

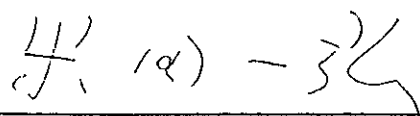
**Minutes of Discussions**  
**on**  
**the Basic Design Study on the Project for**  
**Development of Science and Mathematics Teaching for**  
**Primary and Secondary Education**  
**in**  
**the Republic of Indonesia**  
**(Consultation on Draft Report)**

In August 1998, the Japan International Cooperation Agency (JICA) dispatched the Basic Design Study Team on the Project for Development of Science and Mathematics Teaching for Primary and Secondary Education (hereinafter referred to as "the Project") to the Republic of Indonesia, and through discussions, field surveys, and technical examinations of the results in Japan, prepared a draft Basic Design report of the study .

In order to explain and consult with the Directorate General of Higher Education (DGHE), the Ministry of Education and Culture on the components of the draft report, JICA sent a study team headed by Mr. Kazuhiro Yoneda, Deputy Resident Representative, JICA Indonesia Office and is scheduled to stay in Indonesia from 9 to 19 December, 1998.

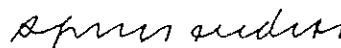
As a result of discussions, both parties confirmed the main items described on the attached sheets.

Jakarta, 18 December, 1998




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Mr. Kazuhiro Yoneda  
 Leader  
 Basic Design Study Team  
 (Consultation of Draft Report)  
 Japan International Cooperation Agency




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Prof. Dr. Bambang Soehendro  
 Director General for  
 Directorate General of Higher Education  
 Ministry of Education and Culture

## ATTACHMENT

### 1. Components of the Draft Basic Design Report

The Directorate General of Higher Education (DGHE), the Ministry of Education and Higher Education have agreed and accepted the components of the draft Basic Design report proposed by the Team.

### 2. Responsible and Executing Organization

The responsible organization of the Project is the Directorate General of Higher Education (DGHE), Ministry of Education and Culture. The executing organization is IKIP Bandung, IKIP Malang, and IKIP Yogyakarta.

The Central Project Implementation Management (CPIU) will be established and take responsibilities to coordinate 3 IKIPs both for the Japanese technical cooperation and for the Grant Aid Project. The Director General for DGHE will chair the CPIU and the office of CPIU will be settled at IKIP Bandung.

The Local Project Implementation Unit (LPIU) will be established at each IKIP under CPIU and take responsibility to coordinate and manage the Japanese technical cooperation and the Grant Aid Project at each IKIP. The Rector of each IKIP will chair the LPIU. The Dean, as a academic coordinator for the implementation of the technical cooperation, and P2T (institution project manager), as a physical coordinator for the implementation of the Grant Aid Project, will support it.

After implementation, each IKIP will be responsible for the maintenance of the building and equipment granted under the Japan's Grant Aid.

### 3. Contents of the Items of the Project

- (1) Both sides have confirmed the contents of building to be constructed under the Japan's Grant Aid Project as per Annex-1.
- (2) Both sides have confirmed the contents of equipment to be provided under the Japan's Grant Aid Project as per Annex-2.

Equipment for chemistry department of IKIP Yogyakarta should be provided if the major construction of new chemistry building is completed by the end of January 1999, and entrance fences (iron fence) for security must be installed by March 1999.

- (3) Details of above mentioned building and equipment should be modified after further study and consultation with Indonesian side and experts of Japanese technical cooperation project.

#### 4. Japan's Grant Aid Programme

DGHE has understood the system and characteristics of Japan's Grant Aid Programme explained in Annex-3 by the Team.

#### 5. Necessary Measures to Be Taken by the DGHE and IKIPs

- (1) On condition that the Grant Aid Programme by the Government of Japan is extended to the Project, DGHE will take the necessary measures described in Annex-4 for smooth implementation of the Project.
- (2) DGHE and each IKIPs should allocate sufficient budget for operation and maintenance of building and equipment as well as teaching and administration staff.
- (3) IKIP Bandung, IKIP Malang and IKIP Yogyakarta should ensure sufficient space for equipment before the installation.
- (4) IKIP Bandung should take the following measures and complete the works by September 1999 (tentative), before the commencement of construction.
  - (a) Ground preparation works such as retaining walls to the northern, western and eastern sides of the site, and grading of southern area (current trash disposal area)
  - (b) Temporary power and water supply for construction
  - (c) Temporary access road for construction
- (5) After the completion of building construction, IKIP Bandung should move all the necessary equipment including those from the existing buildings to new building.

#### 7. Further Schedule of the Study

JICA will complete a final report of the Study in accordance with the confirmed items, and send it to Indonesia by March, 1999.



Annex-1 Contents of Building to be Built under the Japanese Grant Aid Project

A. Laboratories

(1) Mathematics Laboratories

Computer Room :	2 (each for 20 people)
Teaching Secondary / Primary :	2 (each for 20 people)
Lecturers Room :	for 19 lecturers

(2) Physics Laboratories

Basic Physics Laboratory :	1 (for 40 people)
Electronics Laboratories :	1 (for 40 people)
Intermediate / advance Physics Laboratory :	2 (for 80 people)
Earth and Space Science :	1 (for 40 people)
Lecturers Room :	for 19 lecturers

(3) Chemistry Laboratories

Basic Chemistry Laboratory :	1 (for 40 people)
Organic Bio & Food Laboratory :	1 (for 40 people)
Physical / Inorganic Laboratory :	1 (for 40 people)
Analysis Laboratory :	1 (for 40 people)
Instrumental Laboratory :	1 (for 40 people)
Lecturer Room :	for 21 lecturers

(4) Biology Laboratories

General / Plant Structure Laboratory :	1 (for 40 people)
Ecology Laboratory :	1 (for 40 people)
Physiology Laboratory :	1 (for 40 people)
Animal Structure Laboratory :	1 (for 40 people)
Microbiology Laboratory :	1 (for 40 people)
Lecturers Room:	for 21 lecturers

B. General and Common Classroom

Large Classroom :	2 (for 120 people)
Medium Classroom :	1 (for 80 people)
Classroom :	8 (for 40 people)
Small Classroom :	5 (for 20 People)
AVA room :	1
Auditorium :	1
Cafeteria :	1
Curriculatorium :	1
Small Book Store :	1
Room for Pray :	1
Workshop :	1



C. Administration

Dean Office:	1
Assistant Dean Office:	3
Project Management Office:	1
Head & Secretary of Department Office:	4
Experts Room :	1
Faculty Administration Office :	1
Department Administration Office :	4
Seminar & Meeting Room :	4

D. Others

Corridors, Stairs, Lavatories, Storage, Machine Rooms, etc.



