pipe diameter, condition of interior pipe wall, connection of various fittings, an	
BU1022		Resistant loss measuring apparatus	1	Use & repair of gas supply devices	Ditto	x	x	x			1	Redundant; eliminated	
BU1023		Resistant loss measuring apparatus	1	Use & repair of gas supply devices	Ditto	x	x	x			1	Ditto	
BU2000		6.2 Installation of electric networks and equipment											
BU2001		Amperevolmeters (analog)	3	Electric equipment maintenance	Use for basic electrical experiments; measure voltage			x				3	Eliminated; substituted by BU2015
BU2002		Displaced current amperemeters (digital)	3	Electric equipment maintenance	Use for basic electrical experiments; measure current				5				Five units planned, for a class of 25 with 5 persons using one unit for basic experiments
BU2003		Batteries and capacitors	5	Electric equipment maintenance	Learn the difference between batteries and capacitors			x				5	Eliminated, as the practice equipment for capacitors can be used instead
BU2004		Sun batteries	5	Electric equipment maintenance	Learn about photovoltaic power generation				5				Five units planned, for a class of 25 with 5 persons using one unit or more for basic power creation experiments. Instrumentation: by use of the multimeter
BU2005		Baths with electrode	3	Electric equipment	Learn the principles of electrolysis				3				Three, for teaching about the relation between electricity & ions
BU2006		Low voltage power source	3	Electric equipment	Power source for electrical experiments				3				Three units planned, as power sources for practice equipment
BU2007		Universal straightens	5	Electric equipment	Power source for electrical experiments			x				5	Redundant; eliminated
BU2008		Laboratory sound generators	3	Electric equipment	Use for experiments with voice signals	x	x	x				3	Eliminated as not needed for training in basics of electricity
BU2009		Generators	5	Electric equipment	Use as generator in AC experiments			x				5	Eliminated; included in the motor practice equipment
BU2010		Hairy hydrometers	1	Electric equipment	Measure interior temperature	x	x	x				1	Eliminated; not directly related to instruction
BU2011		Semiconductor diodes on log	3	Electric equipment	Learn characteristics of diodes	x	x	x				3	Eliminated; unnecessary for this course
BU2012		Indicators of induction magnet field	1	Electric equipment maintenance	Measurement of induction magnetic fields								One unit, for teaching the basic characteristics of electric current & magnetic field;
BU2013		Variable transformer	3	Electric equipment maintenance	Power source for experiment equipment				3				Equipment is needed for testing various equipment using a power source; 3 units planned for demonstration in class
BU2014		Choke Coil	1	Electric equipment	Use for generating high-frequency	x	x	x				1	Eliminated as not being included in scope of "basics of electricity"

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
BU2015	1	AC current motor test bench	1	Electric equipment maintenance	Motor & generator experiments				1			Plans are for experiments using all 3, AC, DC and AC-DC. Two persons can work with each type of connection at one time so a total of 6 can practice at the same time. In combination with other equipment a class of 25 can be held.
BU2015	2	Volt/ammeter	0	Electric equipment maintenance	Measure current				3			Measurement of voltage & current is necessary; 3 units planned so all 3 types can be used at the same time
BU2015	3	Tacho meter	0	Electric equipment maintenance	Measure motor rotation				3			It will be necessary to measure motor rotation of practice equipment; 3 units planned so all 3 types can be used at the same time
BU2015	4	Load rheostat	0	Electric equipment maintenance	Use as resistance load				2			Two units planned, for use as resistance load, as there are 2 DC output units
BU2015	5	3-phase load rheostat	0	Electric equipment maintenance	Use as resistance load				1			One unit planned, for use as resistance load, as there is to be one AC output unit
BU2015	6	Watt meter	0	Electric equipment maintenance	Measure wattage				3			Measurement of power is necessary; 3 units planned so all 3 types can be used at the same time
BU2016	1	Electronic network test bench	1	Electric equipment maintenance	Learning how to do wiring				3			Three are planned for practice in learning wiring techniques. It is desirable for each person to work independently at wiring. Three persons can practice at the same time. With other equipment, 4
BU2016	2	Megger	0	Electric equipment maintenance	Measure insulation resistance				3			One piece per piece practice equipment planned
BU2016	3	Clamp multimeter	0	Electric equipment maintenance	Measure current				6			Two planned in view of need to measure voltage & current over entire wiring system
BU2016	4	Lux meter	0	Electric equipment maintenance	Measurement of incidental light				3			One piece per piece practice equipment planned
BU2017	3	Clamp multimeter	3	Electric equipment maintenance	Measure insulation resistance	x	x	x				3 Eliminated as it is possible to use the practice equipment
BU2018	3	Complete electro- measuring equipment for practice	3	Electric equipment maintenance	Learn method of using measuring devices	x	x	x				3 Eliminated as it is possible to use the practice equipment
BU2019	1	Prefabricated capacitors	1	Electric equipment maintenance	Learning the nature of condensers			x				1 Eliminated as it is possible to use the practice equipment to study condensers
BU2020	1	Conical conductors	1	Electric equipment maintenance	Learning the nature of coils	x	x	x				1 Eliminated as judged not being very important for this course
BU2021	3	Wheatstone bridge	3	Electric equipment maintenance	Use to measure resistance time				3			Three units for learning about the wheatstone bridge, the most basic bridge for measuring resistance & capacitance
BU2022	1	Horseshoe magnet	1	Electric equipment maintenance	Using a magnet	x	x	x				1 Eliminated as not recognized as essential for this course
BU2023	3	Milliampere meter	3	Electric equipment maintenance	Measuring low-voltage current				3			Three planned; can be used for wheatstone bridge measurement
BU2024	1	Direct current machines test bench	1	Electric equipment maintenance	Use to study DC equipment			x				1 Eliminated as this is included in the motor practice equipment
BU2025	3	Complete of capacitors	3	Electric equipment maintenance	Learn the nature of condensers				3			Three planned for use in lectures on characteristics of condensers
BU2026	1	Semi conductor completes	1	Electric equipment maintenance	Semiconductor samples	x	x	x				1 Eliminated as judged not needed for this course
BU2027	1	Completes of semi conductor	1	Electric equipment maintenance	Semiconductor tester	x	x	x				1 Ditto
BU2028	1	Radio technical set	1	Electric equipment maintenance	Testing equipment for radio	x	x	x				1 Ditto
BU2029	1	Motor tester	1	Electric equipment maintenance	Testing equipment for motors			x				1 Eliminate; included in motor practice equipment
BU2030	3	Mega ohm meter	3	Electric equipment maintenance	Measure insulation resistance			x				3 Eliminate; included in instruments for practice equipment
BU2031	3	Oscillographs	3	Electric equipment maintenance	Measuring the wave form of signals				3			Three, for investigating wave form of input power and of output power etc.
BU2032	3	Relay	3	Electric equipment maintenance	Learning the nature of relays			x				3 Eliminated as relay test practice equipment is provided by the wiring assembly kit
BU2033	3	High voltage transformer	3	Electric equipment maintenance	Learning the nature of high voltage				1			2 One unit planned for enabling learning the characteristics of high voltage in electric equipment. Used by 2 persons at same time. In combination with other equipment, a class of 25 can undertake

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
BU2034	1	Relay test bench	1	Electric equipment maintenance	Learning about guard circuits				2	1	Two practice units to enable acquisition of technique for relay tests by guard circuits in power equipment. Joint use of one piece of equipment by 2 persons so 4 persons can use equipment at same time. In combination with other equipment, a class of 25 can Two; needed to measure insulation resistance	
BU2034	2	Megger	0	Electric equipment	Measure insulation resistance				2	Two; needed to measure function of relays		
BU2034	3	Relay tester	0	Electric equipment	Measure function of relays				2	Two; needed to measure voltage		
BU2034	4	Multi tester	0	Electric equipment	Measure current				2	Two; needed to measure earth values		
BU2034	5	Earth tester	0	Electric equipment	Measure earth values				2	One unit; useful as example in classroom of principle that is basic to electrical equipment		
BU2035		Instruments for demonstration of Lenz' Law	1	Electric equipment maintenance	Learn principles of electromagnetic conductivity				1	Eliminated as judged not needed for this course		
BU2036		Instruments for demonstrating whirlwind currents and rules of action	1	Electric equipment maintenance	Set for learning about whirlwind currents	x	x	x		1	Ditto	
BU2037		Instruments for determining spectra of electric fields	1	Electric equipment maintenance	Measure radio wave spectra	x	x	x		1	Ditto	
BU2038		Instruments for determination length of sound wave	3	Electric equipment maintenance	Measure sound waves	x	x	x		1	Ditto	
BU2039		Instruments for determination length of light wave	3	Electric equipment maintenance	Light wave measurement	x	x	x		1	Ditto	
BU2040		Lab instruments for learning principles of photometer sound generators	3	Electric equipment maintenance	Photometer experiments			x		3	Eliminated; duplicated by the wiring practice equipment	
BU2041		Speedometer	1	Electric equipment maintenance	Use to perform resistance-related experiments			x		1	Redundant; eliminated. Reflected in the wiring assembly kit too.	
BU2042		Rheostat	3	Electric equipment maintenance	Use to perform resistance-related experiments				3	Three planned; needed for basic electrical experiments		
BU2043		Slide-block rheostats with roller contacts	1	Electric equipment maintenance	Use to perform resistance-related experiments			x		1	Redundant; eliminated. Reflected in the wiring assembly kit too.	
BU2044		Reohords	3	Electric equipment maintenance	Use to perform resistance-related experiments			x		3	Redundant; eliminated	
BU2045	1	Load test bench	1	Electric equipment maintenance	Measure change in current when there is a load				2	Two units for practice in measuring current change as result of a load. Two persons to jointly use one piece of the equipment; in combination with other equipment, a class of 25 can undertake practice and experiment		
BU2045	2	L CR meter	0	Electric equipment maintenance	L CR measurement				2	Two as it is necessary to measure separately reactance, capacitance and resistance components of load		
BU2045	3	Voltmeter	0	Electric equipment	Measure voltage				2	Two units necessary		
BU2045	4	Power factor meter	0	Electric equipment	Measure power factor				2	Two units necessary		
BU2045	5	Wattmeter	0	Electric equipment	Measure wattage				2	Two units necessary		
BU2046		Network light test bench	1	Electric equipment	Perform lighting experiments			x		1	Eliminated as redundant – included in wiring practice devices	
BU2047		Spectrum scopes two pipe	3	Electric equipment	Use in spectrum analysis	x	x	x		3	Eliminated as judged not needed for this course	
BU2048		Spinhariscopes	3	Electric equipment	Use in spectrum analysis	x	x	x		3	Ditto	
BU2049		Laboratory thermometers	3	Electric equipment maintenance	Learn principles of using temperature change to measure current change				3	Three units planned as this is effective for study of the principles of generation of current		
BU2050		Thermo resistors on log	3	Electric equipment maintenance	Learn principles of using temperature change to measure current change				3	Three thermistors, as sensors for temperature change		
BU2051		Thermopolis	1	Electric equipment maintenance	Learn principles of using temperature change to measure current change				1	One unit planned, as a thermal sensor		

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
BU2052		Laboratory transformers	3	Electric equipment maintenance	Use to perform resistance-related experiments			x				3 Eliminated; this is included in the practice equipment
BU2053	1	Transformers test bench	1	Electric equipment maintenance	Use to learn about method for connecting transformers, & voltage fluctuation caused by load				3			Practice in connecting transformers is essential as it is one of the most basic pieces of electrical equipment. Two persons can share one kit. Six persons can work on this at one time. Combined with other equipment, one class of 25 will be able to practice.
BU2053	2	Wattmeter	0	Electric equipment	Measuring wattage				3			Three planned; equipment is needed for measuring electricity
BU2053	3	Voltmeter	0	Electric equipment	Measure voltage				3			Three planned; equipment is needed for measuring voltage
BU2053	4	Power factor meter	0	Electric equipment	Measuring power factor				3			Three planned; equipment is needed for measuring power factor
BU2053	5	Load rheostat	0	Electric equipment	Use for load				3			Three planned; needed to provide load
BU2053	6	3-phase load rheostat	0	Electric equipment	Use for load				3			Ditto
BU2054		Universal transformers	1	Electric equipment	Use for load			x				1 Eliminated; this is included in the practice equipment
BU2055		Pipes with two electrodes	1	Electric equipment	Learn the principles of electrolysis			x				1 Redundant; eliminated
BU2056		Spectrum pipes	3	Electric equipment	Learn characteristics of spectrum pipes	x	x					3 Eliminated as unnecessary for this course
BU2057		Galvanic meteoric amplifiers	1	Electric equipment	Measurement of low-voltage current			x				1 Redundant; eliminated
BU2058		Low frequency amplifiers	1	Electric equipment	Low frequency amplifiers	x	x					1 Eliminated as judged not needed for this course
BU2059		Hand drill	0	Electric equipment maintenance	Use of hand drill for attaching distribution panels etc				3			Three planned; this is need for electrical installation work
BU2060		Coil winding	0	Electric equipment	Coil winder assembly kit				3			Coil winding assembly kits are essential; 3 are planned
BU2061		Motor sets	0	Electric equipment maintenance	Motor assembly kit				13			Practice in disassembly and assembly of motors is essential as the motor is one of the most basic pieces of electrical equipment. With 2 persons sharing one, 13 kits of a suitable type are planned.
BU2062		Trans kit	0	Electric equipment maintenance	Transformer assembly kit				13			Practice in disassembly and assembly of transformers is essential as it is one of the most basic pieces of electrical equipment. With 2 persons sharing one, 13 kits of a suitable type are planned.
BU2063	2	Distribution assembly kit	0	Electric equipment maintenance	Kit for wiring assembly				13			Use to learn techniques for actually doing wiring by use of drawings. Two persons per unit for total 13 unit.
BE0000												
BE1000												
BE1001		Autoclave	1	Dissection, Vet, surgery	Sterilization of experiment instruments, devices etc.				1			One unit planned; this is a basic device
BE1002		Apparatus for electric massage	1	Raising animals Vet.	Stress elimination & health maintenance				1			Ditto
BE1003		Blood cell counter	1	Pathology, Infectious	Blood cell count				1			Ditto
BE1004		Analytical balance	1	Pathology, Pharmacology,	High-precision weighing of various				1			Ditto
BE1005		Binocular microscopes	4	Parasitology	Observation of small organisms			x				5 High-priority item of equipment, but eliminated as BE1021 will cover.
BE1006		Big and small devices for feces of animals (set)	3	Parasitology	Examination for liver fluke				5			Ditto
BE1007		Big animal pathologo- anatomic tool	1	Dissection	Dissection				1			Essential equipment; one unit planned
BE1008		Vaginal mirror for female animals	5	Vet. obs., Pathology	Examination of vagina				5			Highly important item, hence plans are for one unit for teams of 2 or 3 persons in 13-person groups to use the equipment!
BE1009		Endoscopes	1	Pathology, Pharmacology,	Examination of stomach or large				1			Essential equipment; one unit planned
BE1010		Thermometers for animals	10	Vet. obs., Pathology	Taking temperature				13			Highly important item, hence plans are for one unit for each person in a 13-person group

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									A	B	C	
BE1011		Histological preparations set	1	Vet. physiology	Observation under the microscope of tissues from various sites in animals				1			Essential equipment; one unit planned
BE1012		Drug shooting pistol for animals	1	Pathology, Infectious diseases, Pharmacology	Facilitate administering medications to animals				1			Essential equipment; one unit planned
BE1013		Manometer for animals	5	Pathology, Infectious diseases	Measuring blood pressure				5			Highly important item, hence plans are for one unit for teams of 2 or 3 persons in 13-person groups to use the equipment!
BE1014		Tool set for measuring animal size	1	Raising animals	Measure cow size					1		Essential equipment; one unit planned
BE1015		Percussion hammer with pleximeter	2	Pathology, Infectious diseases	Diagnosis of disease				2			Two units planned as frequency of use will be somewhat high
BE1016		Injection syringe	2	Pathology, Infectious diseases	Injections				5			Highly important item, hence plans are for one unit for teams of 2 or 3 persons in 13-person groups to use the equipment!
BE1017		Urinary catheter in set	1	Pathology, Infectious diseases	Insertion into urinary tract to facilitate flow of urine					1		Essential equipment; one unit planned
BE1018		Milking catheter in set	1	Pathology	Use for mastitis					1		Ditto
BE1019		Cage for laboratory animals	2	Pathology, Infectious diseases	Restrain animals in a frame				2			Two units planned as frequency of use will be somewhat high
BE1020		Magnetic probes	1	Raising animals	Prevention of injury from a sharp metal object in the stomach				1			Essential equipment; one unit planned
BE1021		Biological microscope for students	13	Pathology, Infectious diseases	Observation & study of microorganisms & tissues				13			Highly important item, hence plans are for one unit for each person in a 13-person group
BE1022		Veterinary- obstetrical tool kit	1	Vet. obs.	Use at time of animal birth				1			Essential equipment; one unit planned
BE1023		Forceps for cutting hoofs	1	Raising animals	Trimming of hooves				1			Essential equipment; one unit planned
BE1024		Hoof examination instrument	1	Raising animals	Inspection of hooves				1			Ditto
BE1025		Tool kit, surgical, large animals	1	Vet. surgery	Devices for performing surgery on large animals				1			Essential equipment; one unit planned
BE1026		Probe for nasopharynx (nose/throat)	1	Pathology, Infectious diseases	Rubber tube for nasopharynx					1		Essential equipment; one unit planned
BE1027		Probe for oesophagus	1	Pathology, Infectious diseases	Device for removing foreign objects from oesophagus					1		Ditto
BE1028		Metal detector	1	Raising animals Pathology	Device for locating metal objects in animal bodies				1			Ditto
BE1029		Device for testing /assessing milk	1	Raising animals Pathology	Measure specific gravity of milk				1			Ditto
BE1030		Device for taking blood	1	Pathology, Infectious diseases	Taking blood samples				1			Ditto
BE1031		Device for inhalation	1	Pathology, Infectious diseases	Administration of small-particle medication to lung;				1			Ditto
BE1032		Device for mastitis	1	Pathology	Electrical device for early identification of mastitis					1		Ditto
BE1033		Device for identifying trichinosis	1	Parasitology	Inspect with microscope for trichinosis				1			Ditto
BE1034		Portable disinfections unit	1	Pathology, physiology	Spread disinfectant				1			Ditto
BE1035		Galvanized table for necrotomy of big animals	1	Dissection	Dissection of large animals				1			Ditto
BE1036		Electronic balance	1	Weighing animals	Monitoring growth; measuring size				1			Ditto
BE1037		Alcohol meter	5	Pharmacology	Determine percentage of alcohol in medications etc.				5			Highly important item, hence plans are for one unit for each 2-3 persons in a 13-person group
BE1038		Universal bench for fixing animals	1	Raising animals Pathology	Holding animals in a frame				1			Essential equipment; one unit planned
BE1039		Stetho-phonendoscope	13	Pathology, Infectious diseases	Diagnosis of disease				2			11 Frequency of use will be low and a degree of skill is required for use; plan 2 units for a 13-person group
BE1040		Table for instruments	1	Animal surgery	Array of instruments				1			Essential equipment; one unit planned
BE1041		Shelf for instruments	1	Animal surgery, pathology	Storage of instruments				1			Ditto
BE1042		Surgery table for large animals, with light stand	1	Animal surgery	For large-animal surgery				1			Ditto

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
BE1043		Surgery table for small animals, with light stand	1	Animal surgery	For small-animal surgery				1			Ditto
BE1044		Water heating apparatus with	1	Animal surgery	Heating water for washing etc.				1			Ditto
BE1045		Trocar set	4	Animal surgery	For removing foreign bodies from within animal bodies				5			Highly important item, hence plans are for one unit for each 2-3 persons in a 13-person group
BE1046		Refrigerator	1	Pharmacology, pathology	Cold-temperature storage of various materials, drugs etc				1			Essential equipment; one unit planned
BE1047		Centrifuge	1	Pharmacology, pathology, bacteriology	Separation of various materials				1			Essential equipment; one unit planned
BE1048		Syringe-injectors in set	5	Pathology, Infectious diseases	Giving injections				5			Highly important item, hence plans are for one unit for each 2-3 persons in a 13-person group
BE1049		Electrocardiograph	1	Pathology	Taking ECGs				1			Essential equipment; one unit planned
BE1050		Freezer	1	Pharmacology, pathology, Raising animal	Cold-temperature storage of materials, drugs, etc.				1			Ditto
BE1051		Electric oven with time switch	1	Pharmacology, Raising animals	For heating, drying, evaporating various materials				1			Ditto
BE1052		Cow model for insemination	1	Raising animals	For practicing artificial insemination of cows				1			Ditto
BE1053		Model of cow skeleton	1	Raising animals, animal anatomy	For study of bone structure of the cow				1			Ditto
BE1054		Model of cow internal organs, muscular system	1	Raising animals, animal anatomy	Study of organs & muscles of the cow				1			Ditto
BE1055		Drying chamber	0	Raising animals	Heating materials, instruments				1			Ditto
BE1056		Special instrument for piercing, branding, tattooing of animal	0	Raising animals	Aid for identification				1			Ditto
BE1057		Anemometer	0	Raising animals	Weather conditions monitoring for proper management of animals				1			Ditto
BE1058		Gas analyzer	0	Raising animals	Analysis of gas in barns or animal housing & activation of an alarm if limits are exceeded				1			Ditto
BE1059		Hygrometer	0	Raising animals	Humidity monitoring for general animal				1			Ditto
BE1060		Goggles	0	Raising animals	Needed when treating animals				1			Ditto
BE1061		Shedding units for horses, big-horn animals, pigs, dogs	0	Raising animals	Prevention against animals licking or biting wounds				1			Ditto
BE1062		Pregnancy calendar for agricultural animals	0	Raising animals	Monitoring pregnancy				1			Ditto
BE1063		Pincers for nose	0	Raising animals, animal anatomy	Nasal chamber inspection				1			Ditto
BE1064		Obstetrical loops	0	Raising animals	Facilitating birth of animals				1			Ditto
BE1065		Water bath	0	Raising animals	Use when disinfections of animals is called for				1			Ditto
BE1066		Syringe catheters in set	0	Raising animals	Use for artificial insemination				1			Ditto
BE1067		Egg incubator	0	Raising animals	Incubating hen eggs etc.				1			Ditto
BE1068		Auto-feeder	0	Raising animals	Automatic watering of animals				1			Ditto
BE1069		Feed mixer	0	Raising animals	Uniform mixing of feed				1			Ditto
BE1070		Infra-red lamp with stand	0	Raising animals	Warming animals				1			Ditto
BE1071		Ultraviolet lamp with stand	0	Raising animals	Mostly for sterilization				1			Ditto
BE1072		Milking machine	0	Raising animals	Milking cows				1			Ditto

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
BE1073		Wool cutters / shearing device, set with grinders	0	Raising animals	Shearing sheep				13			One per person of 13-person groups, because of need to do actual shearing during the short time availabl
BE2000		7.2 Technology for preservation of agricultural products										
BE2001		Washing machine for vegetable	2	Agro-product processing equipment	Automated washing of vegetables, fruits		×	×				2 Eliminated owing to combination of high acquisition cost and low educational effects
BE2002		Inspection conveyor	1	Agro-product processing equipment	Continuous inspection of farm produce					1		Necessary for canning process as well as for instruction on inspection & standards
BE2003		Vegetable slicer	1	Agro-product processing equipment	Slicing vegetables					1		Needed in canning process
BE2004		Frier	1	Agro-product processing equipment	Frying ingredients				1			A basic machine for food processing & necessary for canning
BE2005		Cutting table	3	Agro-product processing equipment	Used for all sorts of food preparation work				3			Basic for food processing, 3 units, considering that many persons can use a machine at the same time
BE2006		Washing machine for can	1	Agro-product processing equipment	Hot wash of cans after filling		×	×			1	Eliminated owing to very high cost and low educational value
BE2007		Can seamer and bottle capper	1	Agro-product processing equipment	Sealing cans, capping jars				1			Needed in canning process; also usable for bottling.
BE2008		Autoclave	2	Agro-product processing equipment	Pasteurization of canned & retort pouch foods				2			Needed in canning process
BE2009		Kneader	2	Agro-product processing equipment	Heating & compressing ingredients to make jam etc.				2			Necessary equipment for making jam, jelly
BE2010		Juicer	1	Agro-product processing equipment	Making juice					1		Necessary for food preparation
BE2011		Juice press	1	Agro-product processing equipment	Mechanical pressing of fruit					1		Ditto
BE2012		Mark printing machine	1	Agro-product processing equipment	Printing marks on cans				1			Necessary equipment for the canning process
BE2013		Meat chopper	1	Agro-product processing equipment	Chopping meat				1			Needed for meatpacking
BE2014		Twin screw mixer	1	Agro-product processing equipment	Combining meat & vegetables				1			Needed in canning process
UT0000		8 Urgut Professional College of Construction and National Handicraft										
UT1000		8.1 Joiner's carpentry and parquet work										
UT1001		Thickness planer	1	Joiner's carpentry and parquet work	Attaining specific thickness by planing work piece (wood)				1			Making the work piece the required thickness is an essential part of woodworking (wood processing)
UT1002		Wood lathe	1	Joiner's carpentry and parquet work	Process rod-shape work pieces (wood) by rounding, thread cutting, tapering and hollowing				1			Equipment is for turning to round shape, threading, tapering, boring etc. to make a columnar form. This equipment is necessary for such tasks
UT1003		Jointer	1	Joiner's carpentry and parquet work	Form a standard surface on the work piece (wood)				1			Essential for processing wood
UT1004		Tenon cutting machine	1	Joiner's carpentry and parquet work	Process a tenon on the work piece				1			Mortise & tenon is commonly used for joining wood. A machine for this is necessary and standard equipment in woodworking shops
UT1005		Saw sharpening machine	1	Joiner's carpentry and parquet work	Sharpen blades of circular saws, planes and other tools				1			Sharpening blades frequently is part of working with wood. A standard piece of equipment is needed for that purpose.
UT1006		Mortising machine	1	Joiner's carpentry and parquet work	Form a mortise for a tenon on the work piece (wood)				1			A standard piece of equipment

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
UT1007		Portable circular saw	1	Joiner's carpentry and parquet work	Cut the work piece (wood)				1			Hand-held drills are basic tools for working with wood
UT1008		Router machine	1	Joiner's carpentry and parquet work	Cut a decorative surface in the work piece (wood), do routing, cutout work, sculpting				1			Decorative carving, groove forming, hollowing, sculpting etc. is done with a router and used for doors, window frames, bowls and other items. Indispensable for a woodworking shop
UT1009		Electric floor sander	1	Parquet works	Getting smooth surface after parquet is laid				1			Hand-held but electric-powered, this tool is standard equipment for shops & used for smoothing floors
UT1010		Electric floor planer	1	Parquet works	Getting smooth surface after parquet is				1			Ditto
UT1011		Electric floor polisher	1	Parquet works	Getting smooth surface after parquet is				1			Ditto
UT1012		Belt sander	1	Joiner's carpentry and parquet work	Grinding and polishing surfaces (wood)				1			Equipment is standard & needed for preparing surfaces
UT1013		Pedestal grinder	1	Joiner's carpentry and parquet work	Grinding, sharpening machine tools, metal goods				1			For grinding and sharpening metal tools & cutting edges; standard equipment
UT1014		Portable electric planer	1	Joiner's carpentry and parquet work	Smooth surfaces (wooden) using a plane				1			Hand-held, electric planes are standard shop equipment
UT1015		Circular saw	1	Joiner's carpentry and parquet work	Cutting materials (wood)				1			Standard equipment
UT1016		Spray gun with air compressor	1	Joiner's carpentry and parquet work	Painting				1			Standard equipment for applying paint
UT1017		Lacquer sprayer	1	Joiner's carpentry and parquet work	Painting				1			Standard equipment for applying varnish, lacquer
UT1018		Radial saw	1	Joiner's carpentry and parquet work	Cut the work piece (wood) at various angles, and form grooves				1			Used for special cutting requirements such as cutting at an angle to the wood surface, cutting grooves etc. Standard equipment
UT1019		Saw blade set	1	Joiner's carpentry and parquet work	Circular saw blade				1			Standard equipment. Interchangeable blades enable diverse tasks to be accomplished
UT1020		Carpentry tools set	1	Joiner's carpentry and parquet work	General hand-processing of wood				1			Standard equipment
UT1021		Hand saw	12	Joiner's carpentry and parquet work	Cut by hand the work piece (wood)				13			Standard equipment
UT1022		Wood chisel set	12	Joiner's carpentry and parquet work	Form a hole by hand in the work piece (wood)				13			Standard equipment
UT1023		Jack plane	12	Joiner's carpentry and parquet work	Hand-plane the surface of a work piece (wood)				13			Standard equipment
UT1024		Smoothing plane	12	Joiner's carpentry and parquet work	Hand-plane the surface of a work piece (wood)				13			Ditto
TA0000		9. Tashkent Technologic Professional College										
TA1000		9.1 Food processing (bread, sweets, macaroni, confections)										
TA1001		Automatic scale	2	Production Equipment & Technology (Confections making)	Measuring ingredients	x	x	x				2 Not or urgent necessity, eliminated after request was withdrawn
TA1002		Flour scale	2	Production Equipment & Technology (Confections making)	Measuring flour	x	x	x				2 Ditto
TA1003		Flour, sugar sifter	2	Production Equipment & Technology (Confections making)	Mixing and adding flour, sugar etc. for making tortes (cakes) and cookies of flour, sugar etc.							1 Corresponds to the first step in cake making. Two units were requested but one is to be supplied in line with number of other pieces of equipment

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
TA1004		Fat etc. melting unit	2	Production Equipment & Technology (Confections making)	Melting fat, shortening etc.	x	x	x			2	Not or urgent necessity; eliminated after request was withdrawn
TA1005		Automatic water dispenser	2	Production Equipment & Technology (Confections making)	Measurement of water	x	x	x			2	Ditto
TA1006		Dough mixer	2	Production Equipment & Technology (Bread making practice)	Mix dough				2			Mixing or kneading the dough is extremely important. Two units to be provided, as requested
TA1007		Dough mixer	1	Production Equipment & Technology (Bread making practice)	Ditto	x	x	x			1	Redundant; eliminated
TA1008		Dividing and making roll dough machine	1	Production Equipment & Technology (Bread making practice)	Precise dividing of bread dough and forming of divided pieces				1			It is extremely important to divide the dough into equal parts to make loaves
TA1009		Paste rounding unit	2	Production Equipment & Technology (Bread making practice)	Ditto	x	x	x			2	Not or urgent necessity; eliminate after request was withdrawn
TA1010		Dough trays	2	Production Equipment & Technology (Bread making practice)	Transporting dough for bread etc. to next step	x	x	x			2	Ditto
TA1011		Cupboard	1	Production Equipment & Technology (Bread making practice)	Stacking, storing dinnerware	x	x	x			1	Ditto
TA1012		Bakery oven	1	Production Equipment & Technology (Bread making practice)	Bread oven				1			Rigorous control of temperature, humidity and time is necessary for proper baking of bread. For this reason, a special oven is required
TA1013		Macaroni press & extruder	1	Production Equipment & Technology (Macaroni making practice)	Extruding and forming macaroni				1			Macaroni is made by using either a press or a forming machine. A machine usable for both methods is selected
TA1014		Flour dispenser	3	Candy making practice	Make up a production line for candy making	x	x	x			3	Not or urgent necessity; eliminate after request was withdrawn
TA1015		Screening machine of flour and sugar	3	Candy making practice	Ditto	x	x	x			3	Ditto
TA1016		Automatic scale	2	Candy making practice	Ditto	x	x	x			2	Ditto
TA1017		Flour dispenser	2	Candy making practice	Ditto	x	x	x			2	Ditto
TA1018		Screening machine of flour and sugar	2	Candy making practice	Ditto	x	x	x			2	Ditto
TA1019		Centrifuge for separation of flow	1	Candy making practice	Ditto	x	x	x			1	Ditto
TA1020		Pumps for viscous liquid	1	Candy making practice	Ditto	x	x	x			1	Ditto
TA1021		Boiling pot for confectionery	1	Candy making practice	Ditto	x	x	x			1	Ditto
TA1022		Vacuum pan	1	Candy making practice	Ditto	x	x	x			1	Ditto
TA1023		Chain candy cutting machine	1	Candy making practice	Ditto	x	x	x			1	Ditto
TA1024		Press for confection molding	1	Candy making practice	Ditto	x	x	x			1	Ditto
TA1025		Disk cutter for candy	1	Candy making practice	Ditto	x	x	x			1	Ditto
TA1026		Guillotine cutter for candy	1	Candy making practice	Ditto	x	x	x			1	Ditto
TA1027		Glazer	1	Candy making practice	Ditto	x	x	x			1	Ditto

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
TA1028		Molder	1	Production Equipment & Production Technology	Release of gas from bread dough and final forming of dough				1			The machine called "molder" is needed to permit gas to escape from the bread after primary fermentation, and to form it.
TA1029		Temperer	1	Production Equipment & Production Technology (Bread making practice)	Mixing and kneading bread dough	x	x	x				Not of urgent necessity; eliminated after request was withdrawn
TA1030		Grinding mill for recovery product	1	Production Equipment & Production Technology (all courses)	Crushes recovered product not to be sent from bakery				1			General-purpose equipment for common use in all courses. Use to recycle major product
TA1031		Bakery oven for cookies	1	Production Equipment & Production Technology (Confections making)	Oven for baking cookies				1			Specifications can be almost identical to those of a bread oven, but this can be used in another process separately from others.
TA1032		Macaroni dough kneader	1	Production Equipment & Production Technology (Macaroni making practice)	Mixing and kneading macaroni dough				1			Mixing is as important for macaroni as for bread; a specialized machine is needed
TA1033		Wafer cutter	1	Production Equipment & Production Technology (Confections making)	Cutting baked wafers				1			Cutting must be done with a specially sharp knife so that the wafer does not break up. A specialized piece of equipment is required
TA1034		Cookie pressing machine	1	Production Equipment & Production Technology (Confections making)	Cutting cookies				1			Automatic cutting of cookies from dough sheet
TA1035		Eclair form	1	Production Equipment & Production Technology (Confections making)	Making dough for eclairs	x	x	x				Not of urgent necessity; eliminated after request was withdrawn
TA1036		Mixer for viscose substances	1	Production Equipment & Production Technology (Confections making)	Making dough for cookies				1			Mixing is as important for cake as for bread; a specialized machine is needed
TA1037		Cookie decoration machine	4	Production Equipment & Production Technology (Confections making)	Cookie decoration	x	x	x				Not of urgent necessity; eliminated after request was withdrawn
TA1038		Eclair former	1	Production Equipment & Production Technology (Confections making)	Forming dough for eclairs				1			A specialized piece of equipment is required
TA1039		Kneader for biscuit and cream	1	Production Equipment & Production Technology (Confections making)	Kneading biscuit dough and cream				1			Ditto
TA1040		Gingerbread fermentation box	4	Production Equipment & Production Technology (Confections making)	Steaming dough	x	x	x				Not of urgent necessity; eliminated after request was withdrawn
TA1041		Emulsion mixer	1	Production Equipment & Production Technology (Confections making)	Making emulsions for waffle production				1			A specialized piece of equipment is desirable
TA1042		Waffle making apparatus	1	Production Equipment & Production Technology (Confections making)	Toasting waffles				1			A specialized piece of equipment is required
TA1043		Paste coating machine	1	Production Equipment & Production Technology (Confections making)	Coating with paste for between wafers				1			Ditto
TA1044		Bread fermentation box	1	Production Equipment & Production Technology (Confections making)	Causing bread to rise by controlling temperature and humidity				1			Ditto
TA1045		Twist wrap machine for candy	1	Candy making practice	Wrapping candy	x	x	x				Not of urgent necessity; eliminated after request was withdrawn

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
TA1046		Twist-wrap machine for chocolate	1	Production Equipment & Technology (Confection making practice)	Wrapping chocolate	x	x	x	1			1 Ditto
TA1047		Twist-wrap machine for cookies, wafers	1	Production Equipment & Technology (Confection making practice)	Wrapping cookies, wafers				1			An automatic wrapping machine is planned for the sake of hands-on practice
TA1048		Macaroni drier	1	Production Equipment & Technology (Confection making practice)	Drying macaroni				1			Special ambient conditions are required for drying of macaroni, meaning a special machine is required
TA1049		Reverse sheet	1	Production Equipment & Technology (Macaroni making practice)	Rolling bread dough, cookie dough				1			Needed for pie crusts etc.
TA2000		9.2 Operation and maintenance of eq										
TA2001		Air separator	1	Operation, maintenance & repair of milling equipment	Removing chaff etc. from materials (wheat, rye, oats) by movement of air				1			One of the pieces of equipment in the milling process. A small-scale type is planned, based on actualities of mill operation
TA2002		Vibration separator	1	Operation, maintenance & repair of milling equipment	Sifting grain by use of an oscillating sieve				1			Ditto
TA2003		Disk cleaner for grain	1	Operation, maintenance & repair of milling equipment	Removal of weeds from grain through rotation of a disc					1		Ditto
TA2004		Disk cleaner for grain separating wild oat	1	Operation, maintenance & repair of milling equipment	Removal of weeds from grain through rotation of a disc		x	x				1 Eliminated; redundant
TA2005		Vibration stone separator	1	Operation, maintenance & repair of milling equipment	Removal of pebbles etc.		x	x				1 Ditto
TA2006		Magnetic separator	1	Operation, maintenance & repair of milling equipment	Removal of metal by use of a magnet				1			One of the pieces of equipment in the milling process. A small-scale type is planned, based on actualities of mill operation
TA2007		Grain flow meter	1	Operation, maintenance & repair of milling equipment	Measuring flow of powdered substance				1			Ditto
TA2008		Dosing mechanism for grain	1	Operation, maintenance & repair of milling equipment	Continuous stable supply system for compound fertilizer manufacture					1		Ditto
TA2009		Wet grain pilling machine	1	Operation, maintenance & repair of milling equipment	Removing seed covers from wet grain				1			Ditto
TA2010		Polishing machine for grain	1	Operation, maintenance & repair of milling equipment	Reduction of rate of inclusion of inner surface of grain					1		Ditto
TA2011		Sieving machine for grain	1	Operation, maintenance & repair of milling equipment	Sifting flour					1		Ditto
TA2012		Sieving machine for wheat	1	Operation, maintenance & repair of milling equipment	Sifting flour		x	x				1 Eliminated because similar equipment is requested
TA2013		Peeler machine	1	Operation, maintenance & repair of milling equipment	Removing coat from grain by using rubber rollers turning at different rates				1			One of the pieces of equipment in the milling process. A small-scale type is planned, based on actualities of mill operation
TA2014		Bucker.	1	Operation, maintenance & repair of milling equipment	Milling grain					1		Ditto
TA2015		Mixer for foders	1	Operation, maintenance & repair of milling equipment	Combine animal feed ingredients using a 2-shaft ribbon-type				1			Ditto
TA2016		Roller mill	1	Operation, maintenance & repair of milling equipment	Milling wheat to flour				1			Ditto
TA2017		Threshing machine	1	Operation, maintenance & repair of milling equipment	Extracting germ					1		Ditto
TA2018		Miniature mill system	1	Operation, maintenance & repair of milling equipment	Model demonstration of workings of miniaturized milling machines		x	x				1 Eliminated – would require special order; learning effects would be weak

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
CM0000												
CM0001		10. Common equipment for 9 Professional College Overhead projector	16	Common equipment	Classroom use				9			7 IDSSVE is strongly in favor of use of the OHP in education & training. One OHP is to be provided for each of the schools
CM0002		Video camera (handy type)	16	Common equipment	Recording of education, training sessions for circulation to other schools				9			7 Many schools have no equipment to mention, but textbooks alone will not be effective for the learning process. Making video recordings of such activities as the actual or demonstration use of equipment will be necessary to overcome that shortcoming. One unit for each school is planned. Editing of videos can be done.
CM0003		LCD projector with screen	16	Common equipment	Display from video monitors or computer monitors / display panels				9			7 IDSSVE is pro-actively supporting this educational project. To assist this effort it would be effective to have computers that can process both Russian- and Uzbek –language technical explanations. One such computer is planned for each of the schools
CM0004		Computer and monitors	16	Common equipment	Preparation of materials	x	x	x				16 Eliminate; video editing to be done by equipment mentioned immediately below
CM0004		Video authorization system	0	Common equipment	Preparation of materials				9			One planned for each school as this is indispensable for video
CM0005		Laser printer	16	Common equipment	Printing of educational materials	x	x	x				16 Redundant; eliminated
CM0006		Scanner	9	Common equipment	Input of drawings, photos etc to computer memory	x	x	x				9 Ditto
CM0007		Mini bus (24 seater)	9	Common equipment	Visits to factories, attendance at seminars, observation trips etc. for retraining				9			Public transport in Uzbekistan with the exception of central Tashkent is not well developed; moving 25 persons at a time is not easily done. The operation plan is well worked out and factory visits etc. would be effective ways to learn. One planned for each
C00000												
C10000		11. IDSSVE, CSSVE, & regional centers										
C10001		11.1 CSSVE Server computer	1	CSSVE	Communications between IDSSVE & regional centers	x	x	x				1 Eliminated as not having direct relation to retraining
C10002		Printer	1	CSSVE	Printing of materials	x	x	x				1 Ditto
C10003		Modem	1	CSSVE	External connections	x	x	x				1 Ditto
C10004		UPS	1	CSSVE	Computer power interruption safeguard	x	x	x				1 Ditto
S00000		11.2 IDSSVE (Headquarters)										
S10000		11.2.1 Server Section										
S10001		Proxy/mail server	1	Server Section	Internet server	x	x	x				1 Eliminated as not having direct relation to retraining
S10002		Fire wall /DNS server	1	Server Section	Internet server	x	x	x				1 Ditto
S10003		Network computer	1	Server Section	Network management	x	x	x				1 Ditto
S10004		Web designer computer	1	Server Section	Web page design	x	x	x				1 Ditto
S10005		UPS	2	Server Section	Computer power interruption safeguard	x	x	x				2 Ditto
S10006		Laser printer	1	Server Section	Printing of materials	x	x	x				1 Ditto
S10007		(Local area network equipment)										
S10008		Hub	2	Server Section	Distribution of data via telecom system	x	x	x				2 Eliminated as not having direct relation to retraining
S10009		Modem	5	Server Section	External communication	x	x	x				5 Ditto
S10010		Air conditioner	1	Server Section	Interior temperature control	x	x	x				1 Ditto
S20000		11.2.2 Secondary Special & Professional Education Problem Laboratory										
S20001		Digital camera	1	Second. Spec. & Prof. Edu. Problem Lab	Photographing educational materials	x	x	x				1 Eliminated as not having direct relation to retraining

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
S20002		Digital video camera	1	Second. Spec. & Prof. Edu. Problem Lab	Video recording of educational materials	x	x	x			1	Ditto
S20003		Computer	6	Second. Spec. & Prof. Edu. Problem Lab	Preparation of manuscripts etc.; communication with other departments	x	x	x			6	Ditto
S20004		Computer (notebook)	1	Second. Spec. & Prof. Edu. Problem Lab	Preparation of manuscripts etc.	x	x	x			1	Ditto
S20005		Multimedia projector with screen	1	Second. Spec. & Prof. Edu. Problem Lab	Classroom-use equipment	x	x	x			1	Ditto
S20006		Video eye	1	Second. Spec. & Prof. Edu. Problem Lab	Display of classroom conditions, also usable as OHP	x	x	x			1	Ditto
S20007		TV video set	1	Second. Spec. & Prof. Edu. Problem Lab	Display of video teaching materials	x	x	x			1	Ditto
S20008		Tape recorder	1	Second. Spec. & Prof. Edu. Problem Lab	Recording and playback of voice, recording of lectures, dictation, etc.	x	x	x			1	Ditto
S20009		Fax	1	Second. Spec. & Prof. Edu. Problem Lab	Communication between/with regional, other departments centers	x	x	x			1	Ditto
S20010		UPS	6	Second. Spec. & Prof. Edu. Problem Lab	Computer power interruption safeguard	x	x	x			6	Ditto
S20011		Scanner (A4)	1	Second. Spec. & Prof. Edu. Problem Lab	Input of drawings & photos to computer memory	x	x	x			1	Ditto
S20012		Laser printer	5	Second. Spec. & Prof. Edu. Problem Lab	Printing of materials	x	x	x			5	Ditto
S20013		Color printer	1	Second. Spec. & Prof. Edu. Problem Lab	Printing of materials	x	x	x			1	Ditto
F00000		11.3 IDSSVE (Faculty)										
F10000		11.3.1 Server Section										
F10001		Proxy/mail server	1	Server Section	Internet server				1			One planned, being essential for use as proxy switching between inside IP and outside IP addresses, and for mail
F10002		Fire wall / DNS server	1	Server Section	Internet server				1			One unit as a DNS device will be needed for a firewall & searching for other parties' IP addresses. Web server to be external
F10003		Network computer	1	Server Section	Network management				1			One computer, for making home page planned for mail use when retaining inquiries are made via the home page. Also will function as a network computer
F10004		Web designer computer	1	Server Section	Computer for web designer use	x	x	x			1	Use of network computer will suffice
F10005		UPS	2	Server Section	Computer power interruption safeguard				3			Essential for network equipment; 3 planned
F10006		Laser printer (LAN equipment)	1	Server Section	Printing of materials				1			One unit planned for printing of materials
F10007		Hub A	1	Server Section	Distribution of telecom data							
F10008		Hub B	1	Server Section	Distribution of telecom data				1			Hub is planned as router partitioning inside and outside, and for
F10009		Modem	5	Server Section	Modem for external communication				9			Needed; 9 hubs needed for connecting all network equipment
F10010		Radio modem	1	Server Section	Modem for external communication	x	x	x	2			3 When a department creates a home page, a dial-up modem is suitable; 2 are planned
F10011		Fax	1	Server Section	Communication between/with regional centers, other departments	x	x	x				1 Eliminated; little value in having a radio modem
F10012		Air conditioner	1	Server Section	Interior temperature control	x	x	x				1 Eliminated; no need for fax it there is a mail server
F20000		11.3.2 Administration Office										
F20001		Computer	3	Admin. Office	Management of equipment	x	x	x				3 Eliminate, owing to dispersed control of equipment
F20002		Laser printer	3	Admin. Office	Print materials	x	x	x				3 Ditto

No.	Sub No.	Designation of equipment	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
								A	B	C	
F20003		UPS	3 Admin. Office	Computer power interruption safeguard	x	x	x			3	Ditto
F20004		Copy machines	1 Admin. Office	Document reproduction	x	x	x			1	Ditto
F20005		Computer (notebook type)	1 Admin. Office	Equipment management	x	x	x			1	Ditto
F20006		Fax	1 Admin. Office	Communication between/with regional centers, other departments	x	x	x			1	Eliminated; no need for fax it there is a mail server
F20007		Air conditioner	3 Admin. Office	Interior temperature control	x	x	x			3	Eliminated as not having direct relation to retraining
F30000		11.33 Chair of information									
F30001		Computer	5 Chair of information	Creation of teaching materials				2		3	CSSVE is promoting IT education; 2 units planned for retraining
F30002		Laser printer	1 Chair of information	Printing of materials	x	x	x			1	Eliminated owing to duplication by printing machines
F30003		UPS	5 Chair of information	Computer power interruption safeguard	x	x	x			5	Not necessary as notebook type computers are planned
F30004		Fax	1 Chair of information	Communication between/with regional centers, other departments	x	x	x			1	Eliminated as a fax is not needed if there is a mail server
F30005		Scanner	1 Chair of information	Input of drawings & photos to computer memory				1			One unit planned as this is effective for making educational materials. Can be used for scanning when needed for other course materials.
F30006		Color printer	1 Chair of information	Printing of materials				1			One printer planned for color printing of educational materials. Can be used for printing when needed for other courses
F30007		Air conditioner	1 IT course	Interior temperature control	x	x	x			1	Eliminated; no need for air conditioning
F40000		11.34 Chair of Professional Methods									
F40001		Computer	1 Professional education	Preparation of educational materials				1			One unit planned for preparation of educational materials
F40002		Laser printer	1 Professional education	Printing of materials				1			One unit planned for printing of educational materials
F40003		UPS	1 Professional education	Computer power interruption safeguard	x	x	x			1	Not necessary as notebook type computers are planned
F40004		Air conditioner	1 Professional education	Interior temperature control	x	x	x			1	Eliminated; no need for air conditioning
F50000		11.35 Educational psychology course									
F50001		Computer	1 Educational psychology	Preparation of educational materials				1			One unit planned for preparation of educational materials
F50002		Laser printer	1 Educational psychology	Printing of materials				1			One unit planned for printing of educational materials
F50003		UPS	1 Educational psychology	Computer power interruption safeguard	x	x	x			1	Not necessary as notebook type computers are planned
F50004		Air conditioner	1 Educational psychology	Interior temperature control	x	x	x			1	Eliminated; no need for air conditioning
F60000		11.36 Chair of Economy & Management									
F60001		Computer	1 Chair of eco. & mgmt	Preparation of educational materials				1			One unit planned for preparation of educational materials
F60002		Laser printer	1 Chair of eco. & mgmt	Printing of materials				1			One unit planned for printing of educational materials
F60003		UPS	1 Chair of eco. & mgmt	Computer power interruption safeguard	x	x	x			1	Not necessary as notebook type computers are planned
F60004		Air conditioner	1 Chair of eco. & mgmt	Interior temperature control	x	x	x			1	Eliminated; no need for air conditioning
F70000		11.37 Public subjects chair									
F70001		Computer	1 Public subjects chair	Creation of teaching materials				1			One unit planned for preparation of educational materials
F70002		Laser printer	1 Public subjects chair	Printing of materials				1			One unit planned for printing of educational materials
F70003		UPS	1 Public subjects chair	Computer power interruption safeguard	x	x	x			1	Not necessary as notebook type computers are planned
F70004		Air conditioner	1 Public subjects chair	Interior temperature control	x	x	x			1	Eliminated; no need for air conditioning
F80000		11.38 Five courses									
F80001		Computer	5 Classroom	Storage in memory of data on contents of instruction						5	Shared use of notebooks in each department
F80002		Scanner (A4)	5 Classroom	Scan images & drawings for computer input	x	x	x			5	Not fundamentally required but scanners are to be used in IT lectures when explaining scanner function
F80003		Multimedia projector with screen	5 Classroom	Display lecture content				3		2	Three units planned for shared use in 5 departments by moving them to the department where needed; one to be moved when needed to the Conference Hall

No.	Sub No.	Designation of equipment	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
								A	B	C	
F80004		OHP	Classroom	Display lecture content				3		2	Ditto
F80005		Video eye	Classroom	Display lecture content				3		2	Ditto
F80006		UPS	Classroom	Computer power interruption safeguard	x	x	x			5	Not needed for notebook type; eliminated
F80007		Blackboard	Classroom	Classroom teaching aid				5			Blackboard planned for each classroom
F80008		Stand board	Classroom	Display teaching materials				3		2	Three units planned for shared use in 5 departments by moving them to the department where needed; one to be moved when needed to the Conference Hall
F80009		Air conditioner	Classroom	Interior temperature control	x	x	x			5	Eliminated; no need for air conditioning
F90000		11.39 Conference Hall (150 seats)									
F90001		Computer	Conference Hall	Storage in memory of data on contents of instruction			x			1	Eliminated; as equipment is to be used in each class
F90002		UPS	Conference Hall	Computer power interruption safeguard	x	x	x			1	Eliminated; notebook type not necessary
F90003		Multimedia projector with screen	Conference Hall	Display teaching materials			x			1	Eliminated; as equipment is to be used in each class
F90004		OHP	Conference Hall	Display teaching materials			x			1	Ditto
F90005		Audio video set for hall	Conference Hall	Broadcast facilities				1			Planned: mike, speaker, amp, CD/DVD, cassette, TV etc.
F90006		Audio tape recorder	Conference Hall	Recording & broadcasting of data on contents of instructor			x			1	Eliminated; included in broadcasting equipment
F90007		OHP	Conference Hall	Display teaching materials			x			1	Eliminated; as equipment is to be used in each class
F90008		Video eye	Conference Hall	Display teaching materials			x			1	Ditto
F90009		Electronic board	Conference Hall	Display & record teaching materials	x	x	x			1	Not needed; eliminated
F90010		Stand board	Conference Hall	Display teaching materials			x			1	Eliminated; as equipment is to be used in each class
F90011		TV and video set	Conference Hall	Display teaching materials			x			1	Eliminated; included in broadcasting equipment
F90012		Video camera	Conference Hall	Video recording of lectures etc.				1		1	Lectures & other activities will be recorded as video. The IT computer will be used for editing
F90013		CD & DVD player	Conference Hall	Broadcasting of lectures			x			1	Eliminated; included in broadcasting equipment
F90014		Speaker (studio)	Conference Hall	Voice amplification			x			1	Ditto
F90015		Microphone (studio)	Conference Hall	Voice recording			x			5	Ditto
F90016		Earphone	Conference Hall	Listening by simultaneous interpreters	x	x	x			150	Not needed; eliminated
F90017		Copy machine	Conference Hall	Contact with other sections	x	x	x			1	Ditto
F90018		Air conditioner	Conference Hall	Interior temperature control	x	x	x			3	Air conditioning not needed; eliminated
FA0000		11.3.10 Digitalized library									
FA0001		Server computer	Library	Storage of book database				1		1	One unit planned, for storage of book database
FA0002		Computer	Library	Input, display of book database information				1		14	One planned for making the database of books etc. Also usable for video editing
FA0003		UPS	Library	Computer power interruption safeguard				2		18	Two planned; necessary as network equipment
FA0004		Laser printer	Library	Printing documents				1		1	One unit planned, for display of materials
FA0005		Multimedia projector with screen	Library	Display materials				1		1	One unit planned, for display of materials
FA0006		OHP	Library	Display materials	x	x	x			1	Eliminated; video eye not needed in departments giving lectures
FA0007		Copy machine (A3)	Library	Materials copy service				1		1	One unit provided as copying of materials is indispensable
FA0008		Video conference system	Library	Video (TV) conference system	x	x	x			16	Not needed; eliminated
FA0009		Video eye	Library	Display materials	x	x	x			1	Eliminated; video eye not needed in departments giving lectures
FA0010		TV-video	Library	Showing educational videos				1		1	One unit planned, for display of educational videos
FA0011		Video camera	Library	Making educational videos				1		1	One unit for making educational videos. Simple modification
FA0012		TV tuner	Library	Reception of TV, broadcast materials	x	x	x			1	Redundant; eliminated

No.	Sub No.	Designation of equipment	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
								A	B	C	
FA0013		Satellite antenna	1 Library	Reception of satellite transmission	x	x	x	1			1 Not needed; eliminated
FA0014		Blackboard	1 Library	Display of notes etc.				1			Blackboard deemed necessary and one is planned
FA0015		Stand board	1 Library	Display of notes etc.				1			One planned for showing lecture information etc.
FA0016		Air conditioner	3 Library	Interior temperature control	x	x	x				3 Air conditioning not needed; eliminated
FB0000		11.3.11 Mini printing room									
FB0001		Server computer	1 Mini printing room	Storage of database for mini printing			x				1 Eliminated as function is concentrated in the printing server
FB0002		Computer	3 Mini printing room	Data input & editing			x				3 Eliminated as function is concentrated in the printing room
FB0003		UPS	5 Mini printing room	Computer power interruption safeguard			x				5 Ditto
FB0004		Scanner (A1, color)	1 Mini printing room	Input of drawings & photos to computer memory			x				1 Ditto
FB0005		Laser printer	1 Mini printing room	Printing of materials; check manuscript			x				1 Ditto
FB0006		Laser printer (color)	1 Mini printing room	Printing of materials; check manuscript			x				1 Ditto
FB0007		Plotter (A1, color)	1 Mini printing room	Color matching for printing			x				1 Ditto
FB0008		Digital printer (A3, color)	1 Mini printing room	Mini-printing machine (mimeograph)			x				1 Ditto
FB0009		Copy machine (A4)	1 Mini printing room	Copying materials			x				1 Ditto
FB0010		Copy machine (A3)	1 Mini printing room	Copying materials				1			Not included in equipment for the printing room. One planned as low-run copying can be done more cheaply using the cop-
FB0011		Air conditioner	2 Mini printing room	Interior temperature control	x	x	x				2 Air conditioning not needed; eliminated
FC0000		11.3.12 Printing house									
FC1000		(Preprinting)									
FC1100		(Design section)									
FC1101		Server computer	1 Design section	Storage of manuscripts etc. for printing				1			One planned, for storage of manuscripts etc.
FC1102		Computer	2 Design section	Editing, preparation of manuscripts				2			Two planned, for input of handwritten materials to be used as text for retraining
FC1103		UPS	5 Design section	Computer power interruption safeguard				3			Three planned; necessary as network equipment
FC1104		Hub	2 Design section	Distribution of telecom data			x				2 Eliminated; use unit installed in server room
FC1105		(LAN equipment)									
FC1106		Scanner, drum	1 Design section	Input of drawings & photos to computer memory	x	x	x				1 Eliminated; flat-bed scanner is adequate
FC1107		Scanner, flat bed	2 Design section	Input of drawings & photos to computer memory				1			1 One flat-bed scanner planned
FC1108		Color test printer	1 Design section	Control of color				1			One unit to ensure color reliability
FC1109		Printer (A4, color)	1 Design section	Printing of materials; check manuscript	x	x	x				1 Eliminated; one each of A3 and A4 color printers is sufficient
FC1110		Laser printer (A4, color)	1 Design section	Printing of materials; check manuscript				1			One A3 color unit planned, for proofing
FC1111		Printer (A3, color)	1 Design section	Printing of materials; check manuscript				1			One A3 color unit planned, for proofing
FC1112		Laser printer (A3, color)	1 Design section	Printing of materials; check manuscript	x	x	x				1 Eliminated; one each of A3 and A4 color printers is sufficient
FC1113		Air conditioner	1 Design section	Interior temperature control	x	x	x				1 Air conditioning not needed; eliminated
FC1200		Computer composition section									
FC1201		Computer	3 Design section	Editing material for printing				3			Three, for editing manuscripts for printing; number to match the number of printing machines.
FC1202		UPS	5 Design section	Computer power interruption safeguard				3			Three; essential as network devices.
FC1203		Scanner (flat bed)	1 Design section	Input of drawings & photos to computer memory	x	x	x				1 Eliminated; flat-bed scanner will suffice
FC1204		Laser printer (A4)	1 Design section	Printing of materials; check manuscript	x	x	x				1 Eliminated as manuscript check function is provided by another
FC1205		Assembly table	1 Design section	Layout work				1			One unit, needed for positioning material in layout work

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
FC1206		Air conditioner	1	Design section	Interior temperature control	x	x	x	1		1	Air conditioning not needed; eliminated
FC2000		(Printing department)										
FC2100		(Plate making)										
FC2101		Film printer (imagesetter)	1	Plate making	Color separation & screen use				1			One unit planned as color separation and use of screens are essential. RIP software to be installed in the editing computer
FC2102		Film processor	1	Plate making	Developing films				1			One unit, for developing films
FC2103		PS plate printer	2	Plate making	Making PS plates from films				1			One unit for burning PS plates from films
FC2104		PS plate processor	1	Plate making	Developing PS plates				1			One unit planned, for developing PS plates. Adoption of a CTP system was considered for the processes from film developing to PS plate developing but was not selected as further development of the system is expected and it can only be used with electronic texts, hence is premature for present purposes.
FC2105		Assembly table	2	Plate making	Defect check, positioning of film & PS plates				1			1 Plan one unit to check that film has no scratches etc.
FC2106		Air conditioner	1	Plate making	Interior temperature control	x	x	x				1 Air conditioning not needed; eliminated
FC2200		(Printing)										
FC2201		Printing machine, full color	1	Printing	4-color printing machine				1			Machine for 2-color A2 printing to be provided as 2 colors will suffice for almost all materials, require less space and be suitable for printing materials of few to moderate page
FC2202		Printing machine, one color	2	Printing	One-color printing machine				1			1 Plan one unit for monochrome printing of A3 materials for pamphlets of limited page number
FC2203		Serigraph printer	1	Printing	Serigraph printing machine	x	x	x				1 Not needed; eliminated
FC2204		Packing equipment	1	Printing	Wrapping printed materials	x	x	x				1 Ditto
FC2205		Digital printer (A3)	1	Printing	Mimeograph-type "mini-printer"				1			One digital machine provided for use when urgent reproduction of teaching materials is needed
FC2206		Air conditioner	2	Printing	Interior temperature control	x	x	x				2 Air conditioning not needed; eliminated
FC3000		(Post printing)										
FC3001		Folding machine, big	1	Printing process	Folding sheets after printing				1			One folding machine is planned as manual folding requires considerable experience
FC3002		Folding machine, small	1	Printing process	Cutting paper after printing	x	x	x				1 The folding machine to be supplied can also handle small-scale jobs; eliminated
FC3003		Sheet collator	1	Printing process	Collating printed sheets	x	x	x				1 Mechanical collation of sheets for small-run printings is not necessary; eliminated
FC3004		Signature collator	1	Printing process	Collating folded sheets				1			Collates signatures (more efficient than collating individual pages)
FC3005		Cover maker machine	1	Printing process	Hard cover machine	x	x	x				1 Eliminated as being deemed unnecessary for retraining
FC3006		Thread sewing machine	1	Printing process	Sewing on spine after folding				1			One unit, as sewn bindings are needed for heavily used texts
FC3007		Wire sewing machine	1	Printing process	Stapling				1			Effective for binding of materials having relatively few pages.
FC3008		Gilding press	1	Printing process	Adding gilded lettering etc. to book	x	x	x				1 Not needed; eliminated
FC3009		Gilding press for labels	1	Printing process	Apply labels etc. to covers of books	x	x	x				1 Ditto
FC3010		Thermo binding machine	1	Printing process	Sewn-binding, hot-glue binding				1			One of the most widely used forms of binding
FC3011		3-knife cut machine for book blocks	1	Printing process	Trimming on 3 sides in final stage of bookbinding	x	x	x				1 Eliminated, as other equipment can do this as well
FC3012		1-knife cut machine for big sheets	1	Printing process	Cutting sheets				1			A sheet cutting machine is essential for printing activities; one unit is planned
FC3013		Cutter	1	Printing process	Cutting sheets	x	x	x				1 Eliminated as the sheet cutter will do the job of this equipment
FC3014		Air conditioner	1	Printing process	Interior temperature control	x	x	x				1 Air conditioning not needed; eliminated

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
FC4000		Special equipment)										
FC4001		Computer composition section	1	Printing process	Color inspection, enlarging, etc				1			Necessary for see qualities of proof or final printing
FC5000		(Additional equipment)			Small cart (2), tables, chairs, shelves							
FC5001		Peripheral equipment	1	Printing process	Humidifier & hygrometer etc.				1			Maintenance of suitable humidity is essential to ensure favorable finishing of printing; humidifier & hygrometer to be supplied
FD0000		11.3.13 Lab for retraining on information technology										
FD1000		(New IT lab)										
FD1001		Server computer	1	IT lab	Research & training in use of server				1			Use for study of input to server and readout from server. One server planned.
FD1002		Computer	15	IT lab	Research & training in IT				4			1) Plan one unit for network study, one for study of preparation of educational materials, one for image processing for education.
FD1003		Graphics-use computer	2	IT lab	Research & training in IT with emphasis on graphics techniques	x	x	x				2) Make use of FD1002
FD1004		UPS	30	IT lab	Computer power interruption safeguard				5			25) 5 units planned; essential for network systems
FD1005		(LAN equipment)		IT lab								
FD1006		Computer (notebook)	5	IT lab	Research & training in mobile computing				2			3) 2 units planned, for study of methods of connecting LANs, connecting to the Internet, and effective use of mobile computing.
FD1007		Scanner (A3)	1	IT lab	Input of drawings & photos to computer memory				1			One scanner to be provided for study of methods of its use.
FD1008		Plotter (A1, color)	1	IT lab	Research & training in use of the large scale plotter	x	x	x				1) Eliminated as plotter in Printing Room can be used when needed
FD1009		Laser printer (color)	1	IT lab	Printing of documents				1			One unit for printing research materials etc.
FD1010		CD printer	1	IT lab	CD label printer	x	x	x				1) Not needed; eliminated
FD1011		Copier (A3)	1	IT lab	Copying of materials	x	x	x				1) Ditto
FD1012		CD/R-W	2	IT lab	CD-ROM device				2			2) units planned for use with computers
FD1013		ZIP disk	100	IT lab	ZIP type disk	x	x	x				100) Eliminated as CDs and floppies are adequate
FD1014		ZIP driver	2	IT lab	ZIP driver	x	x	x				2) Ditto
FD1015		Floppy disks (3.5")	1000	IT lab	Floppy disks	x	x	x				1000) Eliminated – can be procured in Uzbekistan
FD1016		Multimedia projector	1	IT lab	Research & training in computer output				1			Plan one unit for study of effective display using large screens
FD1017		OHP (portable)	2	IT lab	Research & training in use of the OHP	x	x	x				2) Not needed; eliminated
FD1018		Video editor	2	IT lab	Research & training in use of the video editing machines							2) Eliminated as video editing can be done using computers
FD1019		Internet card	1	IT lab	Research & training in use of Internet connecting cards	x	x	x				1) Not needed; eliminated
FD1020		Liquid crystal panel	1	IT lab	Research & training in liquid crystal	x	x	x				1) Ditto
FD1021		Digitizer	1	IT lab	Research & training in the digitizer	x	x	x				1) Ditto
FD1022		Modem	2	IT lab	Use of a fax modem	x	x	x				2) Ditto
FD1023		OHP	1	IT lab	Research & training in use of OHP	x	x	x				1) Ditto
FD1024		Video conference system	13	IT lab	Video (TV) conference system	x	x	x				13) Ditto
FD1025		Video eye	1	IT lab	Display materials	x	x	x				1) Ditto
FD1026		TV video	1	IT lab	Preparation of video teaching materials				1			Plan one unit for validation of videos made for use as educational materials. Also use as sample of IT equipment
FD1027		Video camera	1	IT lab	Preparation of video teaching materials							1) Duplicated item; eliminated
FD1028		Digital VTR	1	IT lab	Research & training in principles & use of digital video				1			For study on uses of digital video, a rapidly-developing field. One unit. Also use as sample of IT equipment