**BIOLOGY**

Item	Equipment	Bandung	Yogyakarta	Malang	Total
BI- 1	Dissecting Set	20	24	7	51
BI- 2	Magnifier	16	11	12	39
BI- 3	pH Meter	18	18	12	48
BI- 4	Electrode for pH Meter	50	50	50	150
BI- 5	Do Meter	8	8	5	21
BI- 6	Clinometer	8	8	6	22
BI- 7	Altimeter	8	8	5	21
BI- 8	Lux Meter	6	6	4	16
BI- 9	Barometer	4	4	3	11
BI- 10	Hygrometer	6	6	3	15
BI- 11	Soil Thermometer	9	10	6	25
BI- 12	Wind Meter	1	4	0	5
BI- 13	Rain Gauge	2	2	2	6
BI- 14	Insect Net, 2 kind	13	20	18	51
BI- 15	Plankton Net, 2 kind	5	4	3	12
BI- 16	Hydrometer	8	8	8	24
BI- 17	Max-Min Thermometer	10	10	10	30
BI- 18	Salinity Conductivity Meter	8	8	7	23
BI- 19	Turbidimeter	8	3	8	24
BI- 20	Refractometer	7	8	8	23
BI- 21	Dry Specimen Set of Insect	1	1	1	3
BI- 22	Soil Warm Extractor	8	8	3	19
BI- 23	Sampling Tubes Set with cap	10	10	10	30
BI- 24	Bottles Set for Specimen	10	10	10	30
BI- 25	Sampling Bottle	8	10	10	28
BI- 26	Binocluars	18	20	16	54
BI- 27	Hardness Meter	8	7	8	23
BI- 28	Conductivity Meter	8	8	8	24
BI- 29	Soil Analyzer Kit	8	8	6	22
BI- 30	Gas Analyser	8	8	8	24
BI- 31	Polari-saccharimeter	8	8	8	24
BI- 32	Stopwatch	20	20	14	54
BI- 33	Thermostat Water Bath	3	4	0	7
BI- 34	Centrifuge	3	3	0	6
BI- 35	Kymograph	2	2	0	4
BI- 36	Pneumograph	1	2	2	5
BI- 37	Refrigerator	1	2	2	5
BI- 38	Sphygmomanometer	2	1	0	3
BI- 39	Spirometer	1	2	0	3
BI- 40	Haemocyto Plate Counter	2	4	0	6
BI- 41	Electrocardiograph	2	2	2	6
BI- 42	Algae Slide Set	10	10	10	30
BI- 43	Plankton Slide Set	10	10	10	30
BI- 44	Mold & Fungi Slide Set	10	10	10	30
BI- 45	Bryophyta Slide Set	10	10	10	30
BI- 46	Ferm Spores Slide Set	2	2	2	6
BI- 47	Ferm Sori Slide Set	2	2	2	6
BI- 48	Ferm Prothallium Slide Set	2	2	2	6
BI- 49	Gymnosperm Root Slide Set	2	2	2	6
BI- 50	Gymnosperm Stem Slide Set	2	2	2	6
BI- 51	Gymnosperm Leaf Slide Set	2	2	2	6
BI- 52	Dicotyle Root Slide Set	2	2	2	6

Item	Equipment	Bandung	Yogyakarta	Malang	Total
BI- 53	Dicotyle Stem Slide Set	2	2	2	6
BI- 54	Dicotyle Leaf Slide Set	2	2	2	6
BI- 55	Monocotyle Root Slide Set	2	2	2	6
BI- 56	Monocotyle Stem Slide Set	2	2	2	6
BI- 57	Monocotyle Leaf Slide Set	2	2	2	6
BI- 58	Oven Drier	2	2	0	4
BI- 59	Aspiratory Vacuum Pump	0	1	1	2
BI- 60	Garden Tool Set	2	2	2	6
BI- 61	Desicator	0	6	2	8
BI- 62	Analytical Balance	8	6	0	14
BI- 63	Magnetic Stirrer with hot plate	6	7	3	16
BI- 64	Warburg bath and manometer	1	1	1	3
BI- 65	Autoclave	1	2	0	3
BI- 66	Tripod	10	18	0	28
BI- 67	Retort Stand	10	12	20	42
BI- 68	Steel Stand	10	10	20	40
BI- 69	Student Microscope	15	39	18	72
BI- 70	Stereoc Microscope	14	10	16	40
BI- 71	Binocular Microscope	26	36	40	102
BI- 72	Microscope TV Camera Set	0	1	1	2
BI- 73	Microscope Stereo Trinocular	0	1	1	2
BI- 74	Microscope Repairing Tools	2	2	2	6
BI- 75	Colony Counter	4	6	5	15
BI- 76	Incubator	0	3	4	7
BI- 77	Shaker	8	7	7	22
BI- 78	Blender	8	8	1	17
BI- 79	Chromatography	8	8	6	22
BI- 80	One Cell Animal Slide Set	2	2	2	6
BI- 81	Filaria Slide Set	2	2	2	6
BI- 82	Wet Preservative Set of Invertebrate	1	1	1	3
BI- 83	Vertebrate Organs Slide Set	10	10	10	30
BI- 84	Wet Specimen of Vertebrate	1	1	1	3
BI- 85	Wet Specimen of Vertebrate	1	1	1	3
BI- 86	Micrometer, objective	20	15	11	46
BI- 87	Micrometer, eye piece	40	40	37	117
BI- 88	Rotary Microtome	3	3	2	8
BI- 89	Parafin Specimen App.,	2	2	2	6
BI- 90	Testis Slide Set	10	10	10	30
BI- 91	Ovary Slide Set	10	10	10	30
BI- 92	Mitotic Division Slide Set	10	10	10	30
BI- 93	Frog Development Slide Set	10	10	10	30
BI- 94	Development Stage of Frog	1	1	1	3
BI- 95	Development Stage of Fish Embryo	1	1	1	3
BI- 96	Development Stage of Entomology	1	1	1	3
BI- 97	Development of Seaurchin	1	1	1	3
BI- 98	RNA Protein Synthesis Kit	2	2	2	6
BI- 99	DNA Molecular KIT	1	2	1	4
BI- 100	DNA Gel Electrophoresis	2	2	2	6
BI- 101	Drying Tray for dyeing	0	1	1	2
BI- 102	Mitosis Model	1	1	1	3
BI- 103	Meiosis Model	1	1	1	3
BI- 104	Human Torso	1	1	1	3
BI- 105	Head Model	1	1	1	3
BI- 106	Eye Model	1	1	1	3

Item	Equipment	Bandung	Yogyakarta	Malang	Total
BI- 107	Heart Model	1	1	1	3
BI- 108	Skin Model	1	1	1	3
BI- 109	Kidney Model	1	1	1	3
BI- 110	Pelvis Model	1	1	1	3
BI- 111	Embryo Development Model	1	1	1	3
BI- 112	Pregnancy Model	1	1	1	3
BI- 113	Ovary Model	1	1	1	3
BI- 114	Development Stage of Frog Embryo	1	1	1	3
BI- 115	Comparative Vertebrate Heart Series	1	1	1	3
BI- 116	Comparative Vertebrate Brain Series	1	1	1	3
BI- 117	Root Tip Structure	1	1	1	3
BI- 118	Dicotyle Stem Model	1	1	1	3
BI- 119	Monocotile Stem Model	1	1	1	3
BI- 120	Leaf Model	1	1	1	3
BI- 121	Flower Model	1	1	1	3
BI- 122	Seed Model	1	1	1	3
BI- 123	Plant Model Set	1	1	1	3
BI- 124	Clean Bcnch with UV Lamp	1	1	1	3
BI- 125	Homogenizer	8	8	8	24
BI- 126	Alchol Thermometer	20	20	20	60
BI- 127	Vortex Mixer(Touch mixer)	8	8	8	24
BI- 128	Adjustable Pipette	10	7	10	27
BI- 129	Reciprotating Bath Shaker	2	2	1	5
BI- 130	Spectrophotometer	2	0	1	3
BI- 131	Glassware	1	1	1	3
BI- 132	Chemicals	1	1	1	3
BI- 133	Table for experiment(student)	40	0	0	40
BI- 134	Table for experiment(teacher)	5	0	0	5
BI- 135	Side table for experiment	10	0	0	10
BI- 136	Side table for experiment	5	0	0	5
BI- 137	Side table for experiment	5	0	0	5
BI- 138	Side table for experiment	5	0	0	5
BI- 139	Side table for experiment	5	0	0	5
BI- 140	Chair for student	240	0	0	240
BI- 141	Chair for teacher	5	0	0	5
BI- 142	Chemical cabinet	10	5	5	20
BI- 143	Glassware cabinet	10	5	5	20
BI- 144	Shelf	10	5	5	20
BI- 145	Water Treatment System	1	1	1	3
BI- 146	Exhaust Fan	0	7	10	17
BI- 147	Airconditioner	0	0	1	1
BI- 148	Water Distillation	2	1	2	5