No.	Sub No.	Designation of equipment	Reqd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
FD1029		Tape recorder	1	IT lab	Research & training in use of tape recorders				1			Plan unit for study of diverse uses as teaching medium or tool. Also use as sample of IT equipment
FD1030		Digital video recorder	1	IT lab	Research & training in digital video recorders				2			Use for study of technique for video recording of lectures etc. and visual (photographic, etc.) presentation of techniques. Also use as sample of IT equipment. Editing: done using computer
FD1031		Digital TV camera	1	IT lab	Research & training in principles & use of digital cameras				2			Use for study of technique for video recording of lectures etc. and visual (photographic, etc.) presentation of techniques. Also use as sample of IT equipment. Editing: done using computer
FD1032		Tuner	1	IT lab	TV-, broadcast-use educational	x	x	x				Included in TV item; eliminated
FD1033		CD/DVD player	1	IT lab	Broadcasting of lectures				1			Perform research on applying CD/DVD players for teaching; also use as sample of IT equipment
FD1034		Speaker	1	IT lab	Amplification of speech	x	x	x				Eliminated as not particularly necessary. Equipment in the Conference Hall can be used as a sample of this type of equipment
FD1035		Microphone	3	IT lab	Voice recording	x	x	x				Ditto
FD1036		Fax	1	IT lab	Communication between/with regional, other departments centers				1			One unit as a sample of IT equipment
FD1037		Liquid crystal board (portable)	3	IT lab	Show content of instruction	x	x	x				Not needed; eliminated
FD1038		Stand board	1	IT lab	Display of educational material	x	x	x				Ditto
FD1039		Air conditioner	2	IT lab	Interior temperature control	x	x	x				Ditto
FD2000		(Specialized class rooms)		IT lab								
FD2001		Server computer	2	Specialized class rooms	Storage of educational materials data, student assignments etc.				1			Storage of educational materials data, student assignments etc.
FD2002		Computer	30	Specialized class rooms	For use by students in their studies				13			13 planned; one per 2 persons in 25-person classes
FD2003		UPS	32	Specialized class rooms	Computer power interruption safeguard				14			12 planned; essential as network equipment
FD2004		Laser printer	2	Specialized class rooms	Printing of materials				1			Three units planned for shared use in 5 departments by moving them to the department where needed; one to be moved when needed to the Conference Hall
FD2005		Scanner (A4)	2	Specialized class rooms	Input of drawings & photos to computer memory			x				Eliminated as the IT faculty scanner can be used when it is necessary to teach the principles of the scanner
FD2006		Video conference system	32	Specialized class rooms	Video (TV) conference system	x	x	x				Three units planned for shared use in 5 departments by moving them to the department where needed; one to be moved when needed to the Conference Hall
FD2007		Multimedia projector	2	Specialized class rooms	Display teaching materials				1			One unit planned for computer output use
FD2008		OHP	2	Specialized class rooms	Display teaching materials				1			One unit for classes where OHP use is needed
FD2009		Video eye	2	Specialized class rooms	Display teaching materials				1			One unit planned for display of classroom conditions
FD2010		Blackboard	2	Specialized class rooms	Display teaching materials				1			One blackboard planned
FD2011		Stand board	2	Specialized class rooms	Display teaching materials				1			One unit, for display of teaching materials
FD2012		Air conditioner	2	Specialized class rooms	Interior temperature control	x	x	x				Air conditioning not needed; eliminated
FE0000		11.3.14 Software										
FE1000		(System software)										
FE1001		LINUX server	20	System software	LINUX server			x				Included in each computer server
FE1002		Windows server	40	System software	Windows server			x				Ditto
FE1003		Windows workstation	80	System software	Windows workstation			x				Ditto
FE1004		Inter Base	150	System software	Inter Base			x				Ditto

No.	Sub No.	Designation of equipment	Req'd Qty	Name of Course	Purpose of use	Necessity	Suitability	Evaluation	Planned Qty			Subject investigated
									A	B	C	
FE2000		(Application software)		System software	(Application software)							
FE2001		MS Office	1	System software	MS Office			x			1	Included in each computer server
FE2002		Graphics software	1	System software	Graphics software			x			1	Ditto
FE2003		Multimedia software	1	System software	Multimedia software			x			1	Ditto
FE2004		Internet browser	1	System software	Internet browser			x			1	Ditto
FE2005		Programming language software	1	System software	Programming language software			x			1	Ditto
R00000		11.4 Regional centers										
R00001		Computer	14	Regional centers	Contact with Faculty; preparation of educational material:	x	x	x			14	Eliminated: either existing equipment is to be used or Uzbekistan will make needed changes at its own expens
R00002		UPS	14	Regional centers	Computer power interruption safeguard	x	x	x			14	Ditto
R00003		Laser printer	14	Regional centers	Printing of materials	x	x	x			14	Ditto
R00004		Modem	14	Regional centers	Internet connection	x	x	x			14	Ditto

* Requested quantities as of end of December 2002.

* Categories of Equipment Plan components

A: Suitable & high in priority

B: Suitable, but less important than category A

C: Unsuitable & low in priority, hence eliminated

Details of the study outcome are as follows. They are presented on the basis of three headings: (1) equipment for professional education (17 teaching courses including common equipment), (2) computers and network equipment, and (3) printing machinery.

(1) Equipment for professional education

1) Metalwork

Instructor retraining for this course is to be implemented by the Nukus Polytechnic PC. The purpose of this course is for students to learn basic technique for machining metal and working with metal sheets. As is common for all courses, the advantage of doing retraining at professional colleges is that OJT is possible. It is therefore appropriate that the equipment in this project be selected with student educational training in mind. In general, Uzbekistan's professional colleges do not possess a large variety of metal processing equipment, and what they do have in many instances is old and difficult to operate. At this particular PC, there is no piece of equipment worthy of mention here.

Emphasis in this course is placed on the techniques of using conventional machine tools, but the curriculum also provides for educating students in use of new technology, specifically the operation of NC/CNC machine tools by use of a computer. Practical training in this course is provided in the turning (lathe) workshop, milling machine workshop, and metals workshop. This categorization is for convenience, in order to emphasize the location of equipment, while it is necessary to take all the workshops as a mutually related workshop for metal work. At the same time, equipment planning also uses these categories, with workshops comprising 25 persons per class, working in groups of eight or nine.

It is considered to be appropriate for the Equipment Plan to classify the requested equipment according to the following three headings.

- a) Equipment necessary for studying basic processing technology, where a certain number of hours of hands-on practice is needed, and groups of two or three persons per equipment item can be used, so that five or six pieces are needed.
- b) Equipment for learning operation by demonstration, but is not frequently used, so that one unit of the equipment will be adequate.
- c) Equipment to be used frequently and being relatively simple to operate, so that one or two units will be sufficient.

Turnery Workshop Equipment

Request was made primarily for ordinary lathes, bench lathes and CNC lathes, including vertical drilling machines, bench lathes, bench drilling machines, muffle furnace, and benches and chairs to go with them. Classifying the main pieces of equipment according to the above headings, they are:

- a) Standard lathes
- b) Muffle furnace, CNC lathes, vertical drilling machines, turret lathes
- c) Vertical drilling machines, bench drilling machines, bench grinding machines

A standard lathes in classification “a” is to be for use by two or three persons of a 9 person group. Therefore, the number of equipment provided is planned to be five, though ten units are requested.

Basically, one unit of each type of equipment in classification “b” is to be provided. Requested four units of CNC lathe was reduced to one as it is difficult to operate and maintain. The heat treatment muffle furnace requested was with an advanced-specification of 1,600 degrees C maximum temperature, therefore the grade to be provided is adequately adjusted for ordinary heat treatment, advantages of turret lathes have largely been eliminated by increased use of numerical control for machine tools, none are to be provided.

In the case of “c” the same number of pieces of equipment as requested is to be provided. One tool set for each person of a group will be provided.

Milling Workshop Equipment

For use in milling machine workshops, request was made for horizontal, vertical, and universal milling machines, CNC milling machines, vertical machining centers, vertical boring machines, surface and cylindrical grinding machines, cutter grinding machines, benches and chairs. The requested machinery is classified as follows.

- a) Vertical milling machines
- b) CNC milling machines, cylindrical grinding machines, cutter grinding machines, universal milling machines, horizontal milling machines, vertical machining centers, vertical boring machines, surface grinding machines
- c) Bench lathes

Results of study on the requested equipment, classified as above, are as follows.

Vertical milling machines are fundamental, important and the most common, therefore, five are to be provided.

In classification “b” the CNC milling machine, that requires programming and is not easily operated and maintained, is nevertheless requested by the industrial sector and included in the curriculum; one of these is to be provided. Surface and cylindrical grinding machine are essential for high-precision work for both heat-treated and non-heat-treated materials. Surface grinding machines, nevertheless, are less frequently used and are eliminated from the equipment list for the professional colleges. Cutter grinding machines are needed for the maintenance of various tools such as turning tools, drills and various types of cutter, but top-grade equipment is not necessary for PC workshop use, So, a handy machine such as a drill grinding machine has been planned.

Vertical boring machines are important machine tools that are essential for precise, large-diameter boring, and they require a high level of technique to operate. The operation frequency at the professional colleges is estimated to be low, and educational benefits too would be low, so this is not included in the Equipment Plan. In the case of vertical machining centers similarly high level maintenance skill would be necessary, but as an adequate maintenance system is not expected presently, this too has been excluded from the Equipment Plan.

As in the case of “a”, nine tool sets are to be provided, but chairs are to be excluded as not being essential.

Metal Workshop Equipment

Sheet metal working is primarily taught in workshops, and the kinds of equipment requested for retraining programs were shearing machines, high-speed cutters, band saws for cutting material, press brakes and pipe benders for bending metal, bench drilling machines, and vertical drilling machines bench grinding machines, workbenches and chairs. All of these belong to heading “c” above.

Among these, the shearing machines and press brake in particular are essential for study and practice of sheet metal work but one unit each is sufficient for one group. For this reason the Equipment Plan calls for one unit each as mentioned above. Metal processing training requires frequent use of bench grinding machines, so two units are to be provided despite one requested unit. Nine workbenches are to be provided, so that each person in a nine-person group can use his own workbench. Chairs are in low-priority items and are not provided for.

2) Welding Technology

The Nukus Polytechnic PC is to be in charge of this course as part of the instructor retraining. As this course is intended to train welders, the request was made, in particular, for acquisition of technology for general welding equipment employing technology with high practicality for actual work, as well as related technology. Consequently, the following equipment was requested for use in retraining for the welding technology course.

a) Welding equipment

AC arc welding, DC arc welding, AC/DC welding, TIG welding, MIG welding, CO₂ welding, acetylene welding, spot welding, submerge arc welding, and brazing kit with accessories

b) Gas cylinder

Oxygen gas, natural gas or butane cylinders

c) Set of acetylene welding equipment

Acetylene gas generating equipment, welding torch, cutting torch gas hose and hose clamp, lighter

d) Welding materials

Welding rods, welding wire and flux needed for the above equipment

e) Equipment for inspection

Magnetic defect detector, ultrasonic defect detector, Brinnell hardness tester, Rockwell hardness tester

f) Welding rod drier and flux drier

g) Others

Gas cylinder cart, CO₂ cylinder heater, plastic welding kits

Requests for welding equipment, as summarized above, was diversified. General welding work can be done using the equipment described above, as well as inspections, so that the requested equipment is in a balanced, combination. The welding equipment is suitably classified by nature as follows

1) Techniques that must be learned through experience, whereby each student has adequate opportunity to practice basic welding techniques

AC arc, acetylene gas, CO₂ gas arc, brazing (hard, soft)

2) Basic welding techniques that can be learned with relative ease

Spot welding

- 3) Special welding techniques that can be learned admittedly through acquisition of knowledge

TIG, MIG, submerge arc, DC arc welding

- 4) Welding inspection techniques

Welding defect inspection

In the case of “1)” above, sufficient actual practice is needed as these are basic welding techniques, so it would be suitable to divide each class of 25 persons into four groups (six or seven persons per group). The Equipment Plan calls for six units per group, so there will be almost one unit per person. The number of acetylene gas welding equipment sets was adjusted because of duplication in the request (more than one entry, using different designations).

For “2)” the plan calls for both the fixed type and the pedal type.

Regarding “3)” TIG and MIG welding require helium gas, and it would be difficult to maintain these equipment in good conditions at Uzbekistan’s professional colleges. Moreover, it is not necessary to give enough practical training on these techniques. Therefore, TIG and MIG equipment were not included in the Equipment Plan. Because DC arc welding is used for special situations and is not used very frequently, a single unit will suffice. Further, though AC /DC arc welding equipment is interchangeable and convenient, the educational effect is not expected significant so that this was excluded. Submerge arc welding, used for special steel, has declined in importance with the development of welding rods, and this type of equipment also has been left out of the plan.

Regarding the other equipment, a welding rod drier would be sufficient considering the capacity and the necessity. Welding rod and flux containers are not necessary if there is a drier, so these are not included. A plastic welding kit would not be used in the planned program and is excluded from the Equipment Plan. A suitable number of welding rods in each set is to be provided.

3) Pharmacy

The Urgench Medical PC will be in charge of the retraining of educators teaching pharmacy courses. Initially there was no request for equipment specifically for pharmacy related retraining but at the time of the second field survey a list of 18 items was additionally submitted. Almost all are for general use in chemistry

labs.

The curriculum for student education comprises lab courses in analytic chemistry, organic chemistry, inorganic chemistry, pharmacognosy, compounding medicines, and pharmacology. For all, the same basic types of equipment are used. Among the relatively large equipment are centrifuges, distillation apparatus, and bench autoclaves; a large number of ordinary mortars are also needed. All equipment is to be suitable for high-school level use.

It is assumed that there will be 25 persons in a retraining course. They are to be retrained in the use of analytic scales for chemical analysis, water baths, centrifuges, magnetic stirrers, electronic balances, pH meters, pressure, volume and temperature measurement apparatus, chemical test apparatus, and biological microscopes. For convenience in going through the actual processes of chemistry experiments, working in small groups, equipment is to be in numbers of three to ten. Thermometers, and mortar-and-pestle sets are to be provided, in the organic chemistry analysis sets, in sufficient number for each trainee to have one, with additional provision made for replacement due to wear in extensive use over time. Distillation apparatus is also called for the nursing program, and out of consideration for convenience in maintenance in the future, joint use of this in both programs is assumed, and equipment of suitable capacity is included in the Equipment Plan for nursing.

The models of the human body, for anatomical study, requested for the nursing course, is also to be used in the pharmacy course.

4) Nursing

The nursing retraining course will be given at the Urgench Medical PC. Initially, 84 items were requested in support of this course, and at the time of the second field study ten items were added, for trainers (simulators). All 94 items, classified, give 18 trainer items, 67 anatomical models, and nine items related to health care facilities.

The objective in using the equipment, as per the student curriculum, is as follows.

- a) The trainers (simulators) are to be used in “Therapy and Nursing 1, 2”, “Obstetrics, Gynecology and Nursing”, “Trauma Treatment” and other courses where actual nursing is to be simulated for the purpose of skill development.
- b) Anatomical models will be used to facilitate learning in “Fundamentals of Anatomy, Physiology and Pathology” as well as above-mentioned nursing and health care studies.

- c) Equipment for health care facilities will be used for “Clinical and Biological Analytic Techniques” as well as other course for learning the principles, composition and protection of facilities.

As a result of study of the requests, the following plan was developed.

Regarding “a” above, the variety of trainers (simulators) is high and some are for study of physicians’ techniques of examination. In general, medical or health care is broadly divided into examination and treatment, and physicians undertake examinations and develop or implement treatment that of ten involves advanced techniques, while nurses are engaged in relatively conventional treatment, and in giving assistance to doctors. On the basis of this understanding, the trainers for physician use were eliminated as not being suitable. The eliminated items are a cardiology patient simulator, a trainer for vagina examination, an eye examination trainer, a wearable breast examination model, and a suture practice trainer.

In “b” much duplication was found in the anatomical models in the initial list and some were specified in considerable detail, and the Uzbekistan officials voluntarily canceled such items. The study team agreed with this and the number of requested items was reduced by 43.

For “c” among the facilities-related equipment, the needles for spinal taps would be used only infrequently, and at the request of the Uzbekistan officials was dropped from the list.

In “d,” in addition, items that duplicated other equipment in function or were judged as being inappropriate were eliminated.

The Uzbekistan Ministry of Health has adopted as an important national strategy the improvement of first aid and emergency care techniques used at existing hospitals, namely, raising the number and level of medical facilities as well as the techniques used by physicians and nurses. In this context an electronic simulator, having advanced functions, would be effective in training in modern first aid, and supply of one unit is planned. The emergency care trainer was, however, dropped, in the grounds that it is not suitable as a model for emergency treatment as it has the intended purpose of training in stopping blood flow, setting broken bones, treating burns, and so on.

The retraining course would have 25 persons. Because the hemoglobin meter would probably be used in connection with many courses, two units are planned. Consideration was also given to the idea that it would be used in training by two groups practicing in turn. Among the trainers, the one for subcutaneous and intravenous

injection training would be used and reused many times, so it is thought that one unit per five persons is suitable and five are to be supplied. The ultraviolet light irradiator and sterilization cabinet would be used frequently, and two each are to be provided. The distillation apparatus requirement is to be provided by utilizing the one for pharmacy retraining.

Concerning the level of the equipment specifications, that used in nursing colleges in Japan was adopted. The opinions of Uzbek experts were heeded with regard to the anatomical models. Existing equipment for use in this retraining program is antiquated and in poor condition and would not be used at the projected retraining site, and therefore was not considered in making decisions on equipment plans.

5) Agronomy

The Namangan Agro-Economic PC is in charge of implementing the agronomy retraining. This course deals with instruction of cultivating a variety of crops in a scientific method. Equipment requested for this purpose was as follows.

a) Equipment for soil investigations

Soil compaction testing apparatus, soil augurs, soil color chart, soil moisture meter, soil thermometers, penetrometers, soil sieves

b) Equipment for studying crop growing conditions

Pot-soil heating apparatus, titration devices for chemical analysis of fruits and vegetables

c) General analysis and measuring equipment

Electronic balances, analytical balances, sulfate test strips, pH meters, salinity meter, current flow meters, spectrophotometers, chromatographs, colorimeter

d) Hydroponics equipment

Hydroponics complete analysis kit

e) General-use equipment

Biological microscopes, desiccator

This equipment was selected specifically based on the equipment list of the JBIC project for agricultural PC's. The equipment is for analyzing physical and chemical properties of soils, investigating influences of soil temperature on crop growth, analysis of fruits and vegetables, analysis of hydroponic solution, and general purposes. Consequently the request is of itself coherent and includes equipment necessary for broad-based crop

cultivation courses. The request was as stated because equipment for field crops is already existing fairly well.

It is planned that the equipment will be used by two groups of 12 or 13 persons for a class size of 25. If groups larger than this are formed it is needless to say that it will be beneficial in terms of quantitative use of the equipment. Six units for each are planned in order that one unit can be used by two or three persons, for biological microscopes, pot-soil heaters, soil thermometers, and desiccators.

The other equipment may be used by each group in turn, so one of each is planned. Special attention must be given to the actual use and maintenance of titration device for chemical analysis of fruits and vegetables, as a large number of reagents and chemicals must be used. However, one unit was included in the plan considering the importance for studying the effects of cultivation conditions on the growth of crops. The spectrophotometer is an instrument of relatively advanced nature but one is provided because it is valuable for basic chemical analyses.

6) Veterinary Medicine

Retraining for this course will be done by Namangan Agro-economic PC. The course is intended to train veterinarian's assistants, that is, to train students so that they can assist a vet in work. The following equipment was requested for this retraining course.

a) Sterilization equipment

Autoclaves, portable disinfection unit

b) Animal health care equipment

Electric massagers, magnetic probes, forceps for cutting hoofs, hoof inspection instruments

c) Medical equipment for examination of animals

Binocular microscopes, biological microscopes, feces analysis instrument sets, colposcopes, endoscopes, thermometers, manometers, tool set for measuring animal size, percussion hammers with pleximeters, nasopharynx probes, esophagus probes, metal detectors, milk quality test equipment, phlebotomy syringes, mastitis detectors, trichinosis detectors, large animal necrotomy tables, stetho-phonendoscopes, electrocardiographs, centrifuges, hot plates

d) Therapeutic equipment

Dissecting instrument sets, injection syringes, urinary tract catheters, milk catheters, surgical instrument sets, veterinary-obstetrical tool kits, aspirators, drug shooting pistol for animals large-animal surgical tables, small-animal surgical tables, trocars, syringe-injectors in sets

e) General-use equipment, measuring instruments and devices

Histological preparation sets, electronic balances, alcohol meters, cattle model for artificial insemination, cattle skeletons, models of animal organs and muscular system

f) Management equipment

Animal cages, instrument tables, instrument cabinets, water heaters, refrigerators, freezers

It is believed that a wide range of practical exercises would be possible with the above equipment. As in the case of the JBIC project, the equipment requested was determined through discussions by specialists. Veterinary assistants would not undertake surgery that is conventionally performed by a vet, but in the training of assistants it is necessary to impart adequate, diversified knowledge on the equipment used by the vets. Planning of the equipment to be provided was made in consideration of such differences between Uzbekistan and Japan.

Equipment planning was based on the assumption that one class of 25 persons will be divided into two groups of 12 or 13 persons. Because more training is required on the equipment among “a” to “e” above, such as binocular microscopes, feces examination sets, colposcopes, thermometers, manometers, alcohol meters, biological microscopes, trocars, and injection syringes, five of each of these are planned so that two or three persons in a group would use one unit together. As biological microscopes and thermometers it is planned to provide 13 units of both equipment so that one person in a group will have one of each. On the other equipment, acquisition of a high level of skill is not required, so it is reasonable to provide each group with one unit each except two units for stethoscopes.

As the animal cages would be frequently used, two are to be provided and one each of the other equipment in “f” above are to be provided.

7) Operation and Maintenance of Agricultural Machines and Equipment

The Asaka Agricultural PC will implement this course, where mechanics will be trained in the field of operation and maintenance of various types of agricultural equipment. The following equipment was requested for the retraining course.

a) Automotive (parts) models and trainers

Automobile structure models, diesel engine trainers, fuel system models, internal combustion engine cutaway models, fuel injection pump models, carburetor models, starter motor models, transmission models, clutch models, rear-wheel cut-away models

- b) Tractor (parts) models and trainers

Tractor structure model

- c) Four-wheel tractor and 3-wheel tractor

- d) Self-propelled cotton harvester

- e) Tractor attachments

Disc harrows, vegetable seeding machines, granular fertilizer spreaders, cultivators, chisel cultivators, speed sprayers, potato diggers, rotary mowers

- f) Machinery and equipment for maintenance and repair

Standard lathes, bench drill, arc welding equipment, acetylene gas welding equipment, spot welding equipment, soldering set, wheel balancing machine, stacker trucks, hydraulic jacks, compressors

- g) General tools and general-purpose equipment

Torque wrenches, distilling apparatus, diesel engine pressure gauges, tool sets, oil pumps, oil bucket pumps,

A variety of equipment was requested for maintenance and repair of agricultural equipment and motor vehicles. Some agricultural equipment and motor vehicles may have the same name but be different in structure, so that they are both important for educational purposes. At this PC there are some of old agricultural equipment and repairing equipment which are being used specially for student education. This was taken into consideration in developing the Equipment Plan as described below. Selection of equipment for an agricultural training course is necessarily reflected by the agricultural situation of the country in question. Among the above, “c,” “d,” and “e” which are for use in the fields, the cotton harvester, three-wheel tractor and the related implement are for cotton cultivation. As cotton is at present one of Uzbekistan’s major means of obtaining hard currency through international trade; the request with much emphasis on cotton cultivation is reflected by the background.

It is planned that a class of 25 persons will be divided into two groups of 12 or 13. This is because each group should use one tractor for the field training. One each of the models and trainers requested in “a” and “b” is to be provided for structure study, disassembly and re-assembly of automobiles and agricultural equipment. As for tractors in “c”, the four-wheel tractor is for general uses and the three-wheel one is for cotton, and both are used together with the related tractor implement, so one each is to be provided. The cotton harvester is a very large equipment, which would be used seasonally but would require an onerous maintenance service.

Considering this difficult maintenance work of the PC, it is not included in the equipment to be supplied. This had also been excluded from the JBIC project equipment likewise. Equipment in “e” is to be used separately by two groups and one unit each is to be provided. The speed sprayer would not be used frequently but the practice would be done in all seasons, so one unit is to be provided. As for maintenance equipment and tools in “f” and “g”, one unit each will be included in the Plan considering these functions.

8) Public Catering

The Kokand PC of Human Services will be in charge of the educator retraining for the take-out meals course. A total of 34 items were requested, but at the time of the second field study it was found that 13 were redundant, and these were eliminated to give a total of 21 items. They are broadly separated into bread making equipment, six items, and other food preparation equipment, for the rest. According to the student curriculum, the equipment is to be used for “Food preparation techniques, “Bread making,” and “Pastry making.”

“Bread making” requires use of machines or equipment for kneading dough, raising of dough, molders, reverse sheets, dividing and making roll dough machine, and bakery ovens. Other equipment is jointly used in all three courses.

Traditional Uzbekistan bread products have been joined by West European breads, which have rapidly spread in the domestic market. Making such breads with high efficiency while maintaining quality through mechanization is important in view of the expected market growth. Therefore it will be important for bakeries to acquire full sets of the required equipment and machines so that these new types of bread can be made to satisfy market demand. In recent years, moreover, the food service industry has expanded rapidly, and there is a tendency evident now for use of mechanized processing systems to be used to supply restaurants for production of take-home goods sold in shops or food service establishments. It is important, then, that professional education be modified if needed to comply with these market trends.

Steamers and friers would be much used, and used under for varying purposes, so two of each are planned.

There was much duplication because of the list of requests was not properly drawn up, and duplicated items were eliminated. It also is to be noted that there is almost no existing equipment in place that can be used for this program.

Equipment planning was done on the basis of selecting equipment meeting commercial standards, possessing the basic functions and low in capacity. All equipment for cooking or heating foods is to use

electricity.

9) Repair and Service of Radio Engineering and Tele-equipment

The training course in maintenance of wireless telecommunications equipment is to be given by the Kokand PC of Human Services. The maintenance and repair techniques to be acquired through this course are for radios, TVs, audio equipment, wireless communications equipment, and so on. Curriculum components are the fundamentals of electrical and electronic engineering; fundamentals of instrumentations engineering; fundamentals of wireless engineering; and fundamentals of electron tubes and TV; these are to be learned for purposes of repair and maintenance of equipment using wireless, electron tube, and TV technology. Equipment needed for this purpose is as follows.

- a) Equipment and devices for learning the basic circuits used for radio and TV
- b) Equipment for study of radios, TVs, videos, cassette recorders, etc.
- c) Equipment for hands-on training in repair methods

The equipment to be supplied will be for retraining of instructors who teach courses dealing with the above, and in view of the consideration that the instructors have hardly had any exposure to the equipment, and that learning the operation of the equipment and that OJT would be the main method for retraining, it would be suitable to select equipment as would be used in the student curriculum. The Equipment Plan therefore is as follows.

- a) Equipment and devices for learning the basic circuits used for radio and TV

Radio broadcasts are FM or AM, television broadcasts are FM (sound) and AM (picture signal). Class size would be 25 persons, and equipment is planned so that there is a unit for use of each group of two or three persons. Therefore for study of basic circuitry, it is planned to supply two operational amplifier practice units, two wireless transmission and reception units (FM, AM), one amplifier practice unit, and one power source circuit practice unit. Two digital pulse practice units are to be provided in view of the trend towards digital circuits. In order to make optimal learning accomplishments possible, the wireless transmission and reception equipment is to be provided in sufficient quantity that there is one for every two persons and for other equipment, one for every three persons. In order to make use of these practice units, peripheral equipment, particularly instruments and signal generators, are needed. The relation between the practice equipment and peripherals, and the number of persons using the equipment, is shown in Table 2-5.

TABLE 2-5 Relation of Trainers and Measuring Instruments (Basic Circuit)

Trainer Equipment	Electronic Amplifier (2 sets)	Wireless Transmission /Reception (2 sets)	Digital Pulse (2 sets)	Constant Current Amplifier (1 set)	Power Supply Circuit (1 set)
Oscilloscope	2	4	2	1	1
RF Signal Generator	-	4	-	-	-
LF Signal Generator	-	4	-	1	-
Frequency Counter	-	4	2	-	-
Function Generator	2	-	2	-	-
Voltmeter	2	4	2	1	1
No. of Trainee	6	8	6	3	3

b) Equipment for study of radios, TVs, videos, cassette recorders, etc.

The plan calls for two each of a TV circuit practice unit, a video circuit practice unit, and a CD cassette recorder-player practice unit. Classes would be 25 persons in size; these pieces of equipment are to be in such quantity that there is one for every four persons. Regarding radio and audio, it is believed sufficient that study use basic circuits and hence practice units specifically for radio and audio are not to be supplied. The relation between the practice equipment and peripherals, and the number of persons using the equipment, is shown in Table 2-6.

TABLE 2-6 Relation of Trainers and Measuring Instruments (Radio, TV, Video, etc.)

Trainer Equipment	TV Circuit Trainer (2 sets)	Video Circuit Trainer (2 sets)	Cassete/CD Trainer (2 sets)
Color Pattern Generator	2	-	-
Sweep Generator	2	-	-
(Oscilloscope)	2	2	2
(Voltmeter)	2	2	2
(RF Signal Generator)	2	2	-
(LF Signal Generator)	-	-	-
(Function Generator)	-	-	2
No. of Trainee	8	8	8 (or 9)

With the exception, of the color pattern generator and the sweep signal generator, peripherals to be used are to be those supplied in the heading “a,” i.e., equipment and devices for learning the basic circuits used for radio and TV. Because it is necessary to use real, functional audio equipment units in order to see the results of circuits created by the students, one each is to be provided of an amp, a speaker, a radio, a TV, a video camera, a cassette player, and a CD player. As joint-use equipment, one each is to be provided of the following: 1 GHz oscilloscope for measuring signals riding carrier waves, an LCR meter for measuring power consumption by audio equipment, a spectral multi meter for measurement of signals at each frequency, and a transistor tester for measuring functions of transistors.

c) Equipment for hands-on training in repair methods

Included in the hands-on training in repair are breakdown analysis (instrumentation), identification of the location of the breakdown, determination of the repair procedure, performance of repair (wiring, cable check test, soldering, selection of wire/cable to be used, selection of elements), and completion tests. The technology related to this includes parts processing and antenna fabrication. Therefore one tool set and tester per person are to be provided as basic tools and equipment, for a total of 25. In addition there will be supply of three input power transformers, five oscilloscopes for analytic and completion test uses, one signal generator and function signal generator for use in inspecting major breakdowns, two hand drills for making mounting holes and for processing work, two welders for antenna repair use, one bench lathe for making parts, and two workbenches.