## CHEMISTRY

Item	Equipment	Bandung	Yogyakarta	Malang	Total
CH- 1	Analytical Balance	5	3	3	11
CH- 2	Barometer	5	5	4	14
CH- 3	Bunsen Burner	24	40	0	64
CH- 4	Cork Borer	4	5	5	14
CH- 5	Drying Oven	1	3	3	7
CH- 6	Eudiometer	8	8	8	24
CH- 7	Forceps	8	10	8	26
CH- 8	Funnel Support	6	12	22	40
CH- 9	Mantle Heater	16	2	6	24
CH- 10	Hoffman Apparatus	4	2	0	6
CH- 11	Tube Holder	12	20	10	42
CH- 12	Hygrometer	4	4	4	12
CH- 13	Manometer	8	8	8	24
CH- 14	Periodic Chart	3	4	1	8
CH- 15	Rubber Stopper	30	30	30	90
CH- 16	Standard Support	50	50	50	150
CH- 17	Mercury Thermometer	35	40	40	115
CH- 18	Alcohol Thermometer	40	40	40	120
CH- 19	Tripod	0	83	25	108
CH- 20	Burette Support	41	40	27	108
CH- 21	DC Milli-ammeter	8	8	8	24
CH- 22	pH Meter	8	9	7	24
CH- 23	Electrode for pH Meter	20	20	20	60
CH- 24	Power Source	10	10	7	27
CH- 25	Soldering Iron	3	5	2	10
CH- 26	Stop Watch	20	18	10	48
CH- 27	Electronic Precision Balance	5	6	6	17
CH- 28	Calorimeter	3	4	0	7
CH- 29	Thermostatic Circular Bath	5	5	5	15
CH- 30	Utility Clamp	12	15	15	42
CH- 31	Furnace	4	2	1	7
CH- 32	Pycnometer	10	10	6	26
CH- 33	Magnetic Stirrer	10	10	8	28
CH- 34	Du Noy Surface Tensiometer	4	4	4	12
CH- 35	Colorimeter	2	6	6	14
CH- 36	Conductivity meter	6	8	8	22
CH- 37	Multitester	9	10	10	29
CH- 38	Polarimeter	7	8	6	21
CH- 39	Potentiometer	4	4	4	12
CH- 40	Blender	2	2	2	6
CH- 41	Centrifuge	2	2	2	6
CH- 42	Electrophoresis Apparatus	2	2	1	5
CH- 43	Hot Plate	2	2	3	7
CH- 44	Paper Chromatography	2	1	4	7
CH- 45	Kjeldhal Set	2	2	2	6
CH- 46	Melting Point Apparatus	7	8	6	21
CH- 47	Mechanical Stirrer	4	4	4	12
CH- 48	BOD Meter	2	2	2	6
CH- 49	COD Apparatus	2	2	3	7
CH- 50	Fraction Collector	2	2	2	6
CH- 51	Autoclave/Sterilizer	1	2	0	3
CH- 52	DNA Model	1	1	1	3
CH- 53	Desicator	4	9	9	22

Item	Equipment	Bandung	Yogyakarta	Malang	Total
CH- 54	Top Loading Balance	5	5	4	14
CH- 55	Magnetic Stirrer with hot plate	7	8	6	21
CH- 56	Microscope	6	7	7	20
CH- 57	Molecular Model	1	1	1	3
CH- 58	Stick pH Meter	8	8	5	21
CH- 59	Electrode for pH Meter	20	20	20	60
CH- 60	Refrigerator	3	4	2	9
CH- 61	Rotary Vacuum Evaporator	2	1	1	4
CH- 62	Soxhlet Extraction Apparatus	2	0	2	4
CH- 63	Automatic Regulated Transformer	6	6	6	18
CH- 64	Multi-shaker	2	2	2	6
CH- 65	Refractometer	2	2	2	6
CH- 66	Crystal Model	1	2	1	4
CH- 67	Water Bath with shaker	2	1	2	5
CH- 68	Automatic Titrator	8	8	8	24
CH- 69	Balance with computer	1	1	1	3
CH- 70	Draft Chamber	5	0	0	5
CH- 71	Freeze Dryer	1	1	1	3
CH- 72	FT/IR Spectrophotometer	1	0	0	2
CH- 73	UV/VS Spectrophotometer	1	0	0	1
CH- 74	NMR for Education	1	1	1	3
CH- 75	Ultrasonic Cleaner	2	2	1	5
CH- 76	Water Demineralizator	2	1	2	5
CH- 77	Osmotic Pressure Experiment App.,	2	2	2	6
CH- 78	Beckman's Molecular Weight App.,	2	2	2	6
CH- 79	Spectrophotometer	1	1	0	2
CH- 80	Glassware	1	1	1	3
CH- 81	Chemicals	1	1	1	3
CH- 82	Table for experiment(student)	20	0	0	20
CH- 83	Table for experiment(teacher)	5	0	0	5
CH- 84	Side Table for experiment	15	0	0	15
CH- 85	Side Table for experiment	10	0	0	10
CH- 86	Side Table for experiment	25	0	0	25
CH- 87	Chair for student	200	0	0	200
CH- 88	Chair for teacher	5	0	0	5
CH- 89	Chemical Cabinet	10	5	5	20
CH- 90	Glassware Cabinet	10	5	5	20
CH- 91	Shelf	10	5	5	20
CH- 92	Water Treatment System	1	1	1	3
CH- 93	Exhaust Fan	0	10	10	20
CH- 94	Aircon	0	1	2	3
CH- 95	Water Distillation	2	1	2	5