10) Maintenance of Gas Supply Equipment

The retraining course for gas supply equipment maintenance will be given by the Bukhara Construction and Municipal PC. Twenty-three items were requested, but the list was reduced to 18 by elimination of redundancies. The learning objectives for which the equipment is to be used, according to the student curriculum, study of “Repair equipment for gas supply facilities,” and “Use and repair of gas supply equipment.” From the list, the item “flexible hose” was dropped as it would be little used. Because the PC does not possess this type of equipment at present, there is no duplication of existing equipment.

Classifying the equipment by broad category, we obtain tools used on site for pipe repair, and equipment needed for understanding the structure and principles that are basic to maintenance and repair of the subject equipment. The former comprise equipment or devices for threading pipe, bending pipe, cutting pipe, sawing, a pipe vise, and a chain hoist, while the latter comprise a pressure test apparatus, gas meters, flame propagation and stability experimental apparatus, Reynolds experimental apparatus, and resistant loss measuring apparatus.

The course is assumed to be for classes of 25 persons. With regard to construction type tools, those which would be frequently used will be provided on the basis of one per two persons, and other items will number one to four per person. Concerning test and measurement equipment, two each of the gas meter, home gas meter, and fuel combustion parameter measurement device, are to be supplied in order to augment learning effects.

The Reynolds experimental apparatus is somewhat advanced for student use but is included out of consideration of the objective, namely retraining instructors, as well as the expectation that this equipment will be of greater importance in the future in Uzbekistan.

Documents on the composition of gas available in Uzbekistan indicate that it is natural gas of which methane is 94%. This must be given attention as to whether it matches equipment specifications. Further, it is necessary to ensure that the dies used for thread cutting meet Uzbekistan standards for the relevant pipe.

11) Electrical Equipment Maintenance

Techniques to be learned through this course are electrical wiring work, lighting wiring work, power supply wiring installation, and assembly and repair of electrical equipment. The curriculum indicates that what is to be learned are the basics of electricity, including: electric wiring drawings, basics of electrical technology and automation technology; materials, measurement/instrumentation, electrical machinery, electric power supply, lighting, in addition to which hands-on experience is to be provided in electrical wiring equipment, lighting equipment, assembly of electrical facilities equipment and machinery, and assembly of electric appliances. The equipment required corresponding to this is as follows.

- a) Equipment for learning electrical facilities wiring and the functioning of electrical machinery
- b) Equipment for learning how to assemble electrical equipment
- c) Materials for learning how to do wiring
- d) Materials for learning the fundamentals of electrical technology

The equipment planned to be provided is for use by instructors in retraining courses. At present study by instructors is primarily done in the classroom and there has been almost no use of equipment such as mentioned above by the instructors. In view of this as well as the intention to provide retraining particularly through learning how to use equipment, and through OJT, it was deemed suitable to select equipment that matches the student curriculum. The types and quantities of equipment to be provided are given below.

- a) Equipment for learning electrical facilities wiring and the functioning of electrical machinery

The fundamental technological aspects to be learned with regard to electrical facilities are: generators, transformers, protection circuits, loads, motors and high voltage. Methods exist to present these aspects so that experiments can be performed in order to learn about them, but to prevent accidents such as caused by incorrect wiring when using 3-phase 380 volts and single-phase 220 volts, equipment specifically for learning purposes and incorporating adequate protection circuits is to be provided. The classes are to be 25 persons in size and the equipment provided will be in such number as to permit use by two or three persons at a time. The plan calls for supply of one motor test bench (3 types), three electric network test benches, two relay test benches, two load

test benches, and three transformer test benches. In particular, the wiring study apparatus is capable of permitting one student at a time to work. For these to be used for hands-on learning it is necessary to also provide peripheral equipment such as instruments, and load. The relation between the hands-on equipment and peripherals is shown in Table 2-7 below.

TABLE 2-7 Relation of Trainers and Measuring Instruments (Electric Network and Machinery)

Trainer Equipment	Motor Test Bench (1 set)	Electric Network Test Bench (3 sets)	Relay Test Bench (2 sets)	Load Test Bench (2 sets)	Transformer Test Bench (3 sets)	High Voltage Trans. Test Bench (1set)
Ampere/voltmeter	3	-	-	-	-	-
Tachometer	3	-	-	-	-	-
Load Rheostat	2	-	-	-	3	-
3-phase Load Rheostat	1	-	-	-	3	-
Wattmeter	3	-	-	2	3	-
Megger	-	3	2	-	-	-
Multimeter	-	6	2	-	-	-
Lux Meter	-	3	-	-	-	-
Earth Tester	-	-	2	-	-	-
Voltmeter	-	-	-	2	3	-
Power Factor Meter	-	-	-	2	3	-
Relay Tester	-	-	2	-	-	-
No. of Trainee	6	3	4	4	6	2
Technical Element	Generator, motor	Network load	Protective circuit	Load	Tranformer	High Voltage

b) Equipment for learning how to assemble electrical equipment

One unit per two persons for a total of 13 each is the scale of supply planned for motor assembly kits and (basic to electrical equipment) transformer assembly kits. Instruments will also be needed for checking the functions of assembled equipment. The relation between assembly kits and instruments is shown in Table 2-8. Note that in the case of instruments and so on with the exception of coil winders other equipment will be furnished as “Equipment for learning electrical facilities wiring and the functioning of electrical machinery” as noted above and this equipment will be used for study of assembly.

TABLE 2-8 Relation of Assembly Kits and Instruments

Kits Instrument	Transformer Kit (13 sets)	Motor Kit (13 sets)
(Voltmeter)	5	-
(Power Factor Meter)	5	-
(Megger)	5	-
(Tachometer)	-	5
Coil Winder	-	3

c) Materials for learning how to do wiring

It is planned to provide 13 sets of tools and equipment for hands-on wiring practice; the tools and equipment are relays, transformers, switches, lamps, fans, wire, and so on. Also, three hand drills are to be provided for use in experiments in changing voltage whereby variable transformers, relays, breakers etc. are to be installed.

d) Materials for learning the fundamentals of electrical technology

The Equipment Plan provides for supply, as basic equipment related to electrical technology, five solar cells, three electrolyzers, one instrument for demonstrating Lenz' Law, three condenser experiment devices, three Wheatstone bridge experiment devices, three thermometers, three oscilloscopes, and three resistors.

12) Technology for Preservation of Agricultural Products

It is the Beshkent PC that will conduct the retraining program for instructors in farm produce preservation courses. Fourteen items were requested. All relate to canning or bottling fruit, vegetables and other farm products. There is almost no equipment in place at present and hence no duplication of existing equipment.

Practice in actual work of canning and bottling is the specific subject of study in "Farm product processing machinery" that this equipment is to be used for. The process of canning (or bottling) consists of washing the produce, inspection, cooking/preparation, concentration/mixing, can (jar) washing, filling, sterilization, sealing (closure). Because the scale and learning effects of the automatic can washing equipment would not be suitable it was dropped.

Whereas it is expected that a wide variety of foods and food products would be canned, the equipment to be provided, if used properly, can accommodate a wide variety.

There will be 25 persons in the retraining class. Among the equipment, as the autoclaves and kneaders would be frequently used, and used for diverse purposes, two each are to be supplied.

13) Zootechnics

The Beshkent Agricultural PC will be in charge of the retraining for this course. In this course both veterinary medicine and livestock farming, mainly for the purpose of training persons for livestock raisers. The requested equipment for the retraining course is as follows.

- a) Sterilization equipment
Autoclaves, portable disinfection units
- b) Equipment for livestock health care
Electric massagers, magnetic probes, forceps for cutting hoofs, hoof examination instruments, pregnancy calendars for animals
- c) Equipment for livestock health examinations
Biological microscopes, feces examination sets, tool set for measuring animal size, vaginal inspection mirrors, thermometers, manometers, electronic balances, nasopharynx probes, metal detectors, milk quality test equipment, phlebotomy syringes, mastitis detectors, trichinosis detectors, large animal necrotomy tables, stetho-phonendoscopes, centrifuges, electric oven with time switches
- d) Therapeutic equipment
Surgical instrument sets, injection syringes, urinary tract catheters, milk duct catheters, surgical instrument sets, veterinary-obstetrical tool kits, aspirators, drug shooting pistol for animals large-animal surgical tables, small-animal surgical tables, trocars, syringe-injectors in sets
- e) General-use equipment, measuring instruments and devices
Histological preparations sets, electronic balances, alcohol meters, cattle model for artificial insemination, model cattle skeletons, models of animal organs and muscular system, anemometers, gas analysis meters, hygrometers
- f) Management equipment
Animal cages, instrument tables, instrument shelves, water heaters with thermostats, refrigerators, freezers, drying chambers, goggles
- g) Livestock farming equipment
Ear piercing, branding, tattoo equipment sets, nasal forceps, parturition loops, water baths, incubators, feed mixers, infrared and ultraviolet lamps, milking machines, wool cutters/shearing devices in sets with grinders, shedding units for horses, big-horn animals, pigs and dogs, automatic watering equipment

The Zootechnics course is related both to the veterinary medicine and livestock courses. All the above equipment is mainly “a” to “f” veterinary medicine equipment, added by “g” equipment for general care of animals, and the general measuring equipment such as anemometers, gas analysis meters, management-use

equipment such as drying chambers and goggles, and therapeutic equipment such as syringes and catheters. All of these are considered essential for learning about the raising and care of animals.

The plan for equipment for the veterinary medicine course is as described above. Equipment for the livestock farming course is planned to be used by two groups, each of which may use one unit each. Therefore, one unit each was planned for the course. The wool cutters and shearing devices, however, will be used during a short harvest season, and intensively. Therefore, 13 sets are provided so that one unit will be used by one person.

14) Joiner's Carpentry and Parquet Works

The Urgut PC of Construction and National Handicraft is in charge of the instructor retraining for the joiner's carpentry and parquet works course. Specifically, this course deals with wood products for architectural use, including lumber for flooring, doors and frames, as well as products such as tables, turned table or furniture legs, vases and so on. It is concerned with training in producing and finishing wood products, and flooring installation technique.

Specialized subjects for which this course provides classroom work are “Flooring techniques” and “Parquet,” while hands-on training is done for “Woodworking” and “Glass and parquet.” The equipment needed for these is:

- Equipment for cutting wood to predetermined dimensions and shapes
- Equipment that shaves or cuts wood to predetermined thickness
- Equipment that makes wood surfaces smooth
- Equipment for making mortises and tenons
- Equipment that processes wood to form round-section forms and do decorative carving
- Equipment for applying surface finishes to complete woodwork production
- Equipment for sharpening wood cutting tools
- Tools for basic tasks of manual processing of wood

These are necessary for retraining of instructors for hands-on courses. The equipment is grouped according to being electrically powered or manual, as follows.

a) Power tools and equipment

The basic tasks in woodworking are “cutting,” “surfacing,” “planeing,” “grinding and polishing,” and “painting.” The power tools and equipment needed for these tasks are shown in Table 2-9.

TABLE 2-9 Relation of Tasks and Power Tools

Task	Power Tool
Cutting	Circular saw (portable/fixed), radial saw
Surfacing	Thickness planer, jointer (portable/fixed), floor sander, floor cutter, floor polisher
Tenon Cutting/Mortising	Tenon cutting machine, mortising machine
Chanfering	Router machine
Turning	Wood lathe
Grinding & Polishing	Belt sander
Painting	Spray gun with compressor, lacquer sprayer
Others	Saw sharpening machine, pedestal grinder

These items of equipment are needed for practical training in achieving required dimensions of wood, in making wood round, in making holes and finishing surfaces, as well as grinding and polishing, and applying coats of paint or varnish etc., of or to wooden flooring materials, doors, window frames, vases, and other products made of wood. Application of surface finishes is done by use of a spray gun and compressor, or lacquer sprayer. Tool grinders and two-headed grinders are used to keep an edge of cutting tools such as saws and planes. For smoothing surfaces, finishing work, or cleaning and polishing of surfaces, floor sanders, flooring cutters, and floor polishers are used.

b) Hand tools

Manual work is basic to working in wood, and ability to use hand tools and understand how they function is of value in learning how to do mechanical processing using power tools. Among the equipment requested in the hand tools category are carpenter’s tool kits, saws, chisels, planes for rough work, and plans for finishing work. These are needed for the course. In addition, replacement blades for circular saws are needed.

The requested equipment is about the same as that used in vocational schools in Japan. Twelve sets were requested, with the exception of carpenter tool kits. Hand tools will be much used and since the class in the retraining program is to have 25 persons, 13 sets, or one for every two persons, are to be provided. As requested, one set of carpenter tools will also be provided.

The Urgut PC now possesses virtually no equipment suitable for instructor retraining for the architectural finishing and woodworking course. There are two small lathes for student use, two circular saws, a workbench

with vise, and hand tools (mostly drills and planes). Therefore, all of the equipment was given a priority rating of A.

15) Food Processing (Bread, Sweets, Macaroni)

The course in food processing is to be given by the Tashkent Technologic PC named after Mirza Ulugbek. A total of 49 items was requested. The equipment is for making bread, macaroni, cookies, waffles (wafers), tortes (cake), caramel and candy. However, at the time of the second field study, the Uzbekistan experts stated that the caramel and candy equipment was of low priority to them and requested that the related items be dropped, and they were then crossed off the list.

The practical training using the equipment, according to the student curriculum, is under the heading “Production equipment” or “Production techniques” in bread making, macaroni making, and pastry making. At present, in addition to the traditional bread products of the country, West European style bread is rapidly penetrating the market particularly in larger cities. Education in the new production techniques for these breads therefore is important to professional education institutions.

Bread making equipment can be classified according to the process, that is, dough kneading, rising, molding, rolling and spreading, shaping, and baking. A full set of the equipment for this will enable mechanized baking of West European style bread and pastries.

The equipment used in practical training for macaroni making is a machine for kneading dough, a macaroni extruder and formation machine, and a drier.

Hands-on pastry making training is for making cookies, waffles (wafers), and tortes (cake), using biscuit and cream blenders, cookie cutters, and a cookie oven in the case of cookies, flour and sugar sifters, waffle makers, wafer cutters, emulsion mixers and paste coating machine in the case of waffles (wafers). For tortes (cake), flour and sugar sifters, high-viscosity mixers, and eclair formers are needed.

The only equipment jointly used for making the bakery products above is a grinding mill for recovery product.

Kneading dough is of special importance in making bread. Two mixers are to be provided, enabling two groups to practice this at a time.

The level of mechanical specifications ensures that the basic functions that are standard in the baking

industry are provided but the capacity levels were set low. All equipment requiring power is to be electrically operated.

This PC now has bread-making capacity on the order of 2 tons/day. The equipment is not usable for hands-on training, so that other equipment is called for.

16) Maintenance of Food Product Processing Equipment

The Tashkent Technologic PC will undertake the retraining for instructors of food processing equipment maintenance courses. Eighteen items were requested. Of them those for hands-on training, as per the student curriculum, are “Flour milling equipment” and “ Maintenance and repair of production equipment.” In keeping with the objectives of the course, practical instruction is provided by operating equipment, and by disassembly and reassembly of equipment. Although the PC possesses several flour milling machines, movable parts have been removed and they are not working.

The requested equipment constitutes what can be called nearly a full set of equipment for the series of processes of making flour. If this equipment is listed according to the process for which each piece is used we obtain the following (in actual production, mills may repeat some processes or follow a different sequence).

<Pre-processing>			
Air separator	Vibration separator	Disk cleaner for grain	Magnetic separator
<Crushing >			
Bucker (crusher)	Roller mill		
<Milling>			
Wet grain pilling machine	Polishing machine for grain	Threshing machine	Peeler machine
<General-use equipment; other equipment>			
Grain flow meter, dosing mechanism for grain, mixer for fodder			

These pieces of equipment are for processing the grain itself, and are arranged vertically in mills, with conveyance equipment linking each process or piece of equipment. This is no required in a school, however, where they can be on the floor in sequence, greatly eliminating conveyance requirements.

In general, selection of equipment for instructional use is difficult because the scale of grain processing is large. Yet, the request was for equipment almost as large as is used in Uzbekistan. While this was taken into

consideration, low-capacity equipment was selected as it has the required general functions and will be effective for purposes of learning and instruction.

Each piece of equipment nevertheless is large and costly, making it desirable to eliminate equipment whose function is performed by other pieces. In accordance with this, three items, the disk cleaner for grain, the disk cleaner for grain separating wild oats, and the sieving machine for wheat, were eliminated. It is believed that the other equipment, to be supplied, is adequate for learning maintenance work. Further, the requested model of a miniature mill system would be a special-order item and would not be effective in facilitating learning, and hence was eliminated.

All equipment is made for actual use in producing flour, but is of low capacity.

17) Common-Use Equipment

At the pilot professional colleges for retraining, maximal use of OHPs and video projectors in retraining is intended, according to indications of the CSSVE. Because pedagogical methods and training techniques will be disseminated from these pilot schools to other professional colleges, one each of a video camera and educational materials production system will be supplied to each professional college. The video camera will be a consumer-grade product that does not have to be operated by a technician, and the editing function is provided as part of the production system. If these are equipped at the pilot professional colleges, they will make it possible to anticipate consequent improvements in instruction at other professional colleges as well.

The CSSVE made a strong request for supply of buses for transporting instructors for their retraining. In regional locations of the country the public transport system does not provide convenient service, and when instructors travel as a group they are obliged to hire taxis. For this reason the instructors often do not travel in groups and as there is uncertainty over their ability to arrive at a destination at a prescribed time, training program effectiveness is endangered. Moreover, they must negotiate fares, that tend to be high, comprising a deterrent to going for training. According to the transport plan prepared by the professional colleges for future retraining of instructors, with a variance among the regions, the annual transport demand comes to 20,000 to 70,000 kilometers. It is judged that it is impractical to accomplish this by using existing forms of available transportation. Moreover, it is evident that visits to factories and sites that instructors would not normally see is indispensable for improving the level of their technical knowledge while at the same time the factories or other establishments that might welcome such visitors certainly prefer that they visit in groups rather than straggle in one at a time. The value of such factory visits is such that the retraining program provides for them. Depending on the location of the PC the travel distance to such places will necessarily vary but in any number of instances

the distance will be substantial and the frequency of such trips will be high. Considering that it is difficult to rent vehicles for such purposes, it is necessary for the professional colleges to operate their own buses. Because of this, with a standard class being made up of 25 persons, plus staff members who would accompany them, buses with the capacity of about 28 persons are planned.

(2) Computers and Network Equipment

Uzbekistan has a plan for building a computer network that will link CSSVE, IDSSVE and all regional centers. All these are directly and indirectly related in regard to the retraining, and a computer system is desired for the specific purpose of implementing instructor retraining. The requested equipment can be grouped according to location, namely at CSSVE, IDSSVE headquarters, IDSSVE Retraining Faculty, and the regional centers.

a) CSSVE

Installation of a server-supported computer for the CSSVE is requested for purposes of management of human resource allocation for retraining, preparation of retraining program plans etc., and administrative communications related to approvals. Installation of a server would enable the existing computers at CSSVE to effectively form a network, but because there would be technical constraints to forming such a network using the existing computers, and because it is possible to accomplish these tasks by other means, this item is not provided for.

b) IDSSVE headquarters

Equipment requested comprises items for formation of an internet with outside networks, and items for formation of an intranet within the Faculty members. Relevant work at the headquarters includes drafting the guidelines for retraining; monitoring the retraining; examining and approving textbooks; providing guidance on methods of educating, and so on. It will be necessary to maintain close communications with the Faculty members (retrainers) when the retraining guidelines are prepared, and the department is several kilometers from headquarters, but it is thought that internal communications can be managed adequately without a special network. And whereas it will be necessary for there to be close contact with personnel who do the planning and writing of texts, this is considered to be low in priority. The actual use of a network system could be of use in retraining, but inasmuch as the Faculty has requested the same sort of system, and a combined internet-intranet system would be somewhat sophisticated, it was eliminated on the basis of the conclusion that it was not realistic to use if for retraining of teachers of secondary-level students.

c) IDSSVE (Faculty of Retraining)

The Faculty of Retraining request is for a network system. The composition of this is complex and described below. In the faculty, the major tasks are the retraining of managers of regional centers and professional colleges; production of educational materials in the IT field; management of educational materials; printing of educational materials (texts); utilization of IT for preparation of educational materials; retraining of IT personnel, and so on. Study of the request has been made with three points in mind, namely use for retraining activities, use for preparation of educational materials, and pedagogical methods using IT. The system is to be usable by both those being retrained and education-related IT specialists as to how it is to be maintained.

Server Section

The Server Section would handle overall management of the retraining-related network and possess a server computer for network management use. This would be where system performance, software, and network operation would be managed. Plans call for one each of a firewall/DNS server, a proxy/mail server, web design and network control computer.

Linux might be adopted to control costs for system version upgrades. Freeware such as apache, bind, ipfwadm, tcpwrapper, squid, sendmail, qpopper and so on would be used for writing the internet software needed. Each server would be equipped with network management tools and system management tools. As software for the web design and network control computer, Windows would be used as the operating system, with Office programs. Samba would be used for file swapping between Linux and Windows. The Server Section system configuration would be as in FIG. 2-1.

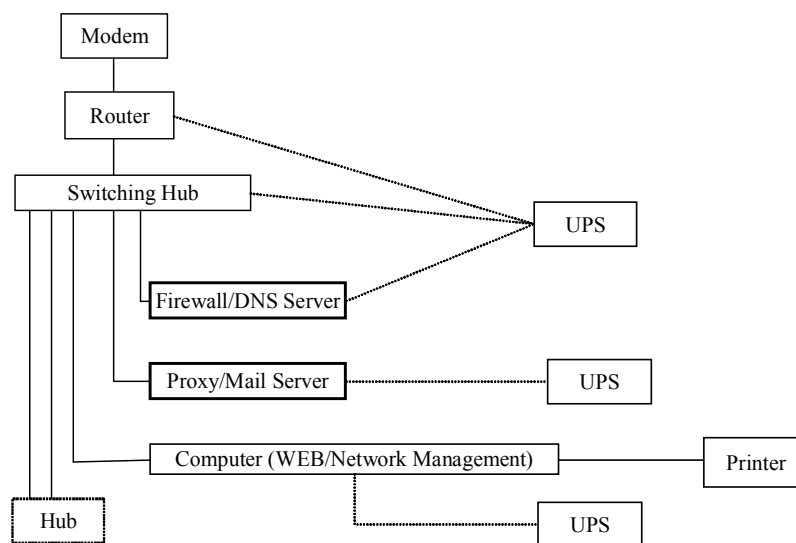


FIG 2-1 System Configuration – Server Section

Administration Office

A computer will be needed to control the conditions of use of the granted equipment, their locations, the identities of the persons responsible for the equipment, and so forth. Since control will be dispersed to each department, a central control computer item was removed from the list.

The Five Departments (Information Technology, Professional Education, Educational Psychology, Economics & Management; General Subjects)

The basic issue regarding Information Technology is that the use of computers would be particularly effective and the need for educational materials that make use of computers is very high. This is because of a language issue, as this field is in a transition stage in that it is being shifted out of Russian into Uzbek, and out of Cyrillic letters into Latin letters, but at least for some further time both will be in use. Because there are 13 instructors, provision of two computers and one laser printer has been planned. Concerning the other departments (Professional Education, Educational Psychology, Economics & Management; General Subjects) as well there is need for computers and one computer and one laser printer are to be provided to each department. The system configuration for Information Technology is shown in FIG. 2-2 below. Those of the other departments are shown in FIG. 2-3.

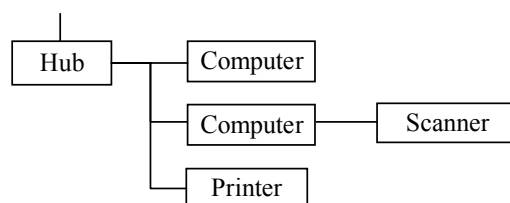


FIG 2-2 System Configuration – IT Dept.

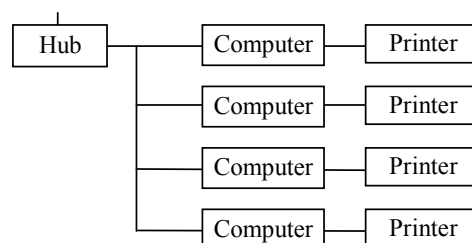


FIG 2-3 System Configuration – Other Depts.

Lecture Rooms (Five)

There is a classroom for retraining of administrative employees (from regional centers and professional colleges; one for each of the five subject areas), and to ensure a high level of educational effects, for each of the five rooms three projectors, OHPs, video eyes and stand boards are to be supplied, in addition to one blackboard for each. Computer software will be Windows and Office. The equipment configuration for these classrooms is as shown in FIG. 2-4.

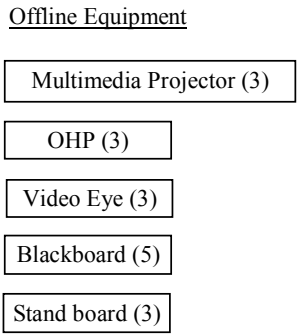


FIG 2-4 Equipment Configuration – Lecture Rooms

Conference Hall

In view of the relatively large Conference Hall (150-student capacity), an audio system is needed. The equipment configuration of the Conference Hall is shown in FIG. 2-5.

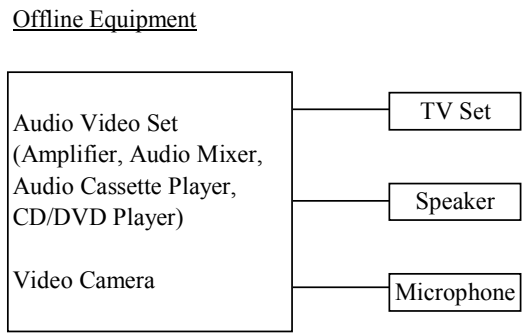


FIG 2-5 Equipment Configuration – Conference Hall

Digitized Library

The request made was for creation of a textbook database (DB), and database creation using CDs and

other media. Availability of a database will facilitate the use of data by regional professional colleges, and also be effective in retraining activities. The initial plan based on the understanding that it is necessary to include in the database all of the textbooks and educational materials used for secondary-level professional education.

- * Textbook DB creation: Title, subject, contents, number of pages, year published/revise, author
- * Video and CD DB: Title, subject, content, running time, year published/revise, author
- * E-texts DB: Title, subject, contents, number of pages, year published/revise, author

The equipment needed for facilitation of data search are one server and one computer for data input and searching. Windows Office is the software selected for the computer. In addition a copying machine, TV and video set, video camera, projector, blackboard, and display stand board (one each) are to be supplied. The system configuration of the library is shown in FIG. 2-6.

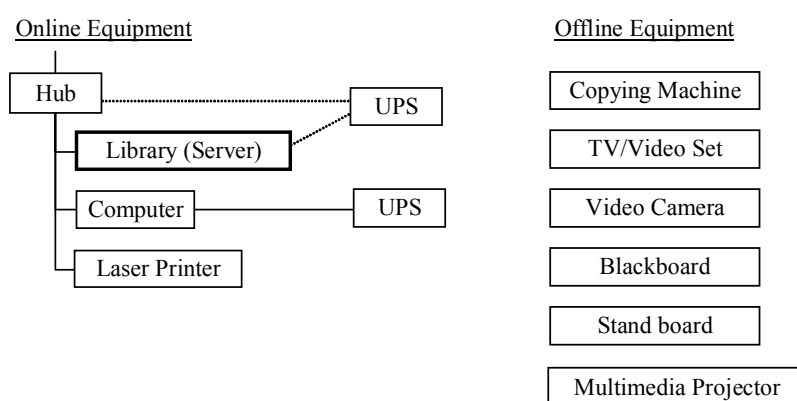


FIG 2-6 System Configuration – Library

Printing Room and Mini Printing Room

See (3) below.

Information Technology Laboratory

It is indispensable for there to be study of network systems as equipment for research and study on the methods and practice of using IT-based equipment in education. The network to be built will comprise a server computer, a computer for development of software for educational materials, a computer for study

of the creation of educational materials, and a computer for image processing. Peripheral equipment will comprise a scanner and a laser printer. One computer is planned for study on the utilization of notebook professional colleges. Software provided will be two sets each of Windows Office, as well as two sets each of Draw, Photo Retouch and PDF. In addition, one each of the following are to be provided as IT equipment deemed necessary: projector, TV/video set, digital video player, CD/DVD player, and fax machine, as well as two digital video cameras and two digital cameras. Video and photo editing would be done on one of the computers and an additional, dedicated computer is not required. System configuration is shown in FIG. 2-7.

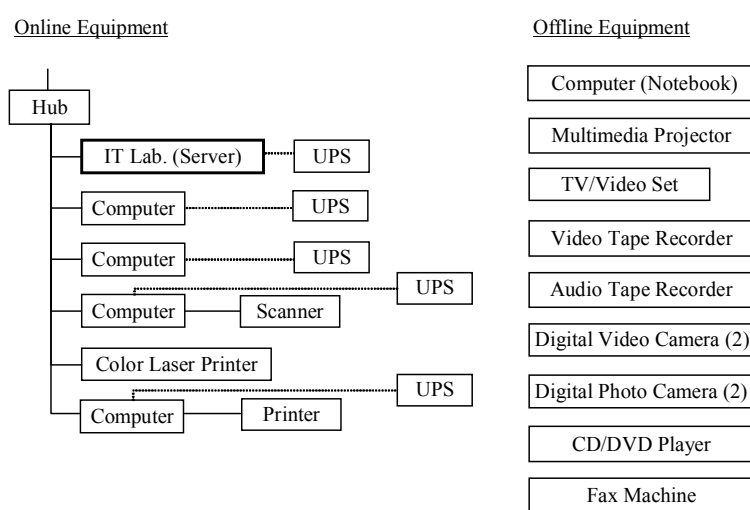


FIG 2-7 System Configuration – IT Laboratory

Information Technology Classrooms (2)

The initial request was for 30 computers and other equipment for the IT Classrooms, but inasmuch as the retraining classes will be 25 persons in scale each class will be provided with 13 computers, for a ratio of 2:1. For use in the classrooms, in addition, one each will be provided of a projector, OHP, video eye (camera), blackboard, and display board. System configuration is shown in FIG. 2-8.

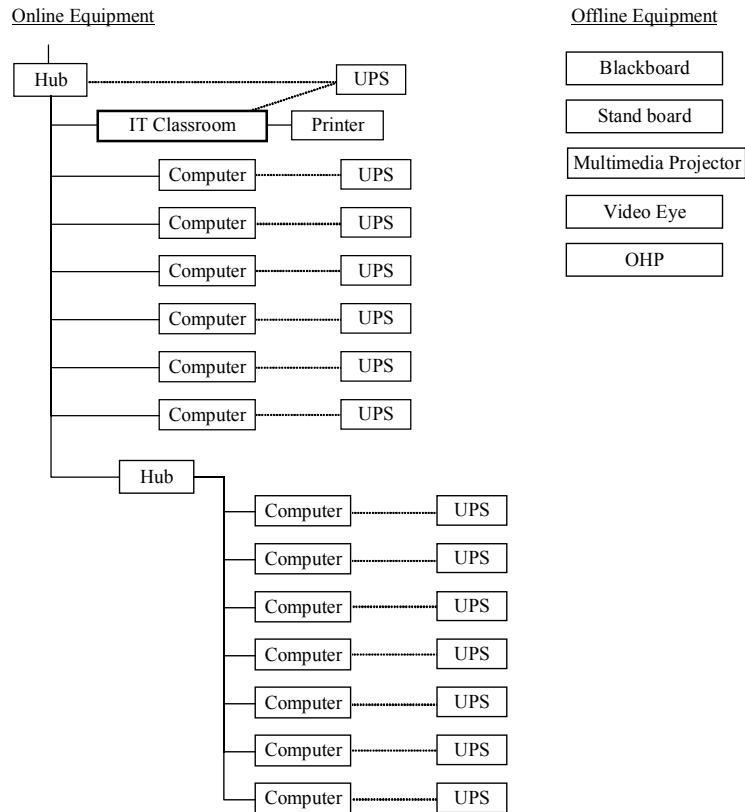


FIG 2-8 System Configuration – IT Classroom

d) Regional Centers

At the outset education in IT was planned to be given at CSSVE regional centers, but this is not considered realistic as the supporting environment is not adequate for this, and the request was not accepted. Telecommunications related to CSSVE and IDSSVE retraining activities are assumed to be by use of existing computers.

The overall network system containing equipment supplied by this project (including printing-related equipment) is shown in FIG. 2-9 on the following page.