## MATHEMATICS, COMPUTER, AV EQUIP., T/M PRODUCTION, WORKSHOP

Item	Equipment	Bandung	Yogyakarta	Malang	Total
<b>Mathematics(Practical Room)</b>					
MA- 1	Programmable Calculator	41	41	41	123
MA- 2	Color Graph Calculator	34	41	41	116
MA- 3	OHP Calculator Set	2	2	2	6
MA- 4	Fraction Demonstration Kit	10	10	10	30
MA- 5	Volume Blocks	10	10	10	30
MA- 6	Plane Figure Kit	10	10	10	30
MA- 7	Tangram	10	10	10	30
MA- 8	Blackboard Ruler Set	2	2	2	6
<b>Computer(Computer Room)</b>					
CM- 1	Personal Computer Set	20	0	0	20
CM- 2	Desk & Chair for Student Computer	40	0	0	40
CM- 3	Desk & Chair for Teacher Computer	2	0	0	2
CM- 4	Printer, dotmatrix	0	2	4	6
CM- 5	Printer, laser	1	1	1	3
CM- 6	Printer, color jet	0	1	1	2
CM- 7	Scanner	1	2	0	3
CM- 8	Electric & Cable wiring	2	2	2	6
CM- 11	Computer Projector	1	1	2	4
CM- 12	Software	1	1	1	3
CM- 13	Modem	3	1	1	5
CM- 14	UPS/VR for room	2	4	0	6
CM- 15	UPS/VR	0	10	10	20
CM- 16	Black Curtain	0	2	2	4
CM- 17	Airconditioner	0	2	2	4
CM- 18	Personal Computer	1	1	1	3
<b>Audio Visual</b>					
AV- 1	OHP	1	3	1	5
AV- 2	Slide Projector	4	3	4	11
AV- 3	Screen	4	3	2	9
AV- 4	Video Tape Deck	4	4	4	12
AV- 5	Color Monitor	4	3	3	10
AV- 5	Whiteboard with pen and magnet	0	1	0	1
AV- 7	Black Curtain	0	5	5	10
AV- 8	Black Curtain	0	0	1	1
AV- 9	Portable Sound System	4	4	5	13
AV- 10	Airconditioner	0	0	4	4
AV- 11	Fire Extinguisher	0	28	30	58
<b>Teaching Materials Production</b>					
TP- 1	Video Camera Set	1	1	1	3
TP- 2	Camera Set for Computer	2	2	2	6
TP- 3	VHS Recorder	1	1	1	3
TP- 4	VHS Editing System	1	1	1	3
TP- 5	Video Dubbing System	1	1	1	3
TP- 6	Personal Computer Set with monitor	2	1	1	4
TP- 7	Scanner	1	1	1	3
TP- 8	Color Printer	1	1	1	3
TP- 9	Magnetic Optical Disk Driver	1	1	1	3
TP- 10	CDR	2	1	1	4
TP- 11	Airconditioner	1	1	1	3
<b>Printing Equipment</b>					
PR- 1	Phocopy Machine	1	1	1	3
PR- 2	Printing Machine	1	1	1	3

Item	Equipment	Bandung	Yogyakarta	Malang	Total
PR- 3	Printing Base Production	1	1	1	3
PR- 4	Paper Cutter	1	1	1	3
PR- 5	Book Binding Machine	1	1	1	3
PR- 6	Typewriter	1	1	1	3
<b>Work shop Equipment</b>					
<b>Equipment for Wood and Plastic process</b>					
WS- 1	Electric saw	1	1	1	3
WS- 2	Electric saw (round saw)	1	1	1	3
WS- 3	Electric sander for wood	1	1	1	3
WS- 4	Electric Drill	1	1	1	3
WS- 5	Electric Lathe for wood	1	1	1	3
WS- 6	Electric planer	1	1	1	3
WS- 7	Foamed Plastic Cutter	1	1	1	3
WS- 8	Vice for wood	5	5	5	15
WS- 9	Tool Kit for Plastic Work	5	5	5	15
WS- 10	Tool Kit for Wooden Work	5	5	5	15
<b>Equipment for Metal process</b>					
WS- 11	Metal Turning Lathe	1	1	1	3
WS- 12	Electric drill for Metal	1	1	1	3
WS- 13	Drill set	1	1	1	3
WS- 14	Band Saw	1	1	1	3
WS- 15	Electric Grinder	1	1	1	3
WS- 16	Welder	1	1	1	3
WS- 17	Universal cutter	1	1	1	3
WS- 18	Metal Bender	1	1	1	3
WS- 19	Tap and Dice	5	5	5	15
WS- 20	Vice	5	5	5	15
WS- 21	Tool Kit for Metal Working	5	5	5	15
WS- 22	Measurement set	5	5	5	15
WS- 23	Anvils	5	5	5	15
WS- 24	Work Board	5	5	5	15
<b>Equipment for Glass process</b>					
WS- 25	Burner set for glass process	5	5	5	15
WS- 26	Glass tube cutter	5	5	5	15
WS- 27	File Set	5	5	5	15
<b>Equipment for Electrical work</b>					
WS- 28	Tool Kit for Electric Work	5	5	5	15
WS- 29	Electric Drill	1	1	1	3
WS- 30	Multi tester	5	5	5	15
WS- 31	Multi meter	5	5	5	15
WS- 32	Oscilloscope	2	2	2	6
<b>Common</b>					
WS- 33	Work Bench	5	5	5	15
WS- 34	Vacuum Cleaner	1	1	1	3

## PHYSICS

Item	Equipment	Bandung	Yogyakarta	Malang	Total
PH- 1	Air Table for Dynamics	6	6	6	18
PH- 2	Bunsen Burner	3	3	5	11
PH- 3	Dynamic Cart with Track	6	4	3	13
PH- 4	Electric Turntable Set	5	6	6	17
PH- 5	Electronic Precision Balance	6	5	1	12
PH- 6	Experimentatl App., of Second Law of Motion	5	6	5	17
PH- 7	Experimental App., for First Law of Motion	5	6	5	16
PH- 8	Experimental App., for Hook's Law	5	6	6	17
PH- 9	Experimental Spring Set	5	6	6	17
PH- 10	Free Fall Experimental Apparatus	6	5	6	17
PH- 11	Gyroscope with stand base	2	2	2	6
PH- 12	Helical Spring Pendulum Set	6	6	6	18
PH- 13	Hydrometer	6	3	3	12
PH- 14	Jolly Balance	6	6	6	18
PH- 15	Kater's Reversible Pendulum Set	2	2	2	6
PH- 16	Pendulum for Resonance	6	4	6	16
PH- 17	Pulley Set	6	6	6	18
PH- 18	Screw Gauge Micrometer	6	10	10	26
PH- 19	Spring Balance Set	5	0	6	11
PH- 20	Spring Pendulum Set	6	6	6	18
PH- 21	Stop Clock, LED	5	6	6	17
PH- 22	Stroboscope	5	5	6	16
PH- 23	Vernir Caliper	3	8	0	11
PH- 24	Weight Set for Spring	6	6	0	12
PH- 25	Optical Bench Set	5	6	3	14
PH- 26	Coil for Magnetizing	5	3	6	14
PH- 27	Lead Wire Set, more than 10 pcs.,	4	6	6	16
PH- 28	Diffraction Grating Prism	6	1	0	7
PH- 29	Du Noy Surface Tension Meter	6	6	6	18
PH- 30	$\epsilon/m$ Experimental Apparatus	5	6	4	15
PH- 31	Elasticity of Flexure Apparatus	6	6	6	18
PH- 32	Electric Current -Magnetic Field Measuring Apparatus	6	6	6	18
PH- 33	Electromagnetic Force Demonstrator	6	6	6	18
PH- 34	Electronic Digital Counter	3	6	6	15
PH- 35	Eudiometer	6	6	6	18
PH- 36	Experimental App. 'of Critical Angle of Liquid	4	4	6	14
PH- 37	Experimental App., of Boyle-Charles' Law	6	5	6	17
PH- 38	Faraday's Effect App.,	6	6	6	18
PH- 39	Galvanometer	3	0	1	4
PH- 40	Light Velocity Measuring Apparatus	6	6	3	15
PH- 41	Linear Expansion Apparatus	6	6	6	18
PH- 42	Magnetic Circuit Training App.,	2	2	2	6
PH- 43	Mercury Tongs	6	6	5	17
PH- 44	Michelson Interferometer	5	6	5	16
PH- 45	Polar-Sacchari Meter Set	6	6	6	18
PH- 46	Polarizing Plate	6	6	6	18
PH- 47	Power Source	20	20	20	60
PH- 48	Revolving Magnetic Field Apparatus	6	6	6	18
PH- 49	Semiconductor Laser Oscillator	6	6	6	18
PH- 50	Sonometer	6	6	6	18
PH- 51	Stepdown Transformer	5	5	0	10
PH- 52	Thermometer	4	6	6	16
PH- 53	Thermometer	4	1	6	11

Item	Equipment	Bandung	Yogyakarta	Malang	Total
PH- 54	Vacuum Pump	2	1	2	5
PH- 55	Variety of Lens	5	7	6	18
PH- 56	Viscosity Measuring Equipment	6	6	5	17
PH- 57	Water Calorimeter	5	6	2	13
PH- 58	XY Recorder	2	2	2	6
PH- 59	Amplifier	5	6	6	17
PH- 60	Analog Auto Measuring Apparatus(with 2 circuits)	1	1	1	3
PH- 61	Basic Logic Circuit Trainer Panel	2	2	2	6
PH- 62	Circuit Trainer	2	2	2	6
PH- 63	Condenser Circuit Experimental Apparatus	2	2	2	6
PH- 64	Coulomb Meter	5	6	5	17
PH- 65	Counter Circuit	6	6	6	18
PH- 66	Digital Circuit Tester	6	6	6	18
PH- 67	Diode Set	5	6	6	17
PH- 68	Electronic Circuit Experimental Apparatus	2	2	2	6
PH- 69	Electrostatic Fields Apparatus Set	5	6	6	17
PH- 70	Equipotential Experimental Set	6	6	6	18
PH- 71	Experimental App., for Coulomb's Law	5	6	5	16
PH- 72	Experimental App., for Parallel Plate Capacitor	6	6	6	18
PH- 73	Experimental App., of Ohm's Law	6	6	6	18
PH- 74	Frank-Hertz Apparatus	4	5	6	15
PH- 75	Function Generator	6	2	6	14
PH- 76	Gauss Meter	6	6	5	17
PH- 77	Hall Effect Experimental Set	3	4	2	9
PH- 78	High Frequency Circuit Trainer	2	2	2	6
PH- 79	LCR Bridge	2	2	2	6
PH- 80	Logic Circuit Experimental Apparatus	2	2	2	6
PH- 81	Low Frequency Oscillator	4	0	6	10
PH- 82	Lux Meter	6	5	5	16
PH- 83	Main Voltage Wave Observing Apparatus	2	2	2	6
PH- 84	Milikan's Elementary Charge App.,	1	2	2	5
PH- 85	Oscillation Circuit Experimental Apparatus	2	2	2	6
PH- 86	Oscilloscope	6	0	0	6
PH- 87	Photoelectric Effect Demonstrator	6	6	6	18
PH- 88	Potentiometer	6	6	5	17
PH- 89	Regulated Power Supply	6	4	3	13
PH- 90	Resistance Box	6	6	0	12
PH- 91	Semiconductors Element Experimental Apparatus	6	6	6	18
PH- 92	Thermo Electromotive Force Measuring App.,	6	6	6	18
PH- 93	Transistor Set	6	6	6	18
PH- 94	Personal computer for PH-60	1	1	1	3
PH- 95	Wheatstone Bridge	5	5	4	15
PH- 96	Archimedes' Principle Demonstration Device	2	2	2	6
PH- 97	Astronomical Telescope	1	0	1	2
PH- 98	CCD camera & monitor	1	0	1	2
PH- 99	Spectrometer	2	2	2	6
PH- 100	Spectroscope	2	2	2	6
PH- 101	Reading Microscope	6	6	6	18
PH- 102	Reading Telescope	6	6	6	18
PH- 103	DC Voltmeter	6	6	6	18
PH- 104	DC Ammeter	6	6	6	18
PH- 105	Micro Ammeter	6	6	6	18
PH- 106	Induction Coil	6	6	6	18
PH- 107	Regulated DC Power Supply	6	6	6	18

Item	Equipment	Bandung	Yogyakarta	Malang	Total
PH- 108	Integrating Wattmeter	2	2	2	6
PH- 109	Table for Experiment(student)	42	0	0	42
PH- 110	Table for Experiment(teacher)	3	0	0	3
PH- 111	SideTable for experimet	3	0	0	3
PH- 112	SideTable for experimet	8	0	0	8
PH- 113	SideTable for experimet	56	0	0	56
PH- 114	SideTable for experimet	2	0	0	2
PH- 115	SideTable for experimet	2	0	0	2
PH- 116	SideTable for experimet	10	0	0	10
PH- 117	Chair for student	200	0	0	200
PH- 118	Chair for teacher	3	0	0	3
PH- 119	Shelf	16	6	6	28
PH- 120	Airconditioner	0	3	1	4
PH- 121	Black Curtain	0	1	1	2




1. Grant Aid Procedures

1) Japan's Grant Aid Program is executed through the following procedures.

- Application (A request made by the recipient country)
- Study (Basic Design Study conducted by JICA)
- Appraisal & Approval (Appraisal by the Government of Japan and Approval by the Cabinet of Japan)
- Determination of Implementation (Exchange of Notes between the Governments of Japan and the recipient country)

2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study) using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Programme, based on the Basic Design Study Report prepared by JICA, and the results are then submitted to the Cabinet for an approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and recipient country.

Finally, for the implementation of the project, JICA will assist the recipient country in such matters as preparing tenders, contract and so on.

2. Basic Design Study

1) Contents of the study

The aim of the Basic Design Study (hereafter referred to as "the Study") conducted by JICA on a requested project (hereafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Government of Japan. The contents of the Study are as follows :

- a) Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.



- b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
- c) Confirmation of items agreed on by both parties concerning the basic concept of the Project.
- d) Preparation of a basic design of the Project.
- e) Estimation of costs of the Project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of the Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

## 2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA select (a) firm(s) based on proposals submitted by interested firms. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA.

The consultant firm(s) used for the Study is(are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

## 3. Japan's Grant Aid Scheme

### 1) Grant Aid

The Grant Aid Programme provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

3) Period

"The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed.

However, in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

4) Purchase of the Products and or Services

Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country.

However, the prime contractors, namely, consulting constructing and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

5) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

6) Undertakings required of the Government of the Recipient Country

(As described in Annex-4)

7) Proper Use

The recipient country is required to maintain and use the facilities constructed and the equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

8) Re-export

The products purchased under the Grant Aid should not be re-exported from the recipient country.

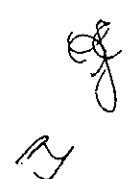
9) Banking Arrangements (B/A)

- a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
- b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.