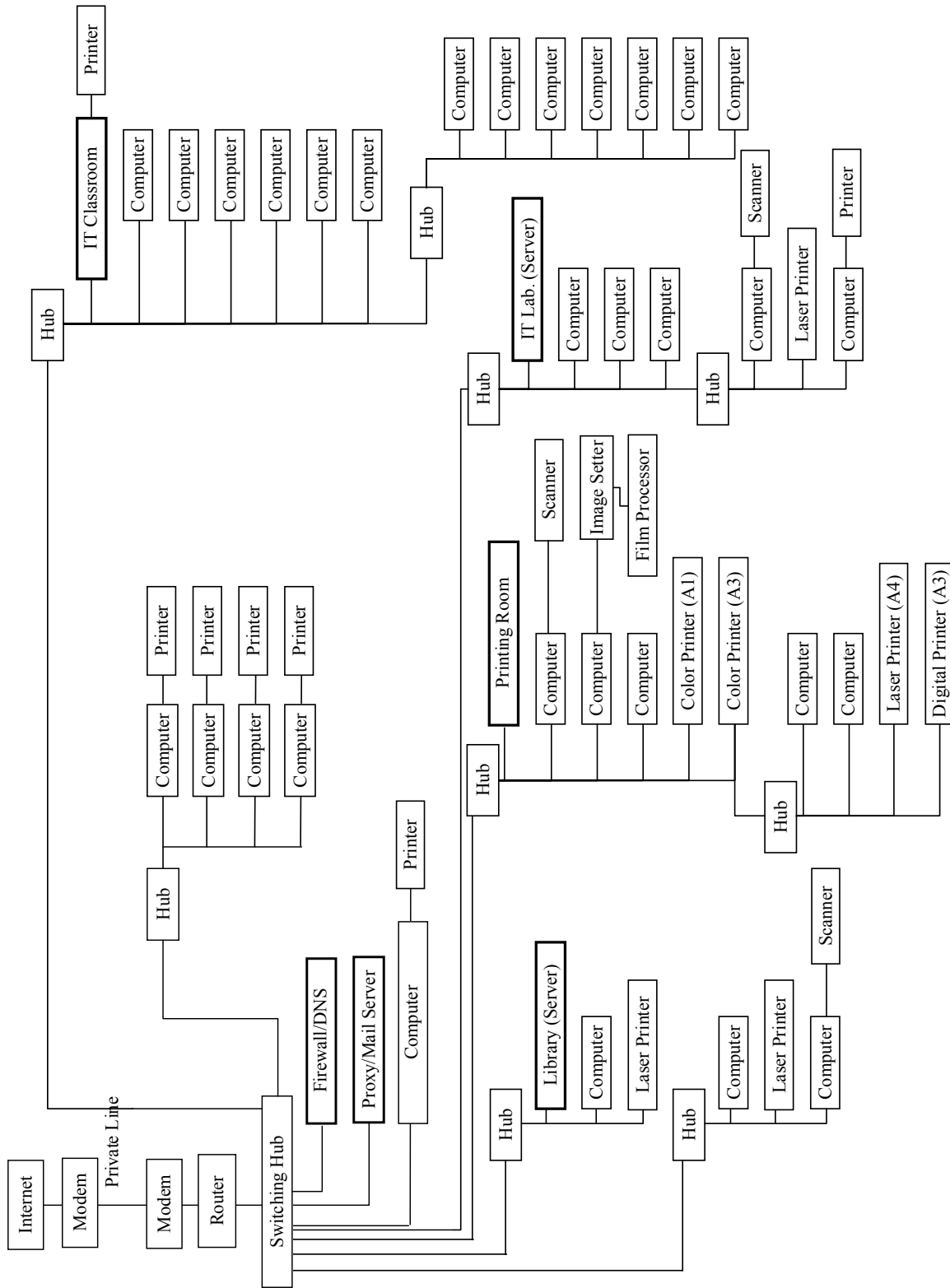


FIG 2-9 Overall Network System

(3) Printing Machinery

CSSVE's printing plans call for preparation of textbooks for student use, textbooks for instructors' use, textbooks for retraining use, and other publications (periodical publications of the Retraining Faculty, materials for professional education, pedagogical materials for professional education use, materials for off-site lectures, etc.). A plan has been made in this project for only the retraining materials, and the process for that has been determined as starting with manuscript preparation and editing, and continuing to pre-press preparation, printing, and binding (4 steps). The maximum size sheet for printing is taken as A2 in view of the planned location of the printing machinery, press runs, number of pages per printed item, and so on, while the most common form of printing, offset printing, is selected. Requested items for the Mini-printing Room should be studied in conjunction with those of the Printing Room as there is no apparent need for separation of the two, and for ease of maintenance work. Therefore other than a copying machine, items of equipment for Mini-printing Room were eliminated.

a) Manuscript preparation and editing

Manuscript preparation and editing will be done by use of the computer systems as both handwritten materials and electronically-prepared materials will be used as input. The hardware for the manuscript preparation and editing computer system will be made up of a server for permanent document storage and five computers for preparation and editing, one A2 scanners for photographs and drawings, one A1 manuscript test-printing-use color printer and one each of color laser printers taking A4 and A3 paper. Five sets of Windows Office software, and three of Draw, Photo Retouch, Layout and PDF are additionally to be provided as well as six UPS as power-failure precaution equipment and two network connectors.

b) Pre-press preparation

Digital/analog plate-making equipment, for which the operational technology has been well established, is to be used. Screen-making in the system is to be by use of a raster image processor (RIP) to make the films, after which PS plates are made. RIP software would be installed in the computer used for manuscript preparation, and one image setter and one film processor are planned. In the PS plate-making process use would be made of a PS plate printer and a PS plate processor; one each is to be provided. In addition, one assembler will be provided for checking films and editing PS plates.

c) Printing

The initial request was for one A1 full-color printing press, two A3 monochrome printing presses, two A3 digital printing presses and one serigraph printing pres. But in view of the limited number of educational

materials to be printed for retraining, and the present state of textbooks, two-color printing is judged to be adequate, so one A2 two-color press as well as one A3 monochrome press for reports and supplementary materials, one A3 digital press for short-run printing of instructor-use materials, and one A3 copy machine for spot reproduction of materials not processed electronically, are to be provided.

d) Binding

Equipment plans are for one each of the following for binding work: folding machine, collating machine, thread sewing machine, wire sewing machine, thermo biding machine, and sheet cutter. Requested items that will not be provided, because of low levels of use, are: a small-size folding machine, sheet collator, embossing machine, labeling machine. As the cutting machine can do the work of a three-sided cutter, the latter, that had been requested, will not be provided. Also dropped from the request list was a hardboard cover making machine as this is not needed for retraining materials. System configuration of the printing room is shown in FIG. 2-10.

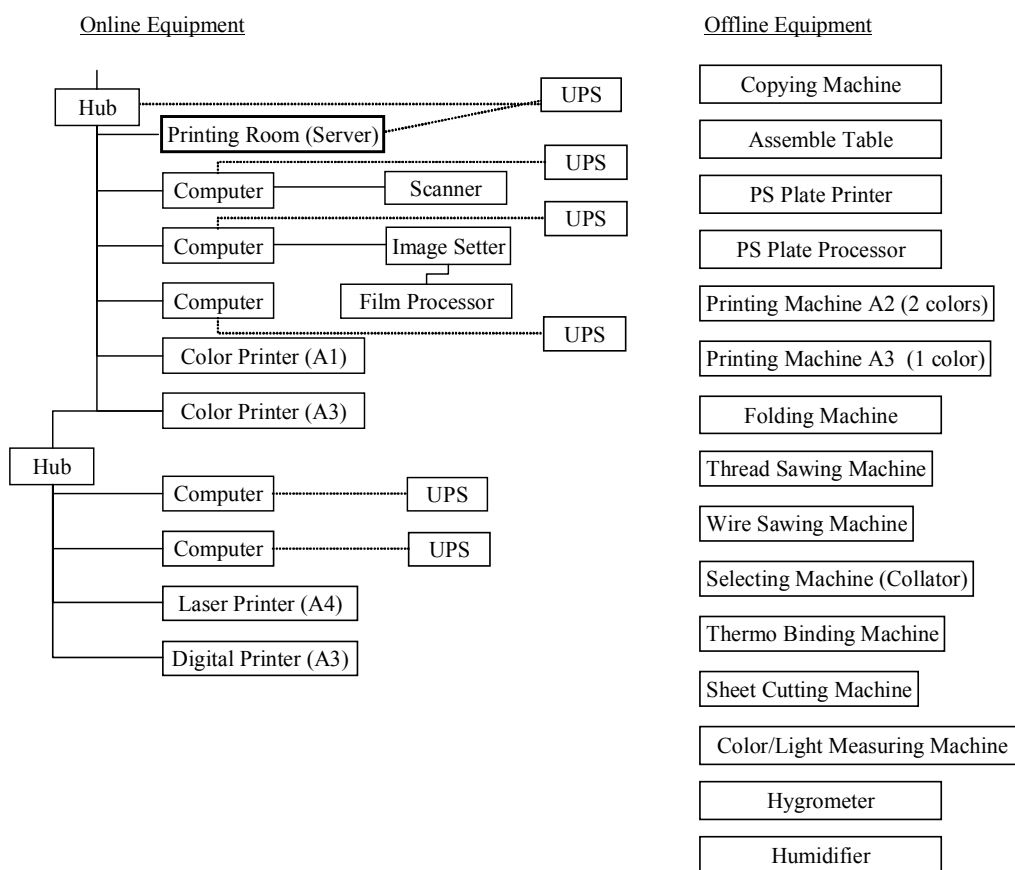


FIG 2-10 System Configuration – Printing Dept.

The major equipment items that have been considered as above are shown in Table 2-10.

TABLE 2-10 List of Planned Equipment

No.	Sub No.	Description	Unit	Q'ty	Main specifications	Location
NU0000		I. Nukus Polytechnic Professional College				
NU1000		1.1 Metalwork				
NU1100		Turnery workshop				
NU1101		Workbench with vise	set	2	Workbench: about 1800 x 900 x 700; vise width (open): 150	WS,1
NU1102		Standard lathe	pc	5	Swing over bed: 330, max. distance between. centers:750, main spindle center:MT:No.4; main spindle speed:60-1500 rpm; no. of feeding speed:20 or more; motor:380V, 3-phase	WS,1
NU1104		Vertical drilling machine	pc	1	Drilling capacity:Φ30, threading capacity:Φ22; speed:60-1500 rpm	WS,1
NU1105		Muffle furnace	pc	1	Max. temp. about 1000 deg.; furnace cap. about 16L; heater, about 4 kW	WS,1
NU1106		Bench drilling machine	pc	1	Drilling cap.:Φ13; speed,60-1500 rpm	WS,1
NU1108		CNC lathe	pc	1	Max. length of work: 490mm; max. diameter of work: Φ275、 X-axis travel 260mm, Z-axis travel 570mm, control device min. setting graduation 0.001mm (X,Y axes), 0.001°(C axis), 10.4 inch LCD	WS,1
NU1109		Bench grinding machine	pc	1	Dia. of grinding stone:Φ205 or more; motor, about 600W	WS,1
NU1110		Bench lathe	pc	1	Swing over table : approx.330、 swing over carriage : 220、 max. center	WS,1
NU1111		Tool set with tool box	set	9	Var. wrenches, pliers, hammers, etc.	WS,1
NU1200		Milling workshop				
NU1201		Workbench with vise	set	2	Workbench: about 1800 x 900 x 700; vise width (open): 150	WS,6
NU1202		Tool grinding machine, handy type	pc	1	Table travel :100mm, grinding stone diameter, 100mm, grinding capacity,φ 3mm ~ 32mm; table swivel angle, 90° ~ 180°	WS,6
NU1203		Universal milling machine	pc	1	Table swivel : ±45 deg., table travel: about 600 L&R x 250 forward & back x 350 up & down, main spindle speed about 60-1800rpm; motor for spindle:approx.3.7kw, feeding motor: approx 0.75kw	WS,6
NU1204		CNC milling machine	pc	1	Max. cutting range: 500(X)x330(Y)x105(Z)mm, main spindle speed 3000 ~ 20000rpm, shank diameter, Φ10 max.	WS,6
NU1205		Bench drilling machine	pc	1	Drilling cap.Φ 3 0 ; threading cap.:Φ 2 2、 speed 6 0 ~ 1 5 0 0 r p m	WS,6
NU1208		Milling machine, vertical	pc	5	Table travel: about 600 , cross travel: approx.250, knee travel: approx.350, main spindle speed: about 60-1800rpm; spindle taper : NST No.40 or equivalent, main motor 1.5kw or more	WS,6
NU1209		Milling machine, horizontal	pc	1	Table travel: about 600, cross travel: 250, knee travel: 350, main spindle speed: about 60-1800rpm; spindle taper : NST No.40 or equivalent, main motor	WS,6
NU1211		Grinding machine, cylindrical type	pc	1	Max. distance between centers: 4 0 0 or more, max. grinding diameter: Φ1 5 0 or more, grinding wheel size: dia. 300 X width about 3 0	WS,6
NU1212		Tool set with tool box	set	9	Var. wrenches, pliers, hammers, etc.	WS,6
NU1300		Metal workshop				
NU1301		Workbench with vise, teacher use	set	1	Workbench: about 1 2 0 0 x 8 0 0 x 7 0 0 ; vise width (open) : 1 5 0	WS,3
NU1302		Workbench with vise	set	9	Workbench: about 1 8 0 0 x 9 0 0 x 7 0 0 ; vise width (open) : 1 5 0	WS,3
NU1304		Bench drilling machine	pc	1	Drilling cap. : Φ 1 3、 main spindle speed : 6 0 ~ 1 5 0 0 r p m	WS,3
NU1305		Vertical drilling machine	pc	1	Drilling cap. : Φ 3 0、 threading cap. : Φ 2 2、 speed : 6 0 ~ 1 5 0 0 r	WS,3
NU1306		Shearing machine	pc	1	Shearing cap. : 1 2 5 0 x 3 . 2 mm; motor, 3 8 0 V , 3 pole	WS,3
NU1307		Bench grinding machine	pc	2	Grinding stone: Φ205 or more; motor, about 600 W	WS,3
NU1308		High-speed cut-off machine	pc	1	Cutting cap.: round bar, 7 5 mm; pipe, 1 3 0 mm; motor, 3 8 0 V , 3	WS,3
NU1309		Band sawing machine	pc	1	Sawing cap.: round bar, 1 0 0 mm or more; pipe, 2 2 0 mm or more; motor, 2 2 0 V , one phase	WS,3
NU1310		Pipe bending machine	pc	1	Max. bending pipe dia.: 2 inches; manual hydraulic type, max. bending angle:	WS,3
NU1311		Press brake	pc	1	Bending capacity: about 1250 mm; press cap., 2 5 tons or more; motor, 3 8 0 V , 3 pole	WS,3
NU2000		1.2 Welding				
NU2001		Standard blocks for hardness testing	set	1	Brinnell hardness : 5 in H B 3 0 0 ~ 1 5 0 range; Rockwell hardness, 5 in H R C 7 0 ~ 2 5 range	WS,5
NU2002		Hardness tester, Rockwell	pc	1	Initial load : 10 k g f ; test load, 6 0 , 1 0 0 , 1 5 0 k g f、	WS,5
NU2003		Hardness tester, Brinell	pc	1	Hydraulic type max. load: 3 0 0 0 k g f	WS,5
NU2004		Magnetic flaw detector	pc	1	Rated current: about 4 . 4 A、 magnetizing power: about 2 6 0 0 (A T) , magnetic flux : 0 . 8 m W b	WS,5
NU2005		Ultrasonic flaw detector	pc	1	Internal C P U ; LCD display; internal wave frequency diffraction , built-in frequency analysis function , power: battery	WS,5
NU2006		Arc welding apparatus	pc	6	Rated input: min. 24 K V A	WS,5
NU2009		Spot welding apparatus, portable	pc	1	Welding cap.: top sheet 0 . 3 ~ 1 . 6mm; bottom sheet 0 . 3 ~ 5 mm	WS,5
NU2010		Spot welding apparatus, fixed type	pc	1	Treadle type; rated cap.: about 1 5 k V A	WS,5
NU2012		Acetylene gas generator	pc	1	Gas generation:1 2 5 m 3 / h or more; gas generation pressure, adjustable at 1 k g / cm 2 or less	WS,5
NU2013		Oxygen gas cylinder	pc	6	Cap.: 3 5 L , 7 m 3 (gas cap.)	WS,5
NU2014		LPG/butane gas cylinder	pc	6	Cap.: 3 5 L , 7 m 3 (gas cap.)	WS,5
NU2015		Welding torch and cutting torch in set	pc	6	Welding torch: welding thickness 3 . 2 mm; cutting torch: max. cutting thickness 3 0 mm	WS,5
NU2016		Gas hose (for oxygen, acetylene, LPG or butane)	pc	6	ISO std. hose Φ 4 . 8 x Φ 1 1 . 2	WS,5
NU2017		Acetylene gas reducer	pc	6	Primary pressure: 2 . 5 M P a ; 2ndary pressure: 0 . 2 M P a	WS,5
NU2018		Oxygen gas regulator	pc	6	Primary pressure: 25MPa; 2ndary pressure: 2.5M P a	WS,5
NU2019		LPG/butane gas regulator	pc	6	Secondary pressure: 2M P a	WS,5
NU2020		Gas torch lighter	pc	6	Manual	WS,5

No.	Sub No.	Description	Unit	Q'ty	Main specifications	Location
NU2021		Gas hose clamp	pc	24	Screw type	WS,5
NU2022		Cart for gas cylinders	pc	2	Carries 2 cylinder; wheels w/ punctureless tires	WS,5
NU2023		Welding rod drying oven	pc	1	Cap. about 50 k g ; max. temp. about 400 deg.C; energy source, 3 8 0 V , 3	WS,5
NU2026		Brazing kit with accessory	set	6	Brazing burner, hose	WS,5
NU2027		Soldering/desoldering with accessory	pc	6	Soldering iron rated current about 1 0 0 W	WS,5
NU2030		DC arc welding apparatus with accessory	pc	1	Rated current: 300 A ; rated input about 1 6 . 4 k V A	WS,5
NU2031		CO2 gas welding apparatus	pc	6	Rated output 350 A ; rated input about: 2 4 . 3 k V A , natural cooling	WS,5
NU2033		Heater for CO2 cylinder	pc	6	Control device w/ heater; heater: about 2 0 0 W	WS,5
NU2036		Electrodes/wire	lot	1	CO2 arc welding use, various type of welding rods	WS,5
NU2046		Welding goods	set	1	Welder's protective goods (mask, apron, gloves)	WS,5
NU2047		Brazing materials	set	2	Silver, brass brazing	WS,5
NU2049		Soldering material	set	1	For sheet work,φ2.0mm、 5kg	WS,5
UH0000		2. Urgench Medical Professional College				
UH1000		2.1 Pharmacy/Nursing				
UH1100		Trainers				
UH1101		Trainer for first aid	pc	1	Usable for practice of artificial respiration; heart massage; total length about 157 cm; battery powered; w/ skill guide	2F,3
UH1103		Trainer for catheterization (male)	pc	1	Suitable for training in use for catheter & cleaning; pliable plastics and acrylic resin; size: nearly life-size	2F,3
UH1104		Trainer for catheterization (female)	pc	1	Suitable for training in use for catheter & enema; pliable plastics and acrylic resin; size: nearly life-size	2F,3
UH1200		Solid and relief models				
UH1201		Head, sagittal section	pc	1	Plastic; 6 parts; size about W24xD24xH29cm; w/ stand	2F,9
UH1202		Brain, arrangement	pc	1	Plastic; 9 parts; size actual; w/ stand	2F,9
UH1205		Spinal cord and nerves	pc	1	Plastic; size actual; w/ stand	2F,9
UH1206		Structure of eye	pc	1	Plastic; 14 parts; size, about W24xD31xH50cm; w/ stand、 台付	2F,9
UH1207		Structure of ear	pc	1	Pliable plastic, 4 parts; size about W34xD20xH21cm、 w/ stand	2F,9
UH1209		Stomach, external and internal surface	pc	1	Plastic, size 1.2X life, w/ stand	2F,9
UH1211		Kidney	pc	1	Pliable plastic; size (right side) 3X life; nephron, 120X life; glomerulus	2F,9
UH1212		Urinary system	pc	1	Pliable plastic; life size; w/ stand	2F,9
UH1216		Liver	pc	1	Plastic; life size; w/ stand; shows blood vessels linked to kidneys. liver, spleen	2F,9
UH1217		Liver organization	pc	1	Plastic; size about W22xD5xH25cm, w/ stand, model, diagrammatic	2F,9
UH1218		Inside surface of the small intestine and the large intestine	pc	1	Life-size relief model. 2 parts	2F,9
UH1220		Organs in torso	pc	1	Plastic; length about 1m 30 parts; w/ revolving stand	2F,9
UH1221		Male sexual organs	pc	1	Plastic; life size, 3 parts、 w/ stand	2F,9
UH1222		Female sexual organs	pc	1	Pliable plastic; life size, 3 parts、 w/ stand	2F,9
UH1227		Skin section	pc	1	Pliable plastic w/ stand; skin section larger than life ;semi-3D model; size about W28xD20xH28cm	2F,9
UH1228		Lymphatic system	pc	1	Special plastic; size 2/3 x life, relief model	2F,9
UH1300		Electrified models				
UH1301		Universal trainer	pc	1	Model: adult female; pliable plastic & hard plastic, body height about 158cm	2F,4
UH1303		Heart	pc	1	Pliable plastic; size 1.4X life, 5 parts w/ stand	2F,4
UH1305		Trunk muscles	pc	1	Female; plastic; life size, 5 parts w/ casters	2F,4
UH1400		Plastic bones & skeleton				
UH1401		Human skeleton (male and female)	pc	1	Japanese adult male; special plastic; life size; w/ casters	2F,11
UH1402		Skull	pc	1	Japanese adult male; special plastic; life size; 3 parts	2F,11
UH1500		Models on anatomy				
UH1501		Bronchial tubes	pc	1	Plastic; 2 parts; size about W2 7 xD18xH5 7 cm、 w/ stand	2F,1
UH1503		Funny-bone and muscles	pc	1	Pliable plastic, 15 parts; life size, w/column & stand	2F,1
UH1504		Hand with adjoined muscles and nerves	pc	1	Pliable plastic; 5 parts; life size w/ stand	2F,1
UH1507		Trunk	pc	1	Neuter torso, plastic; 12 parts, total length about 65 cm、 w/ stand	2F,1
UH1600		Nursing equipment				
UH1601		Supersonic wave radiator	pc	1	Supersonic 2.5 M H Z ; spray cap. 0.2-0.7 m l / min .	3F,8
UH1602		Haemoglobinometer	pc	2	Measurement method: cyanmetahemoglobin;; range 0□25 g /dl; precision	3F,8
UH1604		Calorimeter (photoelectric)	pc	1	Filters: 420、 470、 530、 620、 660nm; indication: metric; light sensor, silicon photo-diode	3F,8
UH1605		Newborn nursery apparatus	pc	1	Type: forced-circulation, sealed; manual controls; 24.9-38.0 deg.C, in 0.1 deg.C steps; size, about W1000x D450xH1200mm	3F,8
UH1606		Stretcher	pc	1	Foldable; aluminum alloy & nylon sheeting; dimensions W510xL1870xH210mm; cap.100kg or more	3F,8
UH1607		UV radiator	pc	2	Dimensions about W900xD650xH1900mm; stainless steel, one 15W light, max. output 7m3/min	3F,8
UH1608		Sterilizer case	pc	4	Dimensions about W400xD250xH300mm	3F,8
UH1610		Trainer for muscular injection, venous injection	pc	5	Suitable for simulation of taking blood & giving injections; incl. 20 blocks for intramuscular injections	3F,8

No.	Sub No.	Description	Unit	Q'ty	Main specifications	Location
UH1611		Electro distiller	pc	1	Ion exchange method; cap. 1.5L/min or more; storage tank 20L or more	3F,8
UH2100		Trainers				
UH2105		Newborn baby bathing and nursery care trainer	pc	1	Usable for training in bathing a newborn infant, treating umbilical cord; overall inspection; enema, diaper changing, sucking milk, urinating, care of <u>aural & nasal passages etc. Male</u>	3F,8
UH2106		Emergency first aid airway suction trainer	pc	1	Practice temporary breathing assistance; internal parts can be observed	3F,8
UH2107		Newborn vital signs demonstrator	pc	1	Practice listening, monitoring newborn baby heartbeat, pulse, temperature	3F,8
UH2108		Childbirth trainer	pc	1	Model of pregnant woman with fetus having heartbeat	3F,8
UH2200		2.2 Pharmacology				
UH2201		Assaying balance	pc	3	Cap. 500gr or more, min. 0.01gr, tray diameter 180mm	3F,3
UH2202		Water bath	pc	4	Water temp. 10□95degC; precision±1.0degC, cap. 6L or more	3F,3
UH2203		Electrical centrifuge	pc	4	Max. 5000rpm;max.RCF, 4620xg; max. cap.1000ml	3F,3
UH2211		Organic chemistry set	set	32	Organic chemical samples, 27; mercury thermometer, mortar & pestle (30,	3F,3
UH2212		Magnetic stirring device without heating	pc	10	100 1500rpm	3F,3
UH2213		Electronic scale	pc	4	Cap. 6000gr or more; min. gradation; 1gr, tray, 130x170mm	3F,3
UH2214		pH-meter and millivoltmeter	pc	4	Digital readings; pH, mV, deg C	3F,3
UH2215		Pressure, volume and temperature apparatus	set	4	Osmotic Pressure Experiment Apparatus, Beckman molecular weight apparatus, Electrolysis apparatus, Hoffman, Boyle Charles' Law experiment apparatus, Mercury manometer, Digital thermometer	3F,1
UH2216		Chemical testing equipment	pc	4	Atmospheric Distillation Unit, Flux Reaction Unit, Producing Gas Reaction Unit, Reaction Unit, Column Chromatography Unit, Soxhlet Extractor Unit	3F,1
UH2217		Biological microscope	pc	4	Binocular; mag. 40-600l w/ halogen lamp	3F,3
UH2218		Top table autoclave	pc	1	Pressure: 0.16Mpa or more; temp. 110, 115, 121, 127 deg.C; stainless steel; cap. 2 0 L or more	3F,1
NA0000		3. Namangan Agro-economic Professional College				
NA1000		3.1 Veterinary				
NA1001		Autoclave	pc	1	Heat sterilizer type, cap. 30 L or more; sterilization temp. about 120 deg C	WS,1
NA1002		Apparatus for electric massage	pc	1	Portable; powerful type; battery-powered	WS,1
NA1003		Blood cell counter	pc	1	Measurement parameters: RGB, Hct, MCV, MCH, 18 others built-in printer, w/ display; measurement time, under 1 min	WS,1
NA1004		Analytical balance	pc	1	Cap. about 5 0 0 g, min. division 0 . 0 1 g	WS,1
NA1006		Big and small devices for feces of animals	pc	5	Kit including beaker, revolving tray, filter, urine siphon, pipette, etc.	WS,1
NA1007		Big pathologoanatomic tool kit	set	1	Kit with forceps, dissecting knife, knife for muscles., tendons, etc.	WS,1
NA1008		Vaginal mirror for female animals	pc	5	3-item set (milk cow, large cow and small cow (latter w/o previous birthing	WS,1
NA1009		Endoscopes	pc	1	Tube length about 120cm; dia. about 10mm; w/ power source device	WS,1
NA1010		Thermometers for animals	pc	13	Length: about 1 0 0 m m	WS,1
NA1011		Histological preparation set	pc	1	Histological set having standard animal tissue selection, 20 or more & pathological specimens 30 or more	WS,1
NA1012		Drug shooting pistol for animals	pc	1	Dosing catheter & balling gun for administering drugs	WS,1
NA1013		Manometer for animals	pc	5	Measurement range: about 0-280mm Hg (blood pressure); about 4 0 ~ 1 8 0 beats/min (pulse)	WS,1
NA1014		Tool set for measuring animal size	pc	1	Set of weighing tape for cow, stable gauge for cattle and pelvismeter	WS,1
NA1015		Percussion hammer with pleximeter	pc	2	Hammer about 180 m m	WS,1
NA1016		Injector for animal	pc	5	Max. injectable amt : 3 0 m l	WS,1
NA1017		Urinary catheter in set	pc	1	Length about 90 c m; thickness about 7 mm	WS,1
NA1018		Milking catheter in set	pc	1	With internal core , total length about 70 m m; thickness about Φ 3 m m	WS,1
NA1019		Cage for laboratory animals	pc	2	Cage of stainless steel; WxHxD about 950x750x700	WS,1
NA1020		Magnetic probes	pc	1	Dimensions about Φ 3 0 x 1 7 0 m m	WS,1
NA1021		Biological microscope for students	pc	13	Mag. 40-600 x; lens WF 1 0 x、WF 1 5 x	WS,1
NA1022		Veterinary- obstetrical tool kit	set	1	Obstetrical finger knife, other devices, 13 in all, as set	WS,1
NA1023		Forceps for cutting hoofs	pc	1	Set of 10 instruments for cutting, trimming hooves	WS,1
NA1024		Hoof examination instrument	pc	1	Set of 3 devices for examining hoof form	WS,1
NA1025		Tool kit, surgical large	set	1	Surgical scalpel, surgical forceps, total 17 instruments in set	WS,1
NA1026		Probe for nasopharynx (nose/throat)	pc	1	Size about 2.25m X Φ16mm	WS,1
NA1027		Probe for esophagus	pc	1	Thygesen enterable tube	WS,1
NA1028		Metal detector	pc	1	Portable; battery powered	WS,1
NA1029		Device for testing /assessing milk quality	pc	1	Gerber's sulfuric acid dispenser, specific gravity meter (for milk), butyrometer	WS,1
NA1030		Device for taking blood	pc	1	Phlobotomy syringe needle about Φ 1.1; cap. 10 ml	WS,1
NA1031		Device for inhalation	pc	1	Components: face mask, atomizer, compressor	WS,1
NA1032		Device for mastitis milk	pc	1	Portable type; method of measurement: indirect, using electro-conductivity of	WS,1
NA1033		Device for identifying trichinosis	pc	1	Counting board for parasite eggs	WS,1
NA1034		Portable disinfections unit	pc	1	Backpack type sprayer, tank cap. about 13L	WS,1
NA1035		Galvanized table necrotomy of big animals	pc	1	Stainless steel; for large animals	WS,1
NA1036		Electronic balance	pc	1	Cap. about 6 0 0 0 g , min. reading 1 g	WS,1
NA1037		Alcohol meter	pc	5	3 in set, w/ thermometer	WS,1