Following necessary measures should be taken by the Indonesian side on condition that the Grant Aid by the Government of Japan is extended to the Project:

1. To provide data and information necessary for the Project
2. Following items should be secured for the Project site for construction.
  - a) To prepare the land for the Project and secure the rights to build a building.
  - b) To secure reasonably leveled site for the Project prior to the project implementation.
  - c) To construct retaining wall between the project site and adjacent land, if necessary.
  - d) To provide proper access road to the project site.
  - e) To undertake incidental outdoor works, such as landscaping, fencing, exterior lighting, and other incidental facilities in and around the Project site.
  - f) To provide facilities for distribution of electricity, water supply, telephone, drainage, sewage and other incidental facilities into the Project site.
3. Following items should be secured for the existing building for equipment installation.
  - a) To complete the relocation of the existing equipment, facilities and civil works required prior to the installation of the equipment.
  - b) To provide facilities for distribution of electricity, water supply, telephone, drainage, sewage and other incidental items required for the installation of equipment.
4. To allocate appropriate budget and teaching and administrative staff members for proper and effective operation and maintenance of buildings provided under the Grant Aid.
5. To bear commissions to the Japanese bank for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to Pay" and payment commission.
6. To ensure prompt unloading, tax exemption, customs clearance at the port of disembarkation and prompt internal transportation therein of the materials and equipment for the Project purchased under the Grant Aid.
7. To exempt Japanese juridical and physical nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Indonesia with respect to the supply of the products and services under the verified contracts.
8. To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the Indonesia and stay therein for the performance of their work in accordance with the relevant laws and regulations of the Republic of Indonesia.
9. To provide necessary permissions, licenses and other authorizations for implementing the Project, if necessary.



10. To maintain and use properly and effectively the facilities constructed under the Project in responsibility of the DGHE and 3IKIPs.
11. To bear all the expenses, other than those to be borne by the Japan's Grant Aid within the scope of the Project.



## Curriculum Biology Education S1 (Pre-service)

No	Subjects	Credit	Theory	Practice
	<b>General Subjects</b>			
1.	Pancasila Education	2	2	-
2.	Religion Education	2	2	-
3.	Education for National Resilience	2	2	-
4.	<i>Sports</i>	1	1	-
5.	<i>Arts</i>	1	1	-
6.	<i>Seminar on Religion Education</i>	2	2	-
7.	Environmental, Social, Culture and Technology Education	2	2	-
8.	Community Development Program	2	2	-
9.	<i>Indonesia Language</i>	2	2	-
10.	<i>English</i>	2	2	-
	<b>Subtotal</b>	<b>18</b>	<b>18</b>	<b>-</b>
	<b>Pedagogical Subject</b>			
	<b>a. General Pedagogy</b>			
11.	Student Development and Guidance	3	3	-
12.	Introduction of Education	3	3	-
13.	Educational Management	3	3	-
14.	Curriculum and Instructions	3	3	-
	<b>b. Specific Pedagogy</b>			
15.	Foundation of Science Education	2	2	-
16.	Teaching and Learning Strategy (Biology)	4	3	1
17.	Educational Evaluation (Biology)	4	4	-
18.	Teaching Planning (Biology)	3	2	1
19.	<i>Educational Research</i> (Biology)	3	3	-
20.	Student Teaching	4	4	-
	<b>Subtotal</b>	<b>30</b>	<b>28</b>	<b>2</b>
	<b>Basic Science</b>			
13.	General Biology	3	2	1
14.	Basic Chemistry I	4	3	1
15.	Basic Chemistry II	4	3	1
16.	Calculus I	3	3	-
17.	Calculus II	3	3	-
18.	Environmental Science	3	3	-
19.	Fundamental of Physics I	4	3	1
20.	Fundamental of Physics II	4	3	1
	<b>Subtotal</b>	<b>28</b>	<b>23</b>	<b>5</b>

No	Subjects	Credit	Theory	Practice
	<b>Subject Matter</b>			
21.	Plant Morphology	3	2	1
22.	Laboratory Technique	2	-	2
23.	Animal Structure	3	2	1
24.	Invertebrate Zoology	3	2	1
25.	Plant Anatomy	3	2	1
26.	Capita Selecta of High School Biology I	3	3	-
27.	Cryptogamic Botany	3	2	1
28.	Entomology * (Elective)	3	2	1
29.	<i>Fundamental of Computer (Elective)</i>	2	1	1
30.	Biochemistry	3	2	1
31.	<i>Basic Statistics</i>	3	3	-
32.	Vertebrate Zoology	3	2	1
33.	Plant Physiology	3	2	1
34.	Animal Physiology	3	2	1
35.	Capita Selecta of High School Biology II	2	2	-
36.	Genetics	3	2	1
37.	Phanerogamae	3	2	1
38.	Embriology	3	2	1
39.	Microbiology	3	2	1
40.	Plant Ecology	3	2	1
41.	Cell Biology	2	2	-
42.	<i>Applied Biology</i>	3	2	1
43.	Animal Ecology	3	2	1
44.	Evolution	2	2	-
45.	Human Anatomy and Physiology	3	2	1
46.	Nutrition * (Elective)	2	2	-
47.	Animal Behavior * (Elective)	2	2	-
48.	<i>Seminar on Biology</i>	3	3	-
49.	Final Paper ** (Elective)	6	6	-
50.	Thesis ** (Elective)	6	6	-
	<b>Subtotal</b>	<b>80</b>	<b>59</b>	<b>21</b>
	<b>Grand Total</b>	<b>156</b>	<b>128</b>	<b>28</b>

*Italic = Local contents, Normal = National contents*

**Curriculum Chemistry Education S1 (Pre-service)**

No	Subjects	Credit	Theory	Practice
	<b>General Subjects</b>			
1.	Pancasila Education	2	2	-
2.	Religion Education	2	2	-
3.	Education for National Resilience	2	2	-
4.	<i>Sports</i>	1	1	-
5.	<i>Arts</i>	1	1	-
6.	<i>Seminar on Religion Education</i>	2	2	-
7.	Environmental, Social, Culture and Technology Education	2	2	-
8.	Community Development Program	2	2	-
9.	<i>Indonesia Language</i>	2	2	-
10.	<i>English</i>	2	2	-
	<b>Subtotal</b>	<b>18</b>	<b>18</b>	<b>-</b>
	<b>Pedagogical Subject</b>			
	<b>a. General Pedagogy</b>			
11.	Student Development and Guidance	3	3	-
12.	Introduction of Education	3	3	-
13.	Educational Management	3	3	-
14.	Curriculum and Instructions	3	3	-
	<b>b. Specific Pedagogy</b>			
15.	Foundation of Science Education	2	2	-
16.	Teaching and Learning Strategy (Chemistry)	4	3	1
17.	Educational Evaluation (Chemistry)	4	4	-
18.	Teaching Planning (Chemistry)	3	2	1
19.	<i>Educational Research (Chemistry)</i>	3	3	-
20.	Student Teaching	4	4	-
	<b>Subtotal</b>	<b>30</b>	<b>28</b>	<b>2</b>
	<b>Basic Science</b>			
21.	General Biology	3	2	1
22.	Basic Chemistry I	4	3	1
23.	Basic Chemistry II	4	3	1
24.	Calculus I	3	3	-
25.	Calculus II	3	3	-
26.	Environmental Science	3	3	-
27.	Fundamental of Physics I	4	3	1
28.	Fundamental of Physics II	4	3	1
	<b>Subtotal</b>	<b>28</b>	<b>23</b>	<b>5</b>