No.	Sub No.	Description	Unit	Qty	Main specifications	Location
NA1038		Universal bench for fixing animals	pc	1	Frame dimensions about 1 3 0 0 x 1 8 0 0 x 2 0 0 0	WS,1
NA1039		Stetho-phonendoscope	pc	2	Rubber tube length about 1 m	WS,1
NA1040		Table for instruments	pc	1	Dimensions (WxLxH) about 4 0 x 6 0 x 8 0 c m	WS,1
NA1041		Shelf for instruments	pc	1	Steel frame, lock, double-doors	WS,1
NA1042		Surgery table for big animals with light	set	1	Total length about 2.5 m; total width about 1 . 5 m	WS,1
NA1043		Surgery table for small animals with light	set	1	Dimensions about 550 x 1500 x 7 5 0 ~ 1 0 0 0 mm (D , W , H)	WS,1
NA1044		Water heating apparatus with thermostat	pc	1	Tank cap. about 30L; thermostatic temp. control; temp. range max 100 deg C	WS,1
NA1045		Trocar	set	5	Three; dia.Φ 5 , 6 , 7 mm	WS,1
NA1046		Refrigerator	pc	1	Cap. about 350 L or more	WS,1
NA1047		Centrifuge	pc	1	Max. speed about 5000rpm; dimensions about 450 x 450 x 450	WS,1
NA1048		Syringe-injectors in set	set	5	5 in set	WS,1
NA1049		Electrocardiograph	pc	1	No. of channels: 1 / 2; LCD display; printer: thermal or equiv.	WS,1
NA1050		Freezer	pc	1	Cap. about 4 0 0 L	WS,1
NA1051		Electric oven with time switch	pc	1	Plate dimensions about 350 x 250mm; temp. range about 50 ~ 2 5 0 ° C	WS,1
NA1052		Cow model for insemination	pc	1	Functions: extracting semen; adjustable height; manual hydraulic operation	WS,1
NA1053		Model of cow skeleton	pc	1	1/4 scale model or more	WS,1
NA1054		Model of cow internal organs, muscular	pc	1	Plastic; 10 or more parts	WS,1
NA2000		3.2 Agronomy				
NA2001		Soil sieve	pc	1	1 2 "dia. ASTM sieve, 8-9 sizes in set	WS,8
NA2002		Electronic balance	pc	1	Max. about 6000 g ; min. gradation 1g	WS,8
NA2003		Analytical balance	pc	1	Max. about 500 g ; min. gradation 0 . 0 1 g	WS,8
NA2004		Pot-soil heating apparatus	pc	6	Pot dimensions 140(D)x150(H)mm, cap. 3 ~ 4 pots; temp. settings 5 ~ 40□	WS,8
NA2005		Desiccators	pc	6	Set of 3 diameters, about Φ300,Φ210,Φ150	WS,8
NA2006		Cool incubator	pc	1	Cap. about 150 L; temp. range + 5 ~ 8 0 ° C	WS,8
NA2007		Soil compaction testing apparatus	pc	1	Compactor and density measurement device	WS,8
NA2008		Soil auger	pc	1	Augur dia. about Φ 70, length about 1 . 2 5 m	WS,8
NA2009		Soil color chart	pc	1	3 2 2 or more colors	WS,8
NA2010		Biological microscope	pc	6	Mag. 4 0 X ~ 4 0 0 X	WS,8
NA2011		Titration device for chemical analysis of fruits and vegetables	pc	1	Set of general titration apparatus consisting of burette, pipette, and others and kinds of reagent such as NaOH and HCl	WS,8
NA2012		Sulphate test strips	pc	1	Measurement range: about 2 0 0 ~ 9 0 0 m g / L	WS,8
NA2013		Laboratory pH meter	pc	1	Measurement method: glass electrode	WS,8
NA2014		Hydroponics complete analysis kit	set	1	Device capable of analyzing solution for N, P, H ₃ , Ca, K, Mg etc. (total, 10); calorimetric measurement	WS,8
NA2015		Salinity meter	pc	1	Measurement range: about 0 ~ 2 8 %;portable	WS,8
NA2016		Soil moisture meter with soil moisture	pc	1	Measurement method: soil block(soil moisture sensor); supplied w/ soil blocks	WS,8
NA2017		Current flow meter	pc	1	Measurement section: propeller type; range about 0 . 3 ~ 3 . 5 m/s; max. water depth about 30cm or more	WS,8
NA2018		Soil thermometer	pc	6	Measurement range: about - 1 0 ~ 5 0 ° C ; measurement depth in soil up to about 3 0 c m	WS,8
NA2019		Spectrophotometer	pc	1	Range: 3 2 0 ~ 9 5 0 nm or more; display: customized LCD	WS,8
NA2020		Chromatography	pc	1	Components: 6 glass tubes (Φ 3 5 m m) ; stand; filter paper	WS,8
NA2021		Colorimeter	pc	1	Range: 4 0 0 ~ 7 0 0 nm or more; display L E D	WS,8
NA2022		Penetrometer	pc	1	Cap.: 1 K N , cone angle: 3 0 °	WS,8
AS0000		4. Asaka Agricultural Professional College				
AS1000		4.1 Operation and maintenance of agricultural machines and equipment				
AS1001		Tractor structure trainer	pc	1	Cutaway model of farm tractor for educational use; operable with geared motor : w/ stand	WS,3
AS1002		Diesel engine trainer	pc	1	Motor vehicle diesel engine w/ transmission, capable of disassembly/assembly for practice use	B3,1F,3
AS1003		Model of fuel system	pc	1	Simulator of electronic control carburetor	B3,1F,3
AS1004		Model of internal combustion engine,	pc	1	Motor vehicle use 4-cylinder diesel engine cutaway model, w/ transmission	B3,1F,3
AS1005		Model of 4-timely motor of internal combustion engine, sectioned	pc	1	Motor vehicle use 4-cylinder gasoline engine, cutaway model	B3,1F,3
AS1006		Car structure trainer	pc	1	Cutaway model of entire motor vehicle; low-speed operation by motor	B3,1F,3
AS1007		Model of fuel injection pump	pc	1	Cutaway model of fuel injection pump for diesel engine, Bosch type	B3,1F,3
AS1008		Model of carburetor	pc	1	Motor vehicle gasoline engine carburetor cutaway model	B3,1F,3
AS1009		Model of starting motor	pc	1	Starter motor for breakdown repair work, w/ current and voltage meters	WS,5
AS1010		Model of transmission	pc	1	Motor vehicle transmission cutaway model	B3,1F,3
AS1011		Model of clutch	pc	1	Motor vehicle clutch cutaway model	WS,8
AS1012		Model of rear axle, sectioned	pc	1	Motor vehicle rear axle cutaway model	B3,1F,3
AS1013		Working model of rear axle	pc	1	Motor vehicle rear axle, rear-wheel drive type, working model	B3,1F,3
AS1014		Four-wheel tractor	pc	1	Engine output: 80 PS or more; rear-wheel drive	WS,20
AS1015		Three-wheel tractor	pc	1	Engine output: 80 PS or more; rear-wheel drive	WS,21
AS1017		Disk harrow	pc	1	Tractor attachment: 3-point link connection; req. horsepower up to 70 P S	WS,21
AS1018		Vegetable seeding-machine	pc	1	Tractor attachment: 3-point link connection; req. horsepower up to 70 P S	WS,21

No.	Sub No.	Description	Unit	Q'ty	Main specifications	Location
AS1019		Spreader of mineral fertilizers	pc	1	Tractor attachment: 3-point link connection; req. horsepower up to 70 P S	WS,20
AS1020		Cultivator	pc	1	Tractor attachment: 3-point link connection; req. horsepower up to 70 P S	WS,20
AS1021		Subsoil cultivator	pc	1	Tractor attachment: 3-point link connection; req. horsepower up to 70 P S	WS,20
AS1022		Sprayer for pest control	pc	1	Tractor attachment: 3-point link connection; req. horsepower up to 70 P S	WS,20
AS1023		Potato digger	pc	1	Tractor attachment: 3-point link connection; req. horsepower up to 70 P S	WS,21
AS1024		Rotor mowing-machine	pc	1	Tractor attachment: 3-point link connection; req. horsepower up to 70 P S	WS,20
AS1025		Standard lathe	pc	1	Swing over bed : about 330 mm; distance between centers: about 5 5 0	WS,19
AS1026		Desk drilling lathe	pc	1	Drilling cap. 13mm; speed 6 0 ~ 1 5 0 0 r p m	WS,19
AS1027		Arc welding apparatus	pc	1	Rated input about 2 4 K V A	WS,7
AS1028		Spot welding apparatus	pc	1	Rated input about 1 5 K V A	WS,7
AS1029		Balancing machine	pc	1	Allowable tire load about 70 kg	WS,17
AS1030		Gas welding apparatus	set	1	Set of acetylene gas generator; welding torch; cutting torch	WS,7
AS1031		Torque wrench	pc	2	Max. measured torque about 1 0 0 N · m	WS,3
AS1032		Distilling apparatus	pc	1	Distillation equip. w/ tank of about 2 KW cap.	WS,21
AS1033		Hydraulic stacker truck	pc	1	Handtruck, 2 ton cap.	WS,21
AS1034		Full set of tools for metal soldering	set	1	Solder & soldering tools	WS,3
AS1036		Hydraulic jack	pc	1	Hydraulic jack as used in garages; 3 tons; manual moving	WS,17
AS1037		Tire pressure measuring instrument	pc	1	Usable as cylinder pressure meter for diesel engines and with adaptor(s) for other applications	WS,17
AS1038		Compressor	pc	1	Max. pressure: 0.9Mpa; tank cap. about 80L	WS,17
AS1040		Oil pump	pc	1	Pump for drum cans; manual	WS,17
AS1041		Oil bucket pump	pc	1	Pump for buckets, about 20L; manual operation	WS,17
AS1042		Riveter	pc	1	Portable; manual operation	WS,18
AS1043		Battery charger	pc	1	DC output: 6-12V, 40A; 18-24V, 20A	WS,5
AS1044		Equipment for repair, assembling and disassembling of tires	pc	1	Semiautomatic large-size tire changer	WS,17
AS1045		Hand mechanized tools set	set	4	40-item tool set for repair use	WS,17
AS1046		Grease gun	pc	1	Manual	WS,17
AS1047		Lubricator	pc	1	Pneumatic; pressure about 7 kg/cm ² ; cap. about 8L	WS,17
KO0000		5. Kokand Professional College of Human Services				
KO1000		5.1 Public catering				
KO1100		5.1.1 Catering department				
KO1101		Rotary grill	pc	1	Infrared; revolving; 9 types of program memory; external materials: SUS304; power consumption 11.3kW	WS,42
KO1102		Bakery oven	pc	1	External dimensions: about W1330xD1070xH1800 mm; 6 shelves; energy consumption 15kW	WS,44
KO1103		Bakery fermentation box	pc	1	External dimensions: about W1030xD890xH1930,, ; 20 shelves ; energy consumption 15kW	WS,44
KO1104		Steamer	pc	2	External dimensions: about W600xD670xH1650 mm ; effective cap. about	WS,41
KO1106		Siphon pump for oil	pc	1	Total length about 685mm; stainless steel	WS,43
KO1107		Mixer for forming	pc	1	Cap. about 7L; solid state; speed 132-594 r p m; energy consumption 650W	WS,41
KO1108		Molder	pc	1	External dimensions: about W1130xD510xH1160 mm cap. 2400/h ; energy consumption 0.29 k W	WS,44
KO1109		Mixer for viscous materials	pc	1	External dimensions: about W260xD330xH430 mm; cap. 5L; energy consumption 250W; w/ mincer	WS,41
KO1110		Tableware washing machine	pc	1	External dimensions: about W670xD750xH1420 mm; cap. 6 0 racks/h; energy consumption 16 k W	WS,43
KO1113		Fryer	pc	2	External dimensions: about W850xD688xH215 mm; frying area about W500xD350mm; oil vol. 9 x 2L; energy consumption 12 k W; countertop type	WS,41
KO1114		Juicer	pc	1	External dimensions: about W275xD260xH660 mm; cap. 6L; speed 17500rpmhigh; 3 speeds); energy consumption 1.4 k W	WS,41
KO1115		Hot storage box	pc	1	External dimensions: about W680xD910xH1790 mm; shelves, 12; energy consumption 1.36 k W; exterior stainless steel	WS,43
KO1117		Refrigerator	pc	1	External dimensions: about W1200xD650xH1950mm; freezer compartments, 2 doors, 4; energy consumption 271W for refrigerator, 412W for freezer; temp. -6 to +12 for refrigerator. -25 to -15 for freezer	WS,43
KO1118		Range with oven	pc	1	External dimensions: about W1200xD600xH850mm, double oven; heater, 2.5 x 2kW; energy consumption 17kW	WS,41
KO1119		Grille	pc	1	External dimensions: about W500xD750xH265 mm; griddle area, W500xD484mm; energy consumption 8.4kW	WS,41
KO1121		Braising pan	pc	1	External dimensions about W1090xD977xH850 mm ; pan cap. 75L ; energy consumption 9kW	WS,441
KO1122		Steamer	pc	1	External dimensions: about W600xD670xH1650 mm ; effective cap. 240L; energy consumption 18kW	WS,44
KO1200		5.1.2 Teaching bread-roll department				
KO1205		Dividing and making roll dough machine	pc	1	External dimensions: about W830xD570xH1540mm; no. of subdivisions made: 30; energy consumption 1.1kW	WS,44
KO1208		Kneader for dough	pc	1	Stainless bowl, inside dia. 410 mm, depth 410 mm, cap. 50L; speed 108、205、283、365rpm (4 speeds) ; external dimensions about W752xD840xH1321mm; energy consumption 1.5kW	WS,44
KO1210		Reverse sheet	pc	1	External dimensions: about W2300xD650xH1055 mm ; cap.2-3 k g、 energy consumption : 0.4kW	WS,44
KO2000		5.2 Repair and service of radio engineering and tele-equipment				

No.	Sub No.	Description	Unit	Q'ty	Main specifications	Location
KO2100		5.2.1 Study room of radio electric devices				
KO2107	1	Laboratory stands " electronic amplifiers "	set	2	Circuit for workshop practice, for basic amp circuit (offset, DC amp, AC amp, band bus filter) etc.	B4,2F,7
KO2107	2	Oscilloscope	pc	2	Frequency characteristics D C -20M H z , 2 channels	B4,2F,7
KO2107	3	Voltmeter	pc	2	Measured voltage 1m V -300 V ; input impedance 10 MΩ	B4,2F,7
KO2107	4	Functional generator	pc	2	Wave forms: sine wave, rectangular wave, triangular wave, pulse wave, sawtooth wave; generated freq. 0.5-5 M H z	B4,2F,7
KO2108	1	Stand " Radio reception - sending devices "	set	2	Source signal: C W , A M , F M ; freq. 60 M H Z band; reception, C W , A M , F	B4,2F,7
KO2108	2	LF Signal Generator	pc	4	Generated freq.: 10 H z -1 M H z sine wave	B4,2F,7
KO2108	3	Volt meter	pc	4	Measured voltage 1m V -300 V ; input impedance 10 MΩ	B4,2F,7
KO2108	4	Frequency Counter	pc	4	Frequency measured 5 H z -2.4 G H z ,	B4,2F,7
KO2108	5	Oscilloscope	pc	4	Frequency characteristics D C -20M H z ; 2-channel	B4,2F,7
KO2108	6	RF Signal Generator	pc	4	Generated freq. 100 k H z -2 G H z F M , A M	B4,2F,7
KO2113	1	Stand " Pulse digital engineering "	set	2	For practice regarding time division; P W M , P P M , P A M , demodulation and amplification circuits	B4,2F,7
KO2113	2	LF Signal Generator	pc	2	Generated freq.: 10 H z -1 M H z sine wave	B4,2F,7
KO2113	3	Volt meter	pc	2	Measurement voltage: 1m V -300 V ; input impedance, 10 MΩ	B4,2F,7
KO2113	4	Oscilloscope	pc	2	Frequency characteristics D C -20M H z ; 2 channels	B4,2F,7
KO2113	5	Frequency Counter	pc	2	Frequency measurement 5 H z -2.4 G H z ,	B4,2F,7
KO2116	1	Stand " Amplifiers of a constant current "	set	1	Practice regarding voltage amp, power amp, tuning amp circuits	B4,2F,7
KO2116	2	LF Signal Generator	pc	1	Generated frequency 10 H z -1 M H z sine wave	B4,2F,7
KO2116	3	Volt meter	pc	1	Measurement voltage: 1m V -300 V , input impedance 10 MΩ	B4,2F,7
KO2116	4	Oscilloscope	pc	1	Frequency characteristics D C -20M H z ; 2 channels	B4,2F,7
KO2117	1	Circuit of power supplies	set	1	Practice with circuits for rectification smoothing, DC stabilization	B4,2F,7
KO2117	2	Volt meter	pc	1	Measurement voltage: 1m V -300 V ; input impedance 10 MΩ	B4,2F,7
KO2117	3	Oscilloscope	pc	1	Frequency characteristics D C -20M H z ; 2 channels	B4,2F,7
KO2200		5.2.2 Study room of " Radio engineering and TV bases "				
KO2203	1	Unwrapped breadboard model of the TV	set	2	N T S C , P A L , S E C A M circuit model	B4,2F,1
KO2203	2	Color Pattern Generator	pc	2	N T S C , P A L , S E C A M types; output patterns – crosshatch, convergence, checker	B4,2F,1
KO2203	3	Sweep Generator	pc	2	Sweep freq.: I F / L W M W / S W / F M band; sweep range 10 K H z -36 M H	B4,2F,1
KO2204		Video recorder	set	2	Video recorder circuit model	B4,2F,1
KO2205		Cassette tape recorder	set	2	Cassette; CD circuit model	B4,2F,1
KO2206		Amplifier (15 W)	pc	1	Output 40 W output resistance 4 - 16Ω	B4,2F,1
KO2207		Columns (15 W)	pc	1	Output 20 W; frequency characteristics 130Hz-10kHz	B4,2F,1
KO2208		Radio-receiver	pc	1	Reception of F M , L W , M W , S W 1-4	B4,2F,1
KO2212		Video camera	pc	1	Handy type LCD monitor built-in	
KO2216		Oscillograph 100 MHz	pc	1	Frequency characteristics DC-1GHz, 4 channels	B4,2F,1
KO2218		Spectral multi meter	pc	2	Measurable frequency range: 1 - 1800 M H z scan range 0.1-100 M H z / D I	B4,2F,1
KO2220		Digital L, C, R measurement	pc	1	Measurement range: 0.1uH-199.9H C:0.1pF-1999uF R:0.001-19.99MΩ	B4,2F,1
KO2223		Power supply	pc	5	AC 20 V , 5 A ; D C 0-20 V , 5 A	B4,2F,1
KO2225		Universal tester for diodes and transistors	pc	1	Testable semiconductors: transistors, diodes, thyristor	B4,2F,1
KO2233		Color TV set	pc	1	21 inches; multisystem	B4,2F,1
KO2235		Lamp-transistor TV set	pc	1	15 inches; T F T ; LCD panel; multisystem	B4,2F,1
KO2300		5.2.3 Workshop on tele-radio apparatus repairs				
KO2301		Autotransformer	pc	5	A C 0-260 V 3 A	B5,2F,1
KO2303		Radio repairs tool sets	set	25	Pliers, drivers, soldering iron etc.	B5,2F,1
KO2305		Oscillograph	pc	5	Frequency characteristics DC-20MHz, 2 channels	B5,2F,1
KO2308		Welder apparatus of weld	pc	2	50-130 A	B5,2F,1
KO2309		Drilling machine tool	pc	2	Iron: 13mm Wood: 35mm Speed: 0-600 r p m	B5,2F,1
KO2310		Signal generator	pc	1	Generated signal: 100 k H z -2 G H z F M , A M	B5,2F,1
KO2311		Metal joiner's bench	set	2	1800 x 900 x 750	B5,2F,1
KO2314		Desk lathe	pc	1	Core to core distance 200 mm Distance between centers : 120 mm ; spindle M T N o. 1	B5,2F,1
KO2320		Tester	pc	25	Measurement: DC voltage, current, AC voltage, current, resistance, capacitance, frequency	B5,2F,1
KO2322		Functional generator	pc	1	Output wave forms: sine wave, square wave, triangular wave, pulse wave, sawtooth wave; generated freq.: 0.5-5 M H z	B5,2F,1
BU0000		6. Bukhara Construction and Municipal Professional College				
BU1000		6.1 Installation and repair of equipment for gas supply system				
BU1001		Pressure test apparatus	pc	1	Gas flow meter precision ±0.02%; compressor 0.42 L/h , 1 M p a	WS,6
BU1002		Gas meter installed in provider	pc	2	Flow 2 . 5 - 5 0 m 3 / h	WS,6
BU1003		Gas meter installed in house	pc	2	Flow 2 m 3 / h	WS,6
BU1004		Equipment for measuring combustion	pc	2	Oxygen, CO2, CO, NOX measurement	WS,6

No.	Sub No.	Description	Unit	Q'ty	Main specifications	Location
BU1005		Hand-operated pipe threader	pc	12	Usable dim.: 1/2-3/4,1-1.1/4,1.1/2-2"; weight, 12 kg	WS,6
BU1006		Electrical pipe threader	pc	2	Threading cap. 1 / 2 - 2 " ; motor 750W	WS,6
BU1007		Hand-operated pipe bender	pc	1	Bending shoe: 3/8-1" , qty 4	WS,6
BU1008		Electrical pipe bender	pc	2	Bending shoe: 3/8-1" , qty 4,350W	WS,6
BU1009		Power hacksaw	pc	1	Cutting cap.: dia. 1 8 0 mm	WS,6
BU1010		Reciprocating saw	pc	4	Cutting cap.: dia. 210mm (45deg)	WS,6
BU1011		Hand-operated pipe cutters	pc	12	Cutting cap.: 5-42 mm; total length 140 mm, radius of rotation 105 mm	WS,6
BU1012		Electrical pipe cutters	pc	2	Cutting cap.: 15-150A; motor, 1050W, stroke cap.26 mm	WS,6
BU1013		Pipe vise with tripod	pc	4	Usable dimensions: 1/3-2.1/2	WS,6
BU1015		Hand-operated chain hoist	pc	2	Rated load: 2t; Lifting capacity: 3m	WS,6
BU1016		Flame propagation and stability experimental apparatus	pc	1	Flow meter, 600L/h; accessories	WS,6
BU1019		Reynolds experimental apparatus	pc	1	Test equipment	WS,6
BU1021		Resistant loss measuring apparatus	pc	1	Exterior dimensions: about W2500xD870xH1800 mm; pressure drop in straight pipe, at bends, at fittings; orifice & Venturi meter flow	WS,6
BU2000		6.2 Installation of electric networks and equipment				
BU2002		Displaced current ampere meters (digital)	pc	5	AC 5/10/25 A	EB,1F,5
BU2004		Sun batteries	pc	5	Amorphous silicon solar D C 8.5 V M A X 0.7W	EB,1F,5
BU2005		Baths with electrode	pc	3	Glass tube 0-50 m l 0.2 m l graduations	EB,1F,5
BU2006		Low voltage power source	pc	3	D C 0-36 V M A X 3 A	EB,1F,5
BU2012		Indicators of induction magnet field	l	1	Measurement range: 0-1000m T [0-15000 G] , precision +/- 0.5%	EB,1F,5
BU2013		Variable transformer	pc	3	A C 0-260 V 3 A	EB,1F,5
BU2015	1	AC current motor test bench	set	1	DC motor- DC generator , AC motor- DC generator, DC motor-AC generator device, stand-mounted type	EB,1F,5
BU2015	2	Volt/Ammeter	pc	3	Measurement: DC voltage, current; AC voltage, current; resistance; capacitance; cycles	EB,1F,5
BU2015	3	Tacho Meter	pc	3	Measurement range 60-50,000rpm	EB,1F,5
BU2015	4	Load Rheostat	pc	2	3KVA 0-30A	EB,1F,5
BU2015	5	3-Phase Load Rheostat	pc	1	3KVA 0-4.6A	EB,1F,5
BU2015	6	Watt Meter	pc	3	3-phase 380V 5/25A	EB,1F,5
BU2016	1	Electronic Network test bench	set	3	Element no-fuse breaker; breaker; switch; lamp; wiring parts	EB,1F,5
BU2016	2	Megger	pc	3	Test voltage 1000 V ; insulation resistance 2000 MΩ	EB,1F,5
BU2016	3	Clamp Multimeter	pc	6	DC voltage 120m-1200V; AC voltage 6-1200V; direct voltage. Resistance	EB,1F,5
BU2016	4	Lux Meter	pc	3	Measurement range 20-200,000 lux	EB,1F,5
BU2021		Shop of laboratory resistance	pc	3	Wheatstone bridge learning device	EB,1F,5
BU2023		Milliammeter	pc	3	Measurement range: about 0-50mA	EB,1F,5
BU2025		Complete of capacitors	pc	3	Capacitance test equipment	EB,1F,5
BU2031		Oscillographs	pc	3	Frequency characteristics D C -20MHz; 2 channels	EB,1F,5
BU2033		High voltage transformer	set	1	Output 0-50,000V 5KVA	EB,1F,5
BU2034	1	Relay test bench	pc	2	Equipment for practice regarding power interruption relay, low voltage relay, overvoltage relays	EB,1F,5
BU2034	2	Megger	pc	2	Test voltage 1000 V ; insulation resistance, 2000 MΩ	EB,1F,5
BU2034	3	Relay Tester	pc	2	Overvoltage, voltage, earth relay testing; guard relays;line voltage 0-15K V	EB,1F,5
BU2034	4	Multi Tester	pc	2	DC voltage 50m-1000V; AC voltage 50m-1000V; DC current. Resistance	EB,1F,5
BU2034	5	Earth Tester	pc	2	Earth resistance measurement: 10-1000Ω	EB,1F,5
BU2035		Instruments for demonstration rules of Lenz	set	1	Main coil dia. 1.3 m m ; 200 coils; 2ndary coil dia. 0.5mm, 500 coils	EB,1F,5
BU2042		Rheostat	pc	3	Slide resistor: current 4/8 A ; resistance15/3.75Ω	EB,1F,5
BU2045	1	Load test bench	set	2	Overvoltage; cap. 3KVA	EB,1F,5
BU2045	2	LCR Meter	pc	2	Measurement range: about L : 0.1uH-199.9H C:0.1pF-1999uF R:0.001-	EB,1F,5
BU2045	3	Voltmeter	pc	2	AC voltage 30-750 V ; DC current 0.15-30 A	EB,1F,5
BU2045	4	Power Factor Meter	pc	2	Freq. used 45-65 H z AC current 5/25 A 0.5-1.0-0.5rag	EB,1F,5
BU2045	5	Wattmeter	pc	2	Measurement range: single pole120/240 V about 5/25A	EB,1F,5
BU2049		Laboratory thermometers	pc	3	Measurement range-30□—150□ and -99.9□-1250□	EB,1F,5
BU2050		Thermo resistors on log	pc	3	Sensor measurement range -30 —150	EB,1F,5
BU2051		Thermopolis	pc	1	Sensor measurement range -100 —300	EB,1F,5
BU2053	1	Transformers test bench	set	3	1 pole 2 K V A 220 V /110 V 3 in set	EB,1F,5
BU2053	2	Wattmeter	pc	3	Measurement range: single pole120/240 V about 5/25A	EB,1F,5
BU2053	3	Voltmeter	pc	3	AC voltage 30-750 V ; AC current 0.15-30 A	EB,1F,5
BU2053	4	Power Factor Meter	pc	3	Freq. used 45-65 H z ; current 5/25 A 0.5-1.0-0.5rag	EB,1F,5
BU2053	5	Load Rheostat	pc	3	0-3 K V A 1 pole 240 V	EB,1F,5
BU2053	6	3-Phase Load Rheostat	pc	3	0-3 K V A 3 pole 380 V	EB,1F,5
BU2059		Hand drill	pc	3	1200 r p m chuck 10mm	EB,1F,5
BU2060		Coil winding	pc	3	Manual; elec. wire dia. 0.1-2.0 mm	EB,1F,5
BU2061		Motor sets	set	13	Assembly kit 3 pole 380 V 50 H z	EB,1F,5
BU2062		Trans kit	set	13	Assembly kit 1 pole 220 V 50 H z	EB,1F,5
BU2063		Distribution Assembly Kit	set	13	Pliers, screwdrivers, soldering equipment, other Relays, switches, voltmeters, current meters	EB,1F,5
BE0000		7. Beshkent Agricultural Professional College				

No.	Sub No.	Description	Unit	Q'ty	Main specifications	Location
BE1000		7.1 Zootechnics				
BE1001		Autoclave	pc	1	Heat sterilizer type, cap. 30 L or more; sterilization temp. about 120 deg C	WS1,7
BE1002		Apparatus for electric massage	pc	1	Portable; powerful type; battery-powered	WS1,7
BE1003		Blood cell counter	pc	1	Measurement parameters: RGB, Hct, MCV, MCH, 18 others built-in printer, w/ display; measurement time, under 1 min	WS1,7
BE1004		Analytical balance	pc	1	Cap. about 5 0 0 g, read-out calibration 0 . 0 1 g	WS1,7
BE1006		Big and small devices for feces of animals	set	5	Kit including beaker, revolving tray, filter, urine siphon, pipette, etc.	WS1,7
BE1007		Big-animal pathologoanatomic tool kit	set	1	Kit with forceps, dissecting knife, knife for muscles & tenons etc.	WS1,7
BE1008		Vaginal mirror for female animals	pc	5	3-item set (milk cow, large cow and small cow (latter w/o previous birthing	WS1,7
BE1009		Endoscopes	pc	1	Tube length about 120cm; dia. about 10mm; w/ power source device	WS1,7
BE1010		Thermometers for animals	pc	13	Length about 1 0 0 mm	WS1,7
BE1011		Histological preparations set	pc	1	Histological set having standard animal tissue selection, 20 or more & pathological specimens 30 or more	WS1,7
BE1012		Drug shooting pistol for animals	pc	1	Dosing catheter and balling gun for administering drugs	WS1,7
BE1013		Manometer for animals	pc	5	Measurement range: about 0-280mm Hg (blood pressure); about 4 0 ~ 1 8 0 beats/min (pulse)	WS1,7
BE1014		Tool set for measuring animal size	pc	1	Set of weighing for cow, stable gauge for cattle and pelvimeter for cattle	WS1,7
BE1015		Percussion hammer with pleximeter	pc	2	Hammer about 180 mm	WS1,7
BE1016		Injection syringe	pc	5	Max. injectable amt : 3 0 m l	WS1,7
BE1017		Urinary catheter in set	pc	1	Length about 90 c m; thickness about 7 mm	WS1,7
BE1018		Milking catheter in set	pc	1	With internal core , total length about 70 mm; thickness aboutΦ 3 mm	WS1,7
BE1019		Cage for laboratory animals	pc	2	Cage of stainless steel; WxHxD about 950x750x700	WS1,7
BE1020		Magnetic probes	pc	1	Dimensions about Φ 3 0 x 1 7 0 mm	WS1,7
BE1021		Biological microscope for students	pc	13	Mag. 40-600 x; lens W F 1 0 x、 W F 1 5 x	WS1,7
BE1022		Veterinary- obstetrical tool kit	set	1	13 instrument set including obstetrical finger knife, others	WS1,7
BE1023		Forceps for cutting hoofs	pc	1	Set of 10 instruments for cutting, trimming hooves	WS1,7
BE1024		Hoof examination instrument	pc	1	Set of 3 devices for examining hoof form	WS1,7
BE1025		Tool kit, surgical large	set	1	Surgical scalpel, surgical forceps, total 17 instruments in set	WS1,7
BE1026		Probe for nasopharynx (nose/throat)	pc	1	Size about 2.25m X Φ 16mm	WS1,7
BE1027		Probe for esophagus	pc	1	Thygesen enterable tube	WS1,7
BE1028		Metal detector	pc	1	Portable; battery powered	WS1,7
BE1029		Device for testing /assessing milk quality	pc	1	Set of Gerber sulfuric acid dispenser、 specific gravity meter, butyrometer	WS1,8
BE1030		Device for taking blood	pc	1	Phlebotomy syringe needle about Φ 1.1; cap. 10 ml	WS1,8
BE1031		Device for inhalation	pc	1	Components: face mask, atomizer, compressor	WS1,8
BE1032		Device for mastitis detection using milk	pc	1	Portable type; method of measurement: indirect, using electro-conductivity of	WS1,8
BE1033		Device for identifying trichinosis	pc	1	Counting board for parasite eggs	WS1,8
BE1034		Portable disinfection unit	pc	1	Backpack type sprayer, tank cap. about 13L	WS1,8
BE1035		Galvanized table necrotomy of big animals	pc	1	Stainless steel; for large animals	WS1,8
BE1036		Electronic balance	pc	1	Cap. about 6 0 0 0 g , min. reading 1 g	WS1,8
BE1037		Alcohol meter	pc	5	3 in set, w/ thermometer	WS1,8
BE1038		Universal bench for fixing animals	pc	1	Frame dimensions about 1 3 0 0 x 1 8 0 0 x 2 0 0 0	WS1,8
BE1039		Stetho-phonendoscope	pc	2	Rubber tube length about 1 m	WS1,8
BE1040		Table for instruments	pc	1	Dimensions (WxLxH) about 4 0 x 6 0 x 8 0 c m	WS1,8
BE1041		Shelf for instruments	pc	1	Steel frame, lock, double-doors	WS1,8
BE1042		Surgery table for big animals with light	set	1	Total length about 2.5 m; total width about 1 . 5 m	WS1,8
BE1043		Surgery table for small animals with light	set	1	Dimensions about 550 x 1500 x 7 5 0 ~ 1 0 0 0 mm (D , W , H)	WS1,8
BE1044		Water heating apparatus with thermostat	pc	1	Tank cap. about 30L; thermostatic temp. control; temp. range max 100 deg C	WS1,8
BE1045		Trocar	pc	5	Three; dia.Φ 5 , 6 , 7 mm	WS1,8
BE1046		Refrigerator	pc	1	Cap. about 350 L or more	WS1,8
BE1047		Centrifuge	pc	1	Max. speed about 5000 r p m; dimensions about 4 5 0 x 4 5 0 x 4 5 0	WS1,8
BE1048		Syringe-injectors in set	set	5	5 in set	WS1,8
BE1049		Electrocardiograph	pc	1	No. of channels: 1 / 2; LCD display; printer: thermal or equiv.	WS1,8
BE1050		Freezer	pc	1	Cap. about 4 0 0 L	WS1,8
BE1051		Electric oven with time switch	pc	1	Plate dimensions about 350 x 250 mm; temp. range about 50 ~ 2 5 0 ° C	WS1,8
BE1052		Cow model for insemination	pc	1	Functions: extracting semen; adjustable height; manual hydraulic operation	WS1,8
BE1053		Model of cow skeleton	pc	1	1/4 scale mode or more 1	WS1,8
BE1054		Model of cow internal organs, muscular	pc	1	Plastic; 10 or more parts	WS1,8
BE1055		Drying chamber	pc	1	Temp. range 5 0 ~ 2 5 0 ° C; cap. about 3 0 L	WS1,9
BE1056		Special instrument for piercing, branding, tattooing of animals	set	1	Set of 3 devices	WS1,9
BE1057		Anemometer	pc	1	3-cup type	WS1,9
BE1058		Gas analyzer	pc	1	Portable; analyzes CO2, NH3, H2S (in air); w/ alarm	WS1,9
BE1059		Hygrometer	pc	1	Measurement range: about -10 to +50 ° C; humidity range 0-100%; power source: battery; recording by pen	WS1,9
BE1060		Goggles	pc	1	Plastic	WS1,9
BE1061		Shedding units for horses, big-horn animals, pigs, dogs	set	1	4 types, for horse, pig, dog, horned animals	WS1,9
BE1062		Pregnancy calendar for agricultural animals	pc	1	Diagram for calculating pregnancy periods	WS1,9
BE1063		Pincers for nose	set	1	Length about 2 4 0 mm	WS1,9
BE1064		Obstetrical loops	pc	1	Large loop & small loop as set	WS1,9
BE1065		Water bath	pc	1	Measurement range: about : + 1 0 ~ 9 5 ° C; cap. about 6 L	WS1,9
BE1066		Syringe catheters in set	pc	1	Catheter set, for rectum-vagina method and forceps method	WS1,9
BE1067		Egg incubator	pc	1	Temp. control by thermostat; cap. 100-120 chick eggs	WS1,9
BE1068		Auto-feeder	pc	1	Drinking bowl with water-release valve operated by nose paddle	WS1,9
BE1069		Feed mixer	pc	1	Tractor-pulled type; required tractor to be 5KW or more, cap. about 8 m3; forage cutting, mixing and feeding	WS1,9

No.	Sub No.	Description	Unit	Q'ty	Main specifications	Location
BE1070		Infra-red lamp with stand	pc	1	Lamp 1 5 0 W x 2 ; lifetime 10,000 hrs or more	WS1,9
BE1071		Ultraviolet lamp with stand	pc	1	Lamp's energy consumption 4 0 0 W	WS1,9
BE1072		Milking machine	pc	1	Vacuum for milking: 3 3 0 ~ 3 5 0 m m n H g ; with device capable of total	WS1,9
BE1073		Wool cutters/shearing device in set with grinders	pc	13	Electric shears	WS1,9
BE2000		7.2 Technology for preservation of agricultural products				
BE2002		Inspection conveyor	pc	1	Motor output 90W; belt width 600 m m ; length 9m; belt of polyurethane	WS2,5
BE2003		Vegetable slicer	pc	1	Motor 0.2 k W ; slicing cap. 250□300kg/h	WS2,5
BE2004		Frying device	pc	1	Exterior dimensions: about W470xD600xH800 m m ; power, 6 k W ; cap. 20-25 croquets/batch	WS2,5
BE2005		Cutting table	pc	3	Exterior dimensions: about W1800xD900xH850 m m	WS2,5
BE2007		Can seamer and bottle capper	pc	1	Candia. 50-103 m m ; can height, 25-180 m m ; cap. 3-4 cans; motor, 0.75 kW for seamer, 2.2kW for pump, 0.4kW for compressor; external dimensions about W1500xD700xH400 m m ; cap tightener	WS2,5
BE2008		Autoclave	pc	2	Dimensions: about dia. 400 x ht 450 m m	WS2,5
BE2009		Kneader	pc	2	Cap : 60L/h	WS2,5
BE2010		Juicer	pc	1	Exterior dimensions: about W275xD260xH660 m m ; power, 1.4 k W ; speed, 13500 r p m (3 speeds); cap. 6L	WS2,5
BE2011		Juice press	pc	1	Hydraulic; cap. 50L, stroke 210 m m , pressure 15Mpa	WS2,5
BE2012		Mark printing machine	pc	1	Manual; exterior dimensions W270xD220xH430 m m	WS2,5
BE2013		Meat chopper	pc	1	Motor, 0.3 k W ; cap. 50kg/h	WS2,5
BE2014		Twin screw mixer	pc	1	Motor, 0.5 k W ; cap. 20kg/time	WS2,5
UT0000		8 Urgut Professional College of Construction and National Handicraft				
UT1000		8.1 Joiner's carpentry and parquet works				
UT1001		Thickness Planer	pc	1	Takes wood w/ max/ dimensions about W 600mm x thickness 300mm solid-state speed control	WS,5
UT1002		Wood Lathe	pc	1	Takes length up to about 1000mm; clearance from head about 250mm	WS,5
UT1003		Jointer	pc	1	Takes widths up to about 300mm	WS,5
UT1004		Tenon Cutting Machine	pc	1	Max. tenon dimensions about W 100mm x H 400mm x L 300mm	WS,5
UT1005		Saw Sharpening Machine	pc	1	Sharpens blades up to about 400mm dia.	WS,5
UT1006		Mortising Machine	pc	1	Takes lumber up to about 200mm wide, 200mm thick	WS,5
UT1007		Portable Circular Saw	pc	1	Blade dia. about 180mm	WS,5
UT1008		Router Machine	pc	1	Takes lumber up to about 140mm thick; distance jig to frame about 600mm	WS,5
UT1009		Electric Floor Sander	pc	1	Belt sander for floors; sanding width about 250mm; w/ dust collector	WS,12
UT1010		Electric Floor Planer	pc	1	Rough finishing of floors; polishing width about 250 mm ; w/ dust collector	WS,5
UT1011		Electric Floor Polisher	pc	1	Rotating brush type; polishes about 300mm width	WS,5
UT1012		Belt Sander	pc	1	Flat type; sanding width about 2,000mm	WS,12
UT1013		Pedestal Grinder	pc	1	Stone dia. about 200mm	WS,12
UT1014		Portable Electric Planer	pc	1	Width plane surface about 130mm	WS,5
UT1015		Circular Saw	pc	1	Blade about 400mm dia.	WS,5
UT1016		Spray Gun with Air Compressor	set	1	Operates using compressed air; compressor cap. about 600 lit/min; operates at about 0.9MPa	WS,12
UT1017		Lacquer Sprayer	set	1	Compressed air	WS,5
UT1018		Radial Saw	pc	1	Blade dia. about 400mm; arm swings about +45 deg to -45 deg, tilts about 45	WS,5
UT1019		Saw Blade Set	set	1	Blades for radial saw	WS,12
UT1020		Carpentry Tools Set	set	1	Carpenter's tools, incl. hammer, screwdriver, pliers etc.	WS,5
UT1021		Hand Saw	pc	13	Saw for plywood	WS,5
UT1022		Wood Chisel Set	set	13	Set of 9 chisels	WS,5
UT1023		Jack Plane	pc	13	Jack plane w/ blade width about 50mm	WS,5
UT1024		Smoothing Plane	pc	13	50mm blade-width smoothing plane	WS,5
TA0000		9. Tashkent Technologic Professional College				
TA1000		9.1 Food processing (bread, sweets, macaroni, confectionary)				
TA1003		Screening machine of flour and sugar	pc	1	Exterior dimensions: about 270xH100 m m ; mesh size 12; passes 2.00mm	WS,2F,11
TA1006		Kneader for dough	pc	2	Stainless bowl inside dia. about 410mm; depth 410m; cap. 50L; 4-speed (108, 205, 283, 365 rpm); exterior dimensions about W752xD840xH1321 m m ; energy consumption 1.2kW	WS,2F,11
TA1008		Dividing and making roll dough machine	pc	1	Exterior dimensions: about W830xD570xH1540 m m ; makes 30 pieces, energy consumption 1.1kW	WS,2F,11
TA1012		Bakery oven	pc	1	Exterior dimensions: about W1330xD1070xH1800 m m ; shelves, 6; energy consumption 15kW	WS,2F,10
TA1013		Macaroni extruder and formation machine	pc	1	Exterior dimensions: about W450xD800xH1200 m m ; cap. 14-16kg/ h ; energy consumption 1.2 k W	WS,2F,10
TA1028		Molder	pc	1	Exterior dimensions: about W1130xD510xH1160 m m ; cap. 2400 pces/h; energy consumption : 0.29 k W	WS,2F,4
TA1030		Grinding mill for recovery product	pc	1	Exterior dimensions: about W435xD320xH1030 m m ; tank cap. 18L; energy consumption : 0.4 k W	WS,2F,4
TA1031		Bakery oven for cookie	pc	1	Exterior dimensions: about W600xD720xH1540 m m ; 3 shelves; energy consumption 3.4kW	WS,2F,4
TA1032		Kneader for macaroni dough	pc	1	Stainless bowl inside dia. 360 m m ; depth 365 m m ; cap.; speed 144、 246、 313、 442 r p m (4 speeds) ; exterior dimensions: about W675xD765xH1278 m m ; energy consumption 0.75kW	WS,2F,4
TA1033		Cutting machine for wafer	pc	1	Cap. 750W; exterior dimensions about W600xD1365xH1255 m m	WS,2F,4
TA1034		Press machine for cookie	pc	1	Exterior dimensions: about W720xD560xH1100 m m ; cap. 1800 pces/h; energy consumption 0.4 k W	WS,2F,4
TA1036		Mixer for viscous materials	pc	1	Energy consumption 250W; cap. 5L	WS,2F,5
TA1038		Éclair formative machine	pc	1	Exterior dimensions: about W2320xD880xH1760 m m ; energy consumption :	WS,2F,5

No.	Sub No.	Description	Unit	Q'ty	Main specifications	Location
TA1039		Kneader for biscuit and cream	pc	1	Exterior dimensions: about W240xD375xH348 mm; bowl cap. 7L; energy consumption 650W	WS,2F,5
TA1041		Emulsion-mixer for batter and wafer paste	pc	1	Stainless bowl inside dia. 410 mm; depth 410 mm; cap. 50L; speed 108、205、283、365 r p m (4 speeds); exterior dimensions about W752xD840xH1321 mm; energy consumption 1.5kW	WS,2F,5
TA1042		Waffle baker	pc	1	Exterior dimensions: about W510xD465xH180 mm; energy consumption	WS,2F,5
TA1043		Coating machine for paste	pc	1	Hopper cap. 15L; speed 100rpm; air pressure 15Mpa or more	WS,2F,5
TA1044		Bakery fermentation box	pc	1	Exterior dimensions about W1030xD890xH1930 mm; 20 shelves; energy consumption 1.2kW	WS,2F,6
TA1047		Automatic twist-wrapping machine for cookies and wafers	pc	1	Machine dimensions W2600 x D2200 x H1060mm; wt. about 700Kg; cap. max. 400 pces/min	WS,2F,7
TA1048		Macaroni dryer	pc	1	Exterior dimensions: about W1600xD1500xH2400 mm; temp. and humidity	WS,2F,7
TA1049		Reverse sheet	pc	1	Exterior dimensions: about W2300xD650xH1055 mm; cap.2-3 k g、energy consumption : 0.4kW	WS,2F,7
TA2000		9.2 Operation and maintenance of equipment for food production				
TA2001		Air separator	pc	1	Exterior dimensions: about W500xD710xH1450 mm、access opening 110mm; w/ separator	WS,1F,7
TA2002		Vibration separator	pc	1	Exterior dimensions: about W1486xD950xH1305 mm; screen, 495 x 958mm; weight 340kg; cap. 15 t / h	WS,1F,7
TA2003		Disk cleaner for grain	pc	1	Exterior dimensions: about W1905xD880xH1360 mm; cap. 3-6 t / h; motor, 5.5 k W; speed 1000-1300rpm, suction 5-6M3/min	WS,1F,7
TA2006		Magnetic separator	pc	1	Exterior dimensions: about W448xD400xH580 mm	WS,1F,7
TA2007		Grain flow meter	pc	1	Cap: 10 t / h; std. measurement range 200 k g / h -11 t / h; precision 1/100-	WS,1F,7
TA2008		Dosing mechanism for grain	pc	1	Cap: 10 t / h	WS,1F,7
TA2009		Wet grain pilling machine	pc	1	Cap: 4-8 t / h	WS,1F,7
TA2010		Polishing machine for grain	pc	1	Exterior dimensions: about W1260xL2500xH1250 mm; wind force 40m3/min; motor, 0.75kw x 6p	WS,1F,7
TA2011		Sieving machine for grain	pc	1	Exterior dimensions: about W646xD646xH1290mm; sieve area 1.4m2; number of stage 2-4	WS,1F,7
TA2013		Peeler machine	pc	1	Exterior dimensions: about W1316xD700xH1420mm; speed 1500rpm; req. horsepower 3.7kW; cap.700kg/h	WS,1F,7
TA2014		Bucker.	pc	1	Exterior dimensions: about W770xD620xH1050 mm	WS,1F,5
TA2015		Mixer for fodders	pc	1	Exterior dimensions: about W920xD920xH1200 mm; cap. 180 L; 90 ~ 120kg; drum depth 450mm	WS,1F,5
TA2016		Roller mill	pc	1	Speed 3000 r p m; motor 15kw; wind generated 27m3/min,	WS,1F,4
TA2017		Threshing machine	pc	1	Cap: 60 k g / h; rotation ratio 61 : 100; hopper cap. 1kg; motor 250 W	WS,1F,5
CM0000		10. Common Equipment for 9 Professional Colleges				
CM0001		Overhead Projector	pc	9	Halogen lamp, 300W; screen size x 3.5- x 10	9 PC
CM0002		Video camera (handy type)	pc	9	PAL video signal; pixels 800,000; effective pixels 400,000	9 PC
CM0003		LCD projector with screen	set	9	1700 lumens; basic pixel no. SVGA; screen 2 x 1.5m	9 PC
CM0004		Video Authorization System	set	9	Nonlinear editing M P E G 2	9 PC
CM0007		Mini bus (24 seater)	pc	9	Gasoline engine 4000 C C 2 8 seats	9 PC
C00000		11. IDSSVE				
F00000		11.3 IDSSVE (Faculty)				
F10000		11.3.1 Server section				
F10001		Proxy/Mail Server	pc	1	P4; 2 G H z ; cache 512 K B ; memory 512 M B ; 15-inch TFT; hard disk 100GB; software: Linux, Internet software, Samba	3F,9
F10002		Fire Wall /DNS Server	pc	1	P4; 2 G H z ; cache 512 K B ; memory 512 M B ; 15-inch TFT; hard disk 100 G B ; software: Linux, Internet software, Samba	3F,9
F10003		Network Computer	pc	1	P4; 2 G H z ; cache 512 K B ; memory 512 M B ; 15-inch TFT; hard disk 100 GB; software: Windows Office	3F,9
F10005		UPS	pc	3	Cap. 1500 V A	3F,9
F10006		Laser printer	pc	1	A3; monochrome 22 ppm; resolution 1200 dpi	3F,9
F10008		HUB A	pc	1	4 port router; 24 port switching hub; 100 M b p s	3F,9
F10009		HUB B	pc	9	12 port hub 100 M b p s	1F,24,25,2F,24/3 F,5,7,9,10,23
F10010		Modem	pc	2	56 k b p s	3F,9
F30000		11.3.3 Chair of information				
F30001		Computer	pc	2	Notebook; P4; 1.6 G H z ; memory 128 M B ; 14-inch TFT; hard disk 20 G B Windows XP, Office; FDD: CD-ROM	3F,21
F30005		Scanner	pc	1	A4 2400dpi	3F,21
F30006		Color Printer	pc	1	A3 color 22 ppm; resolution 2400 dpi	3F,21
F40000		11.3.4 Chair of professional methods				
F40001		Computer	pc	1	Notebook; P4 1.6 G H z or equiv., memory 128 M B , 14 inch TFT, hard disk 20 G B Windows XP, Office; FDD CD-ROM	3F,10
F40002		Laser printer	pc	1	A3 monochrome 22 ppm; resolution 1200 dpi	3F,10
F50000		11.3.5 Chair of pedagogic and				
F50001		Computer	pc	1	Notebook; P4;1.6 G H z , memory 128 M B 14 inch TFT hard disk 20 G B Windows XP, Office; FDD CD-ROM	3F,16
F50002		Laser printer	pc	1	A3 monochrome 22 ppm resolution 1200 dpi	3F,16
F60000		11.3.6 Chair of economy and				
F60001		Computer	pc	1	Notebook; P4;1.6 G H z , memory 128 M B 14 inch TFT hard disk 20 G B Windows XP, Office; FDD CD-ROM	4F,10
F60002		Laser printer	pc	1	A3 monochrome 22 ppm; resolution 1200 dpi	4F,10
F70000		11.3.7 Chair of public subjects				
F70001		Computer	pc	1	Notebook; P4;1.6 G H z memory 128 M B 14 inch TFT hard disk 20 G B Windows XP, Office; FDD CD-ROM	4F,12
F70002		Laser printer	pc	1	A3 monochrome 22 ppm; resolution 1200 dpi	4F,12

No.	Sub No.	Description	Unit	Q'ty	Main specifications	Location
F80000		11.3.8 Class Rooms(5)				
F80003		Multimedia Projector with Screen	set	3	1700 lumens; basic pixel no. SVGA; screen 2 x 1.5 m	3F,11,17,22
F80004		OHP	pc	3	Halogen lamp 300W; screen size x 3.5- x 10	3F,11,17,22
F80005		Video Eye	pc	3	1/2 inch C C D 470 x 350line	3F,11,17,22
F80007		Blackboard	pc	5	1.8m x 0.9m	3F,11,17,22 4F,11,13
F80008		Stand Board	pc	3	1.2m x 0.8m	3F,11,17,22
F90000		11.3.9 Conference Hall(150 seats)				
F90005		Audio Video Set for Hall	set	1	Amp 300 w; mixer, cassette C D / D V D ; speaker; microphone	Hall
F90012		Video Camera	pc	1	P A L ; 800,000 pixels; effective pixels 400,000	Hall
FA0000		11.3.10 Digitalized Library				
FA0001		Server Computer	pc	1	P 4 2 G H z cache 512 K B ; memory 512 M B 15 inch TFT hard disk 102 G B Widows Office	2F,24
FA0002		Computer	pc	1	P 4 1.8-2 G H z memory 256 M B 15 inch TFT hard disk 40-50 G B Windows XP Office; video editing	2F,24
FA0003		UPS	pc	2	Cap. 1500 V A	2F,24
FA0004		Laser Printer	pc	1	A 3 color 22 p p m resolution 2400 d p i	2F,24
FA0005		Multimedia Projector with Screen	set	1	1700 lumens; basic pixel no. SVGA screen size 2 x 1.5 m	2F,24
FA0007		Copy Machine A3	pc	1	A3 monochrome copies 16cpm; zoom 50 %-200%	2F,24
FA0010		TV and Video set	set	1	29 inch color TV video tape recorder	2F,24
FA0011		Video Camera	pc	1	P A L ; 800,000 pixels; effective, 400,00 pixels	2F,24
FA0014		Black Board	pc	1	1.8m x 0.9m	2F,24
FA0015		Stand Board	pc	1	1.2m x 0.8m	2F,24
FB0000		11.3.11 Mini Printing Room				
FB0010		Copy Machine A3	pc	1	A3 monochrome copies; 16cpm; zoom 50 %-200%	1F,27
FC0000		11.3.12 Printing House				
FC1000		The shop of preprinting prepare				
FC1100		Designer Section				
FC1101		Server Computer	pc	1	P 4 2 G H z cache 512 K B memory 512 M B 15 inch TFT hard disk 102 G B ; Windows XP Office	1F,24
FC1102		Computer	pc	2	P 4 1.8-2 G H z memory 512 M B 15 inch TFT hard disk 40-50 G B Windows XP Office	1F,24
FC1103		UPS	pc	3	Cap. 1500 V A	1F,24
FC1107		Scanner Plane-table	pc	1	Resolution 20-20,000 dpi effective size 330x 530 m m 32bitCMYK 48bit RGB scan speed 1 1msec/line	1F,24
FC1108		Printer for color testing	pc	1	A1 color; resolution monochrome 600dpi; color, 600dpi speed 50m2/h	1F,24
FC1110		Laser Printer A4	pc	1	A4 color 16 ppm resolution 2400 dpi	1F,24
FC1111		Printer Color A3	pc	1	A3 color 22 ppm; resolution 2400 dpi	1F,24
FC1200		Section of computer composition				
FC1201		Computer	pc	3	P 4 1.8-2 G H z memory 512 M B 17 inch TFT hard disk 40-50 G B Windows X P Office editing software	1F,24
FC1202		UPS	pc	3	Cap. 1500 V A	1F,24
FC1205		Assembled Table	pc	1	1.0 m x 0.7 m light table	1F,24
FC2000		The shop of printing				
FC2100		Section of making forms				
FC2101		Film Printer (Imagesetter)	pc	1	Resolution 1,000-3,000dpi width 254 m m-609 m m	1F,25
FC2102		Film Processor	pc	1	Resolution 1,000-3,000dpi width 254 m m-610 m m	1F,25
FC2103		PS Plate Printer	pc	1	Effective burn area 850 x 1130 m m; automatic exposure control	1F,25
FC2104		PS Plate Processor	pc	1	Roller type; processing width 250-620 m m; processing length 350-745 m m; processing thickness 0.12-0.24 m m; processing speed 1.0 0 0 m m / min	1F,25
FC2105		Assembled Table	pc	1	1.0 m x 0.7 m light table	1F,25
FC2200		Section of Printing				
FC2201		Printing Machine, Full Color	pc	1	A2 2-color; speed 4000-12000 S P H	1F,26
FC2202		Printing Machine, One Color	pc	1	A3 monochrome; speed 3000-9000 S P H	1F,27
FC2205		Digital Printer A3	pc	1	A3; color; speed 6 0 - 1 2 0 sheets/min; resolution 600dpi	1F,27
FC3000		Post-printing shop				
FC3001		Folding Machine, Big	pc	1	Max. sheet size 660x1100mm; 16 folded sheets A4- A6	1F,27
FC3004		Select Machine for writing books	pc	1	Collating speed 2000 sheets/hr; setting ht. 50 m m; 2 sections	1F,28
FC3006		Thread Sewing Machine	pc	1	Speed 45-110 r p m; sewing width 19m m 23.5 m m; sheet size 128-65 m m to 410-275 m m	1F,28
FC3007		Wire Sewing Machine	pc	1	Sheet thickness max. 20m m; wire, 0.8 m m-0.41 m m.	
FC3010		Thermo binding Machine	pc	1	Speed 1000 vols/hr; max. vol. thickness 55 m m	1F,28
FC3012		1-knife Cut Machine for big sheets	pc	1	Cutting width 1100 m m; cutting speed 40 strokes/min	1F,27
FC4000		Special equipment				
FC4001		Measuring equipment	set	1	Densitometer 0-2.5 D ; dot range 0%-100% ; reproduction precision 0.01 D precision 0.02 D	1F,25
FC5000		Additional equipment				
FC5001		Small cart(2), tables, chairs, shelves	lot	1	Humidifer for printing room 35 sq m; w/ hygrometer	1F,26
FD0000		11.3.13 For retraining on information technology				
FD1000		Laboratory of new information technology				
FD1001		Server Computer	pc	1	P 4 2 G H z ; cache 512 K B ; memory 512MB; 15 inch TFT ; hard disk 102 G B ; software, Windows Office	3F,7
FD1002		Computer	pc	4	P 4 1.8-2 G H z ; memory 256 M B ; 15 inch TFT ; hard disk 40-50 G B ; Windows XP, Office, video editing	3F,7
FD1004		UPS	pc	5	Cap. 1500 V A	3F,7
FD1005		(Network equipment)				3F,7
FD1006		Computer (Notebook type)	pc	2	Notebook, P4; 1.6 G H z ; memory 128 M B ; 14 inch TFT ; hard disk 20-30 G B ; Windows XP ; Office	3F,7

No.	Sub No.	Description	Unit	Q'ty	Main specifications	Location
FD1007		Scanner A3	pc	1	A3 2400dpi	3F,7
FD1009		Laser Printer, Color	pc	1	A3; color; 16 ppm; resolution 2400 dpi	3F,7
FD1012		CD-ROM (Writer)	pc	2	× 12 C D re-write available OK	3F,7
FD1016		Multimedia Projector	pc	1	1700 lumens; basic pixel no. SVGA; screen 2 × 1.5m	3F,7
FD1026		TV and Video set	pc	1	29 inch color TV video tape recorder	3F,7
FD1028		Video Tape Recorder, Digital	pc	1	Digital; PAL; I E E 1394 interface	3F,7
FD1029		Audio Tape Recorder	pc	1	4-track, 2-channel stereo	3F,7
FD1030		Video Camera, Digital	pc	2	PAL video signal; 800,000 pixels; effective pixels 400,000	3F,7
FD1031		Photo Camera, Digital	pc	2	3,000,000 pixels; 1/2.7 inch C C D	3F,7
FD1033		CD & DVD player	pc	1	Signal method P A L / N T S C	3F,7
FD1036		Fax Machine	pc	1	G3 P P C fax	3F,7
FD2000		(Specialized Classrooms (2))				
FD2001		Computer/Server Windows	pc	1	P4; 2GHz; cache 512 K B ; memory 512MB; 15 15 inch TFT; hard disk 102GB; software Windows Office	3F,5/23
FD2002		Computer/Work Station	pc	13	P4 1.8-2 G H z memory 256M B 15 inch TFT hard disk 40-50 G B Windows XP Office	3F,5/23
FD2003		UPS	pc	14	Cap. 1500 V A	3F,5/23
FD2004		Laser printer	pc	1	A3; monochrome 22 ppm; resolution 1200 dpi	3F,5/23
FD2007		Multimedia Projector	pc	1	1700 lumens; basic pixel no. SVGA; screen 2 × 1.5m	3F,5/23
FD2008		OHP	pc	1	Halogen lamp 300W; screen size × 3.5- × 10	3F,5/23
FD2009		Video Eye	pc	1	1/2 inch C C D 470 × 350line	3F,5/23
FD2010		Black Board	pc	1	1.8m x 0.9m	3F,5/23
FD2011		Stand Board	pc	1	1.2m x 0.8m	3F,5/23

Remarks: For location of equipment, see FIG. 3-21 through FIG. 3-31. Legend:

WS,1 : Workshop room No.1
2F, 3 : Room No.3 on the second floor.
B3, 1F, 3 : Room No.3 on the first floor of Block No.3
EB, 1F, 5 : Room No. 5 on the first floor of Education Block.
WS1,7 : Room No.7 of Workshop No.1

2-2-3 Basic Design Drawings

The principal project sites of this project are as indicated in Table 2-2 and are 10 in number. Plan drawings of the sites are provided as FIGs. 2-11 to 2-20. Locations of the equipment to be supplied are shown in FIGs. 2-21 to 2-31.