No	Subjects	Credit	Theory	Practice
	<b>Subject Matter</b>			
29.	<i>Mathematics for Chemistry</i>	3	2	1
30.	Analytical Chemistry I	4	3	1
31.	Modern Physics	3	3	-
32.	Inorganic Chemistry I	3	2	1
33.	Physical Chemistry I	4	4	-
34.	Physical Chemistry Laboratory I	1	-	1
35.	Secondary School Chemistry	4	4	-
36.	Statistics	2	2	-
37.	Inorganic Chemistry II	3	2	1
38.	<i>Introduction to Computer</i>	3	1	2
39.	Physical Chemistry II	4	4	-
40.	Physical Chemistry Laboratory II	1	-	1
41.	Organic Chemistry I	3	3	-
42.	Organic Chemistry Laboratory I	2	-	2
43.	Analytical Chemistry II	3	2	1
44.	Organic Chemistry II	3	3	-
45.	Organic Chemistry Laboratory II	2	-	2
46.	Chemical Bonding	3	3	-
47.	<i>Environmental Chemistry (Elective)</i>	2	1	1
48.	<i>Food Chemistry (Elective)</i>	2	1	1
49.	Instrumental Analytical Chemistry	3	2	1
50.	Biochemistry	4	4	-
51.	Biochemistry Laboratory	1	-	1
52.	Organic Chemistry III	2	2	-
53.	Inorganic Chemistry III	2	2	-
54.	<i>Industrial Chemistry</i>	3	3	-
55.	Radiochemistry	2	2	-
56.	<i>Seminar on Chemistry</i>	2	2	-
57.	Final Project	6	6	-
58.	Thesis (Elective)	6	6	-
	<b>Subtotal</b>	<b>80</b>	<b>63</b>	<b>17</b>
	<b>Grand Total</b>	<b>156</b>	<b>132</b>	<b>24</b>

*Italic = Local contents, Normal = National contents*

**Curriculum Physics Education S1 (Pre-service)**

No	Subjects	Credit	Theory	Practice
	<b>General Subjects</b>			
1.	Pancasila Education	2	2	-
2.	Religion Education	2	2	-
3.	Education for National Resilience	2	2	-
4.	<i>Sports</i>	1	1	-
5.	<i>Arts</i>	1	1	-
6.	<i>Seminar on Religion Education</i>	2	2	-
7.	Environmental, Social, Culture and Technology Education	2	2	-
8.	Community Development Program	2	2	-
9.	<i>Indonesia Language</i>	2	2	-
10.	<i>English</i>	2	2	-
	<b>Subtotal</b>	<b>18</b>	<b>18</b>	<b>-</b>
	<b>Pedagogical Subject</b>			
	<b>a. General Pedagogy</b>			
11.	Student Development and Guidance	3	3	-
12.	Introduction of Education	3	3	-
13.	Educational Management	3	3	-
14.	Curriculum and Instructions	3	3	-
	<b>b. Specific Pedagogy</b>			
15.	Foundation of Science Education	2	2	-
16.	Teaching and Learning Strategy (Physics)	4	3	1
17.	Educational Evaluation (Physics)	4	4	-
18.	Teaching Planning (Physics)	3	2	1
19.	<i>Educational Research</i> (Physics)	3	3	-
20.	Student Teaching	4	4	-
	<b>Subtotal</b>	<b>30</b>	<b>28</b>	<b>2</b>
	<b>Basic Science</b>			
21.	General Biology	3	2	1
22.	Basic Chemistry I	4	3	1
23.	Basic Chemistry II	4	3	1
24.	Calculus I	3	3	-
25.	Calculus II	3	3	-
26.	Environmental Science	3	3	-
27.	Fundamental of Physics I	4	3	1
28.	Fundamental of Physics II	4	3	1
	<b>Subtotal</b>	<b>28</b>	<b>23</b>	<b>5</b>

No	Subjects	Credit	Theory	Practice
	<b>Subject Matter</b>			
29.	Electronics I	3	2	1
30.	Fundamental of Statistic	3	3	-
31.	Computer	3	1	2
32.	Mechanics	4	4	-
33.	Electronics II	3	2	1
34.	Physical Mathematics I	4	4	-
35.	Physical Mathematics II	4	4	-
36.	Electrical Measurement Equipment	2	2	-
37.	Selected Topic on School Physics I	2	2	-
38.	Selected Topic on School Physics II	2	2	-
39.	Electricity and Magnetism	4	4	-
40.	Thermodynamics	3	3	-
41.	Waves	3	3	-
42.	Optics	2	2	-
43.	<i>Laboratory of School Physics</i>	2	-	2
44.	Modern Physics	4	3	1
45.	Physics Laboratory I	2	-	2
46.	Physics History	2	2	-
47.	<i>Statistical Physics</i>	3	3	-
48.	<i>Science of the Earth and the Universe</i>	3	3	-
49.	Physics Laboratory II	2	-	2
50.	Quantum Physics	3	3	-
51.	Solid State Physics	3	3	-
52.	<i>Nuclear Physics</i>	3	2	1
53.	<i>Physics Seminar</i>	3	3	-
54.	Qoloqium*	6	6	-
55.	Thesis*	6	6	-
	<b>Subtotal</b>	<b>80</b>	<b>68</b>	<b>12</b>
	<b>Grand Total</b>	<b>156</b>	<b>137</b>	<b>19</b>

*Italic = Local contents, Normal = National contents*

**Curriculum Mathematics Education S1 (Pre-service)**

No	Subjects	Credit	Theory	Practice
	<b>General Subjects</b>			
1.	Pancasila Education	2	2	-
2.	Religion Education	2	2	-
3.	Education for National Resilience	2	2	-
4.	<i>Sports</i>	1	1	-
5.	<i>Arts</i>	1	1	-
6.	<i>Seminar on Religion Education</i>	2	2	-
7.	Environmental, Social, Culture and Technology Education	2	2	-
8.	Community Development Program	2	2	-
9.	<i>Indonesia Language</i>	2	2	-
10.	<i>English</i>	2	2	-
	<b>Subtotal</b>	<b>18</b>	<b>18</b>	<b>-</b>
	<b>Pedagogical Subject</b>			
	<b>a. General Pedagogy</b>			
11.	Student Development and Guidance	3	3	-
12.	Introduction of Education	3	3	-
13.	Educational Management	3	3	-
14.	Curriculum and Instructions	3	3	-
	<b>b. Specific Pedagogy</b>			
15.	Foundation of Science Education	2	2	-
16.	Teaching and Learning Strategy (Mathematics)	4	3	1
17.	Educational Evaluation (Mathematics)	4	4	-
18.	Teaching Planning (Mathematics)	3	2	1
19.	<i>Educational Research</i> (Mathematics)	3	3	-
20.	Student Teaching	4	4	-
	<b>Subtotal</b>	<b>30</b>	<b>28</b>	<b>2</b>
	<b>Basic Science</b>			
21.	General Biology	3	2	1
22.	Basic Chemistry I	4	3	1
23.	Basic Chemistry II	4	3	1
24.	Calculus I	3	3	-
25.	Calculus II	3	3	-
26.	Environmental Science	3	3	-
27.	Fundamental of Physics I	4	3	1
28.	Fundamental of Physics II	4	3	1
	<b>Subtotal</b>	<b>28</b>	<b>23</b>	<b>5</b>