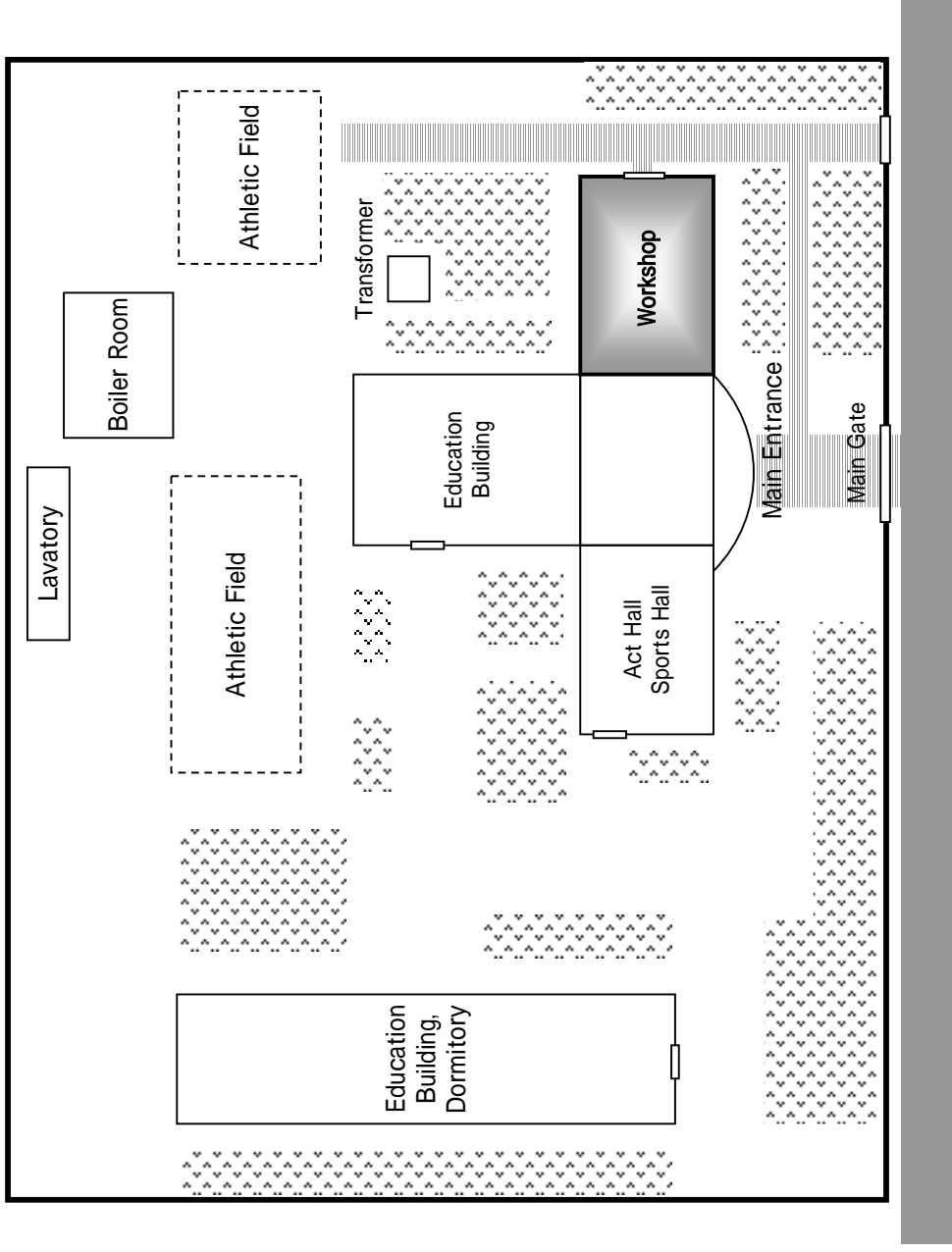


FIG 2-11 Site Map - Nukus Politechnic Professional College

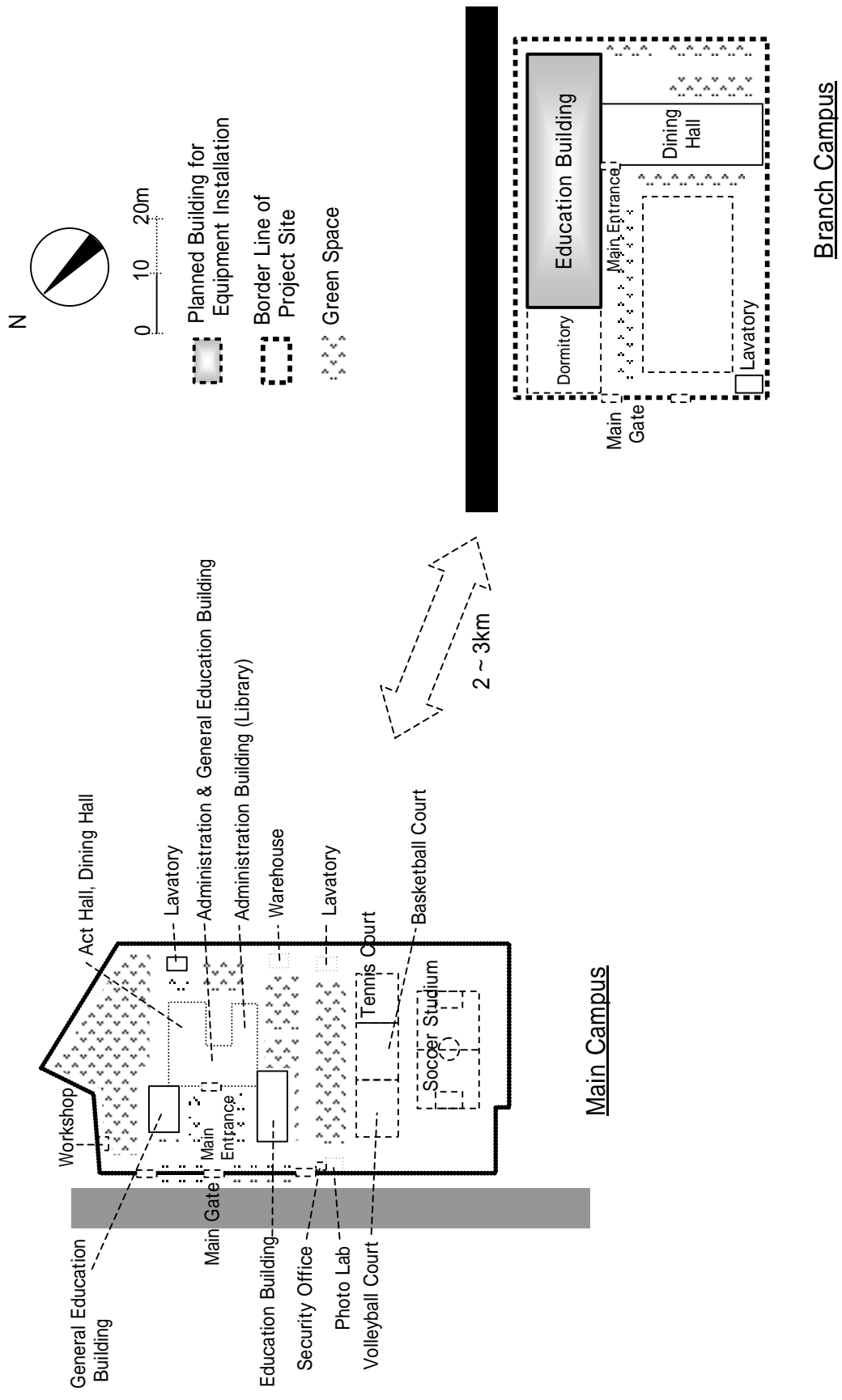


FIG 2-12 Site Map - Urgench Medical Professional College

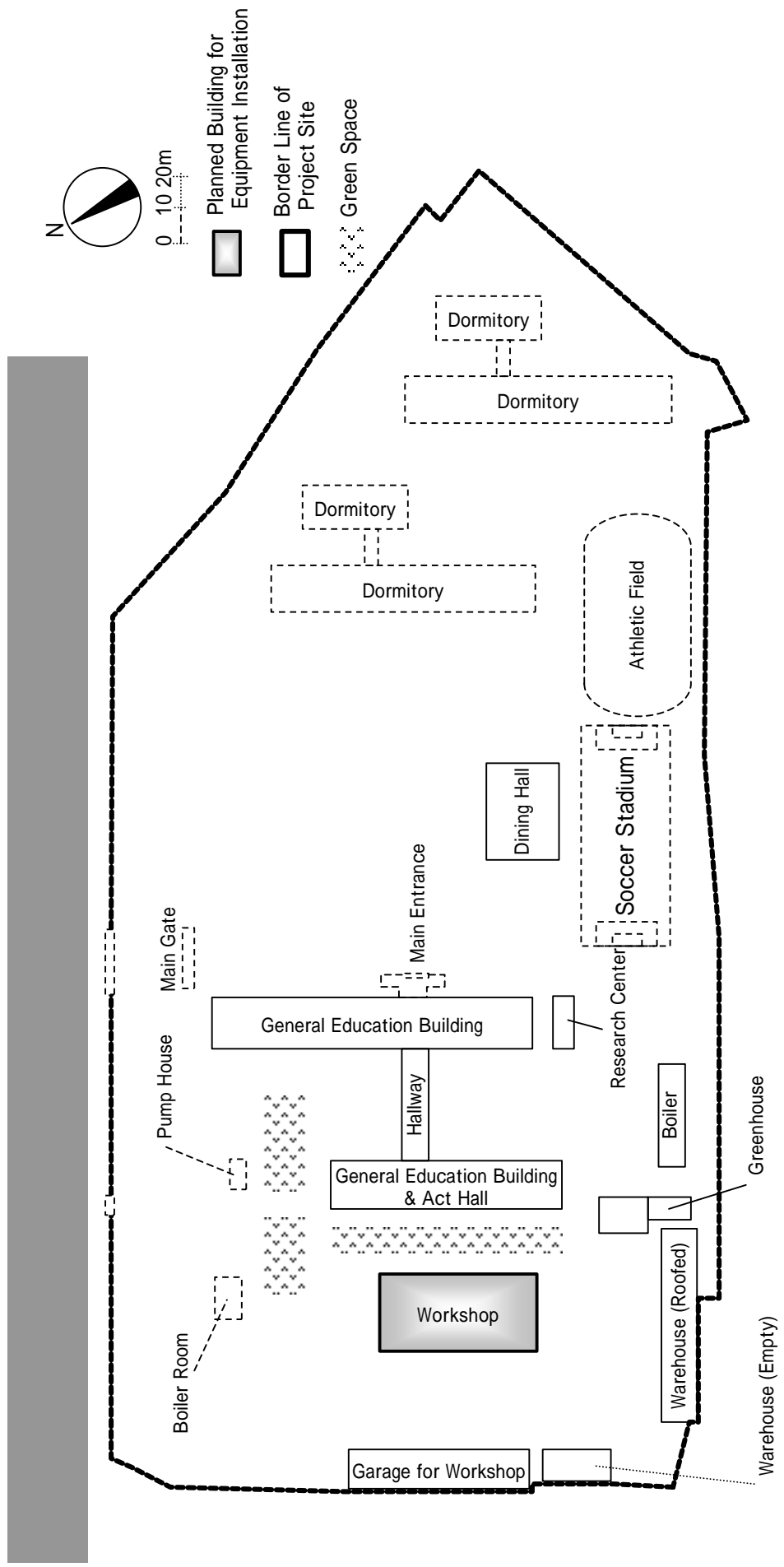


FIG 2-13 Site Map - Namangan Agro-economic Professional College

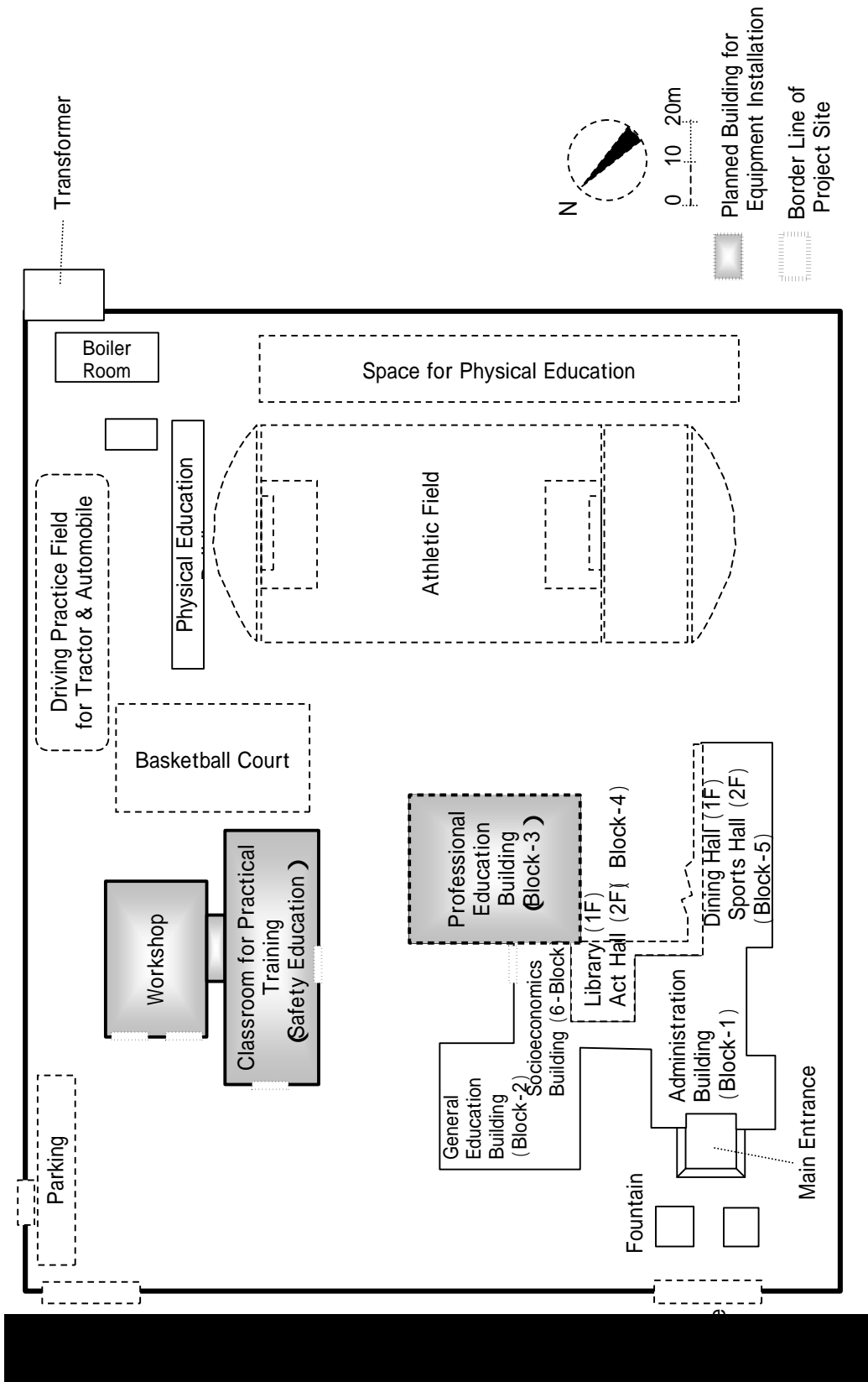


FIG 2-14 Site Map - Asaka Agricultural Professional College

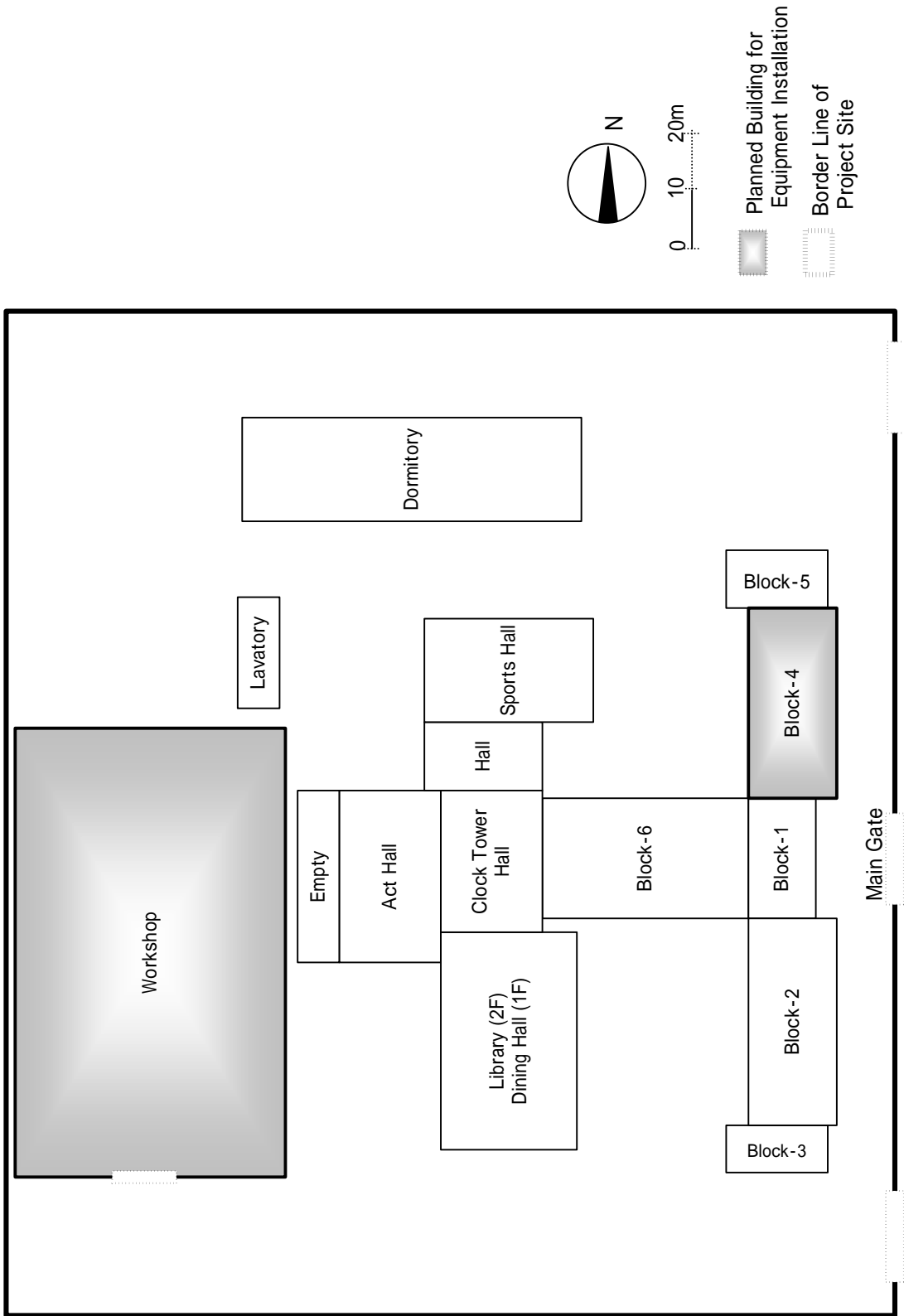


FIG 2-15 Site Map - Kokand Professional College of Human Services

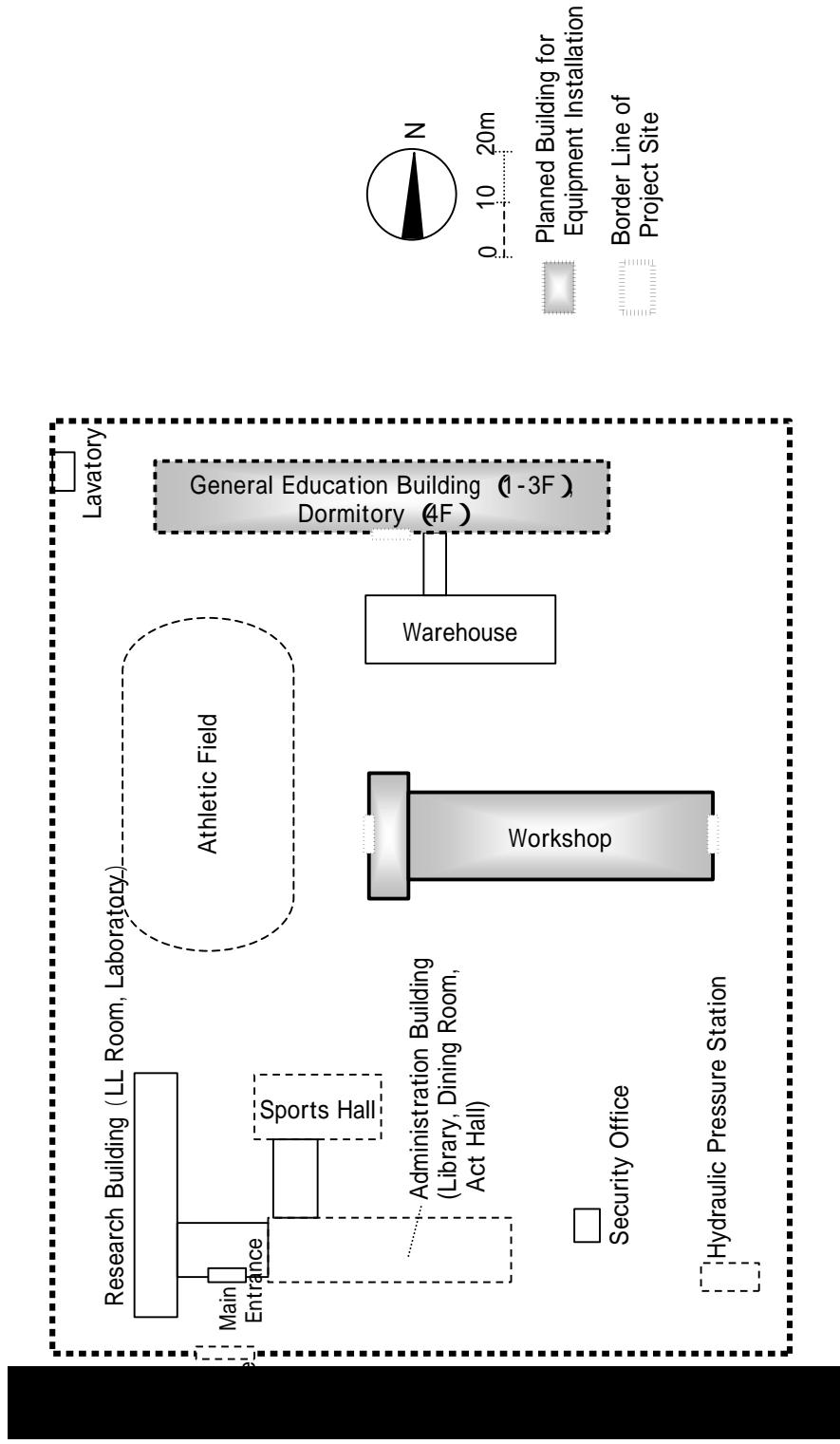


FIG 2-16 Site Map - Bukhara Construction and Municipal Professional College

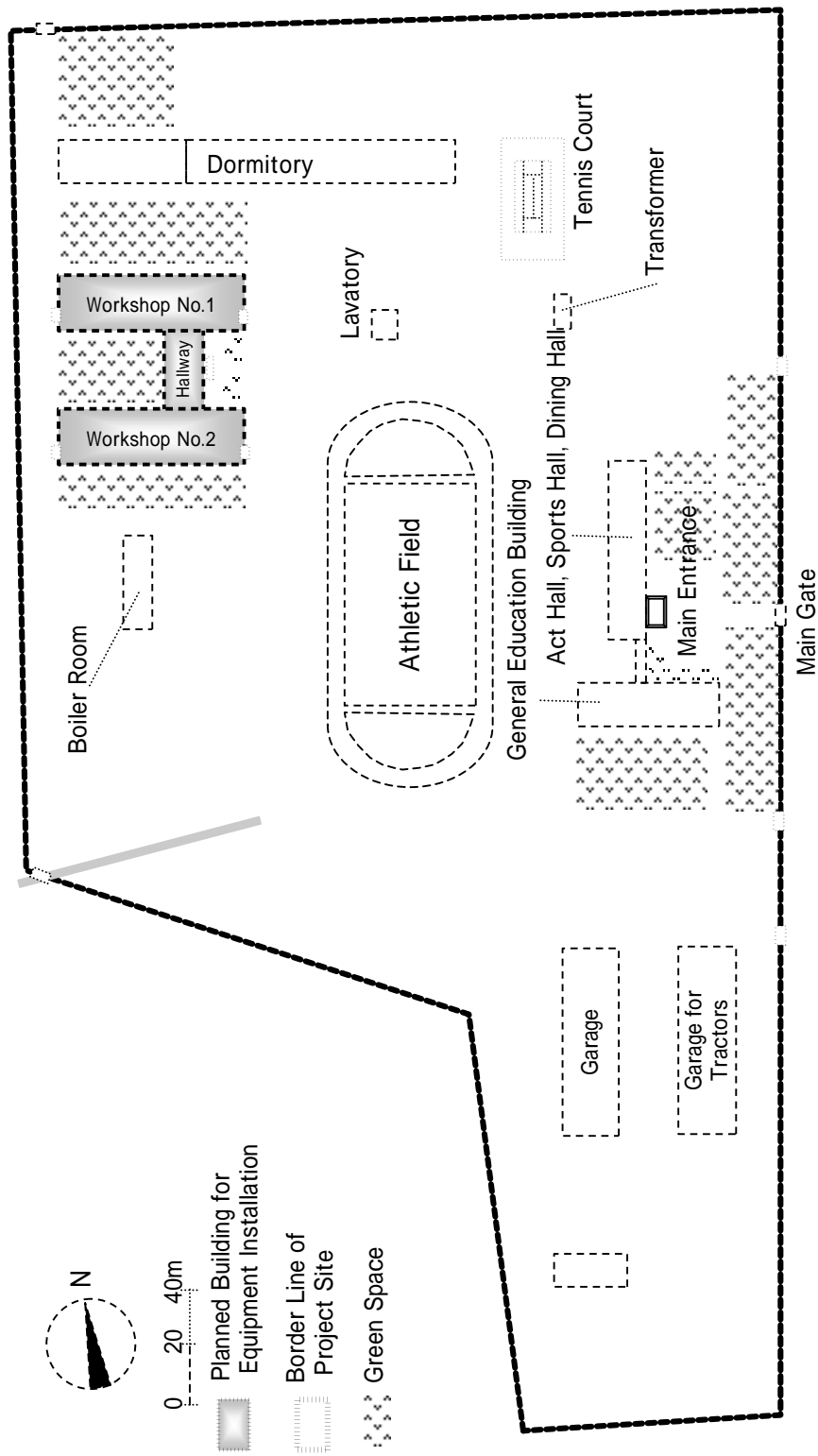


FIG 2-17 Site Map - Beshkent Agricultural Professional College

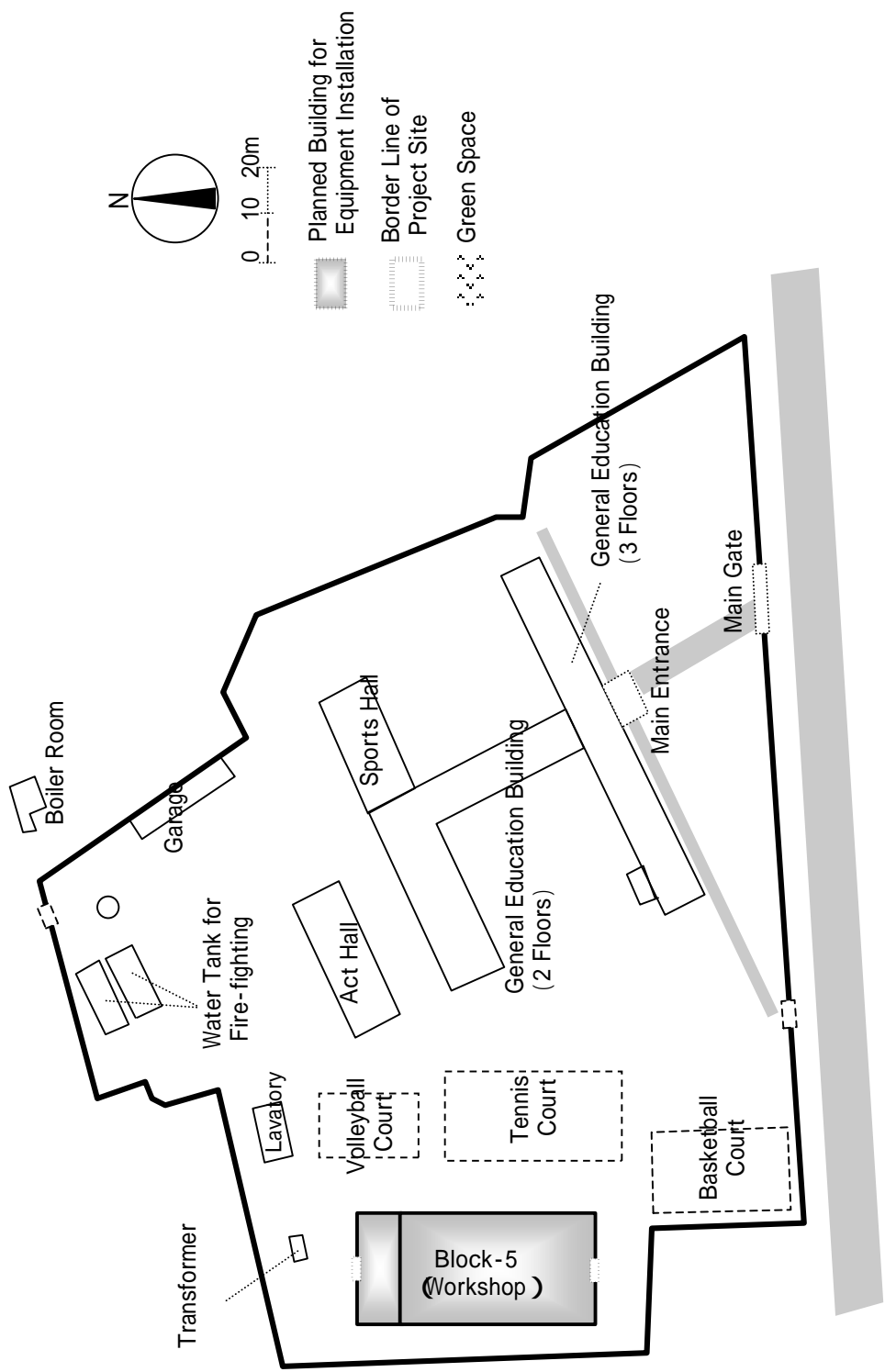


FIG 2-18 Site Map - Urgut Professional College of Construction and National Handicraft

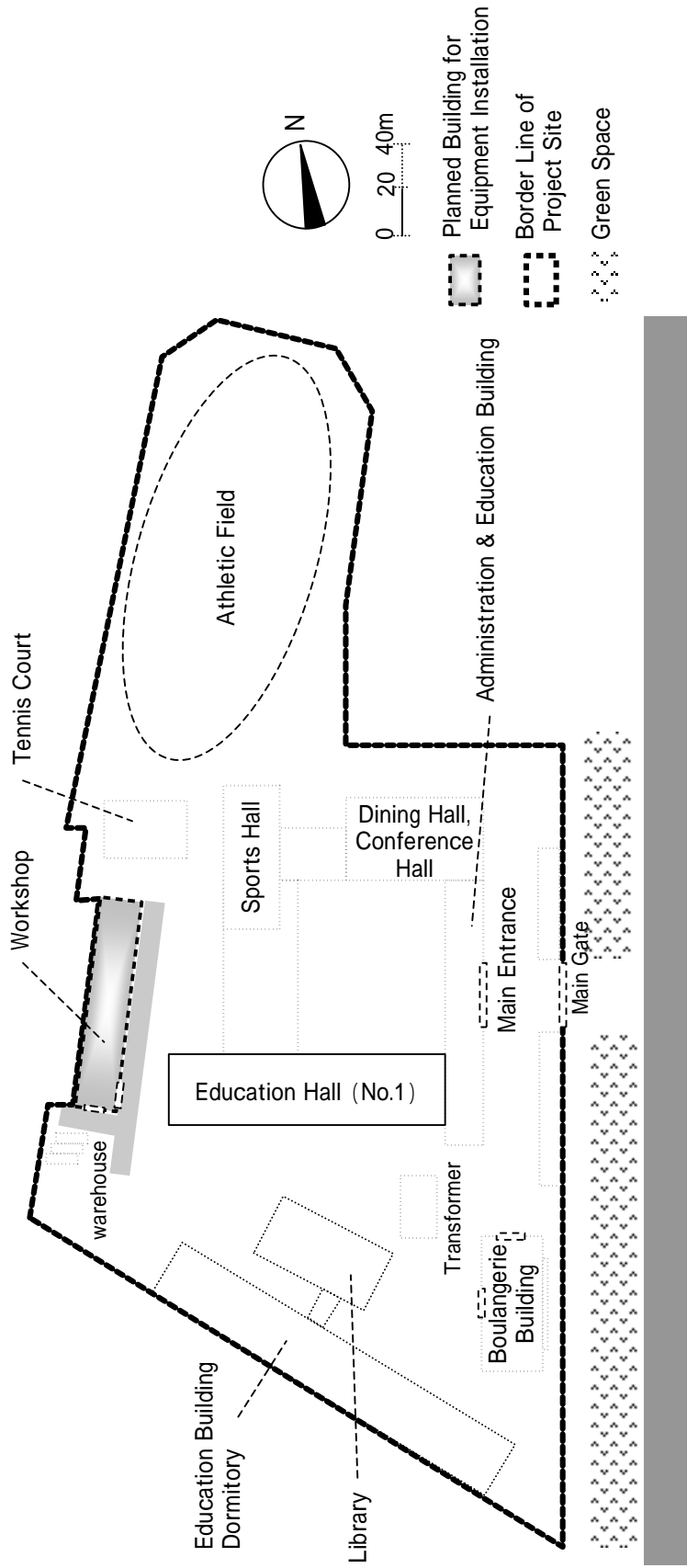


FIG 2-19 Site Map - Tashkent (Mirza Ulugbek) Technologic Professional College

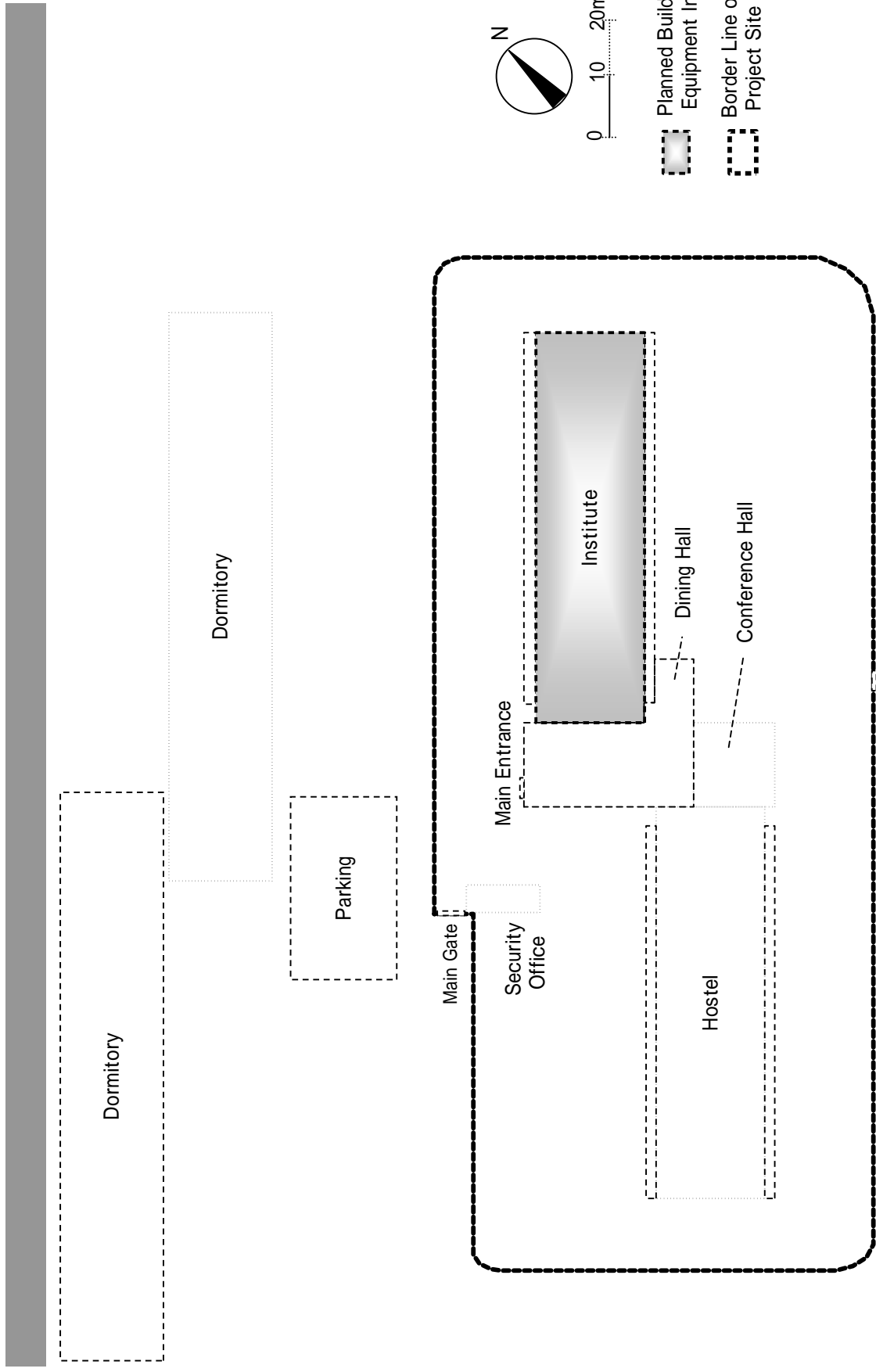


FIG 2-20 Site Map - Institute for Development of Secondary Specialized and Vocational Education (IDSSVE)