No	Subjects	Credit	Theory	Practice
	<b>Subject Matter</b>			
29.	Selected Topic of High School Mathematics	4	4	-
30.	Calculus III	3	3	-
31.	Real Analysis I	3	3	-
32.	Real Analysis II	3	3	-
33.	Complex Analysis	3	3	-
34.	Vector Analysis	3	3	-
35.	An Introduction to The Principle of Mathematics	3	3	-
36.	Number Theory	2	2	-
37.	Matrix Algebra	2	2	-
38.	Linear Algebra	3	3	-
39.	Linear Programming	3	3	-
40.	Abstract Algebra I	3	3	-
41.	Abstract Algebra II	3	3	-
42.	Analytic Geometry	3	3	-
43.	Transformation Geometry	3	3	-
44.	Basic Statistics	3	3	-
45.	Mathematical Statistics I	3	3	-
46.	Mathematical Statistics II	3	3	-
47.	Differential Equations	3	3	-
48.	Initial Value and Boundary Condition Problem	3	3	-
49.	Numerical Analysis	3	2	1
50.	Computer Programming	4	2	2
51.	Discrete Mathematics	3	3	-
52.	<i>Seminar on Mathematics</i>	3	3	-
53.	Thesis (**)	6	6	-
54.	An Introduction to Topology (*)	3	3	-
55.	System of Geometry (*)	3	3	-
	<b>Subtotal</b>	<b>80</b>	<b>77</b>	<b>3</b>
	<b>Grand Total</b>	<b>156</b>	<b>146</b>	<b>10</b>

*Italic = Local contents, Normal = National contents*

**Curriculum Biology Education S1 (In-service)**

No	Subjects	Credit	Theory	Practice
	<b>General Subjects</b>			
1.	Community Development Program	2	2	-
	<b>Subtotal</b>	<b>2</b>	<b>2</b>	<b>0</b>
	<b>Pedagogical Subject</b>			
	<b>a. General Pedagogy</b>			
		-	-	-
	<b>b. Specific Pedagogy</b>			
2	Selected Topics of Secondary School Biology I	3	-	-
3	Selected Topics of Secondary School Biology II	3	-	-
4	<i>Educational Research (Biology)</i>	3	3	-
	<b>Subtotal</b>	<b>9</b>	<b>3</b>	<b>0</b>
	<b>Basic Science</b>			
5	Environmental Science	3	3	-
	<b>Subtotal</b>	<b>3</b>	<b>3</b>	<b>0</b>
	<b>Subject Matter</b>			
6	Laboratory Technique	3	2	1
7	Invertebrate Zoology	3	2	1
8	Animal Physiology	3	2	1
9	Genetics	3	2	1
10	Microbiology	3	2	1
11	Cell Biology	2	2	-
12	<i>Applied Biology</i>	3	2	1
13	Animal Ecology	3	2	1
14	Thesis	6	6	-
	<b>Subtotal</b>	<b>29</b>	<b>22</b>	<b>7</b>
	<b>Grand Total</b>	<b>43</b>	<b>30</b>	<b>13</b>

Curriculum Chemistry Education S1 (In-service)

No	Subjects	Credit	Theory	Practice
	<b>General Subjects</b>			
1.	Community Development Program	2	2	-
	<b>Subtotal</b>	<b>2</b>	<b>2</b>	<b>0</b>
	<b>Pedagogical Subject</b>			
	<b>a. General Pedagogy</b>			
		-	-	-
	<b>b. Specific Pedagogy</b>			
	Teaching and Learning Strategy (Chemistry)	4	3	1
	Selected Topics of Secondary School Chemistry	4	-	-
	<i>Educational Research (Chemistry)</i>	3	3	-
	<b>Subtotal</b>	<b>11</b>	<b>6</b>	<b>1</b>
	<b>Basic Science</b>			
		-	-	-
	<b>Subtotal</b>	<b>0</b>	<b>0</b>	<b>0</b>
	<b>Subject Matter</b>			
13.	Statistics	2	2	-
14.	<i>Introduction to Computer</i>	3	2	1
15.	<i>Environmental Chemistry</i>	2	1	1
16.	Instrumental Analytical Chemistry	3	2	1
17.	Organic Chemistry III	2	2	-
18.	Inorganic Chemistry III	2	2	-
19.	<i>Industrial Chemistry</i>	3	3	-
20.	Radiochemistry	2	2	-
21.	<i>Seminar on Chemistry</i>	2	2	-
22.	Thesis	6	6	-
	<b>Subtotal</b>	<b>27</b>	<b>24</b>	<b>3</b>
	<b>Grand Total</b>	<b>40</b>	<b>36</b>	<b>4</b>

Curriculum Physics Education S1 (In-service)

No	Subjects	Credit	Theory	Practice
	<b>General Subjects</b>			
1.	Community Development Program	2	2	-
	<b>Subtotal</b>	<b>2</b>	<b>2</b>	<b>-</b>
	<b>Pedagogical Subject</b>			
	<b>a. General Pedagogy</b>			
	-	-	-	-
	<b>b. Specific Pedagogy</b>			
	-	-	-	-
	<b>Subtotal</b>	<b>0</b>	<b>0</b>	<b>0</b>
	<b>Basic Science</b>			
	-	-	-	-
	<b>Subtotal</b>	<b>0</b>	<b>0</b>	<b>0</b>
	<b>Subject Matter</b>			
13.	Computer	3	2	1
14.	Mechanics	4	3	1
15.	Physical Mathematics II	4	4	-
16.	Electricity and Magnetism	4	4	-
17.	Waves	3	3	-
18.	Modern Physics	4	3	1
19.	<i>Statistical Physics</i>	3	3	-
20.	Quantum Physics	3	3	-
21.	Solid State Physics	3	3	-
22.	<i>Nuclear Physics</i>	3	2	1
23.	Thesis/qoloqium	6	6	-
	<b>Subtotal</b>	<b>40</b>	<b>36</b>	<b>4</b>
	<b>Grand Total</b>	<b>42</b>	<b>38</b>	<b>4</b>

*Italic = Local contents*, Normal = National contents



**Curriculum Mathematics Education S1 (In-service)**

No	Subjects	Credit	Theory	Practice
	<b>General Subjects</b>			
1.	Community Development Program	2	2	-
	<b>Subtotal</b>	<b>2</b>	<b>2</b>	<b>-</b>
	<b>Pedagogical Subject</b>			
	<b>a. General Pedagogy</b>			
	-	-	-	-
	<b>b. Specific Pedagogy</b>			
2.	<i>Educational Research (Mathematics)</i>	3	3	-
	<b>Subtotal</b>	<b>3</b>	<b>3</b>	<b>-</b>
	<b>Basic Science</b>			
	-	-	-	-
	<b>Subtotal</b>	<b>0</b>	<b>0</b>	<b>0</b>
	<b>Subject Matter</b>			
3.	Selected Topic in Secondary School Mathematics	4	4	-
4.	Real Analysis I	3	3	-
5.	Complex Analysis	3	3	-
6.	Abstract Algebra I	3	3	-
7.	Mathematical Statistics I	3	3	-
8.	Differential Equations	3	3	-
9.	Numerical Analysis	3	2	1
10.	Computer Programming	4	2	2
11.	Discrete Mathematics	3	3	-
12.	System of Geometry	3	3	-
13.	<i>Seminar on Mathematics</i>	3	3	-
	<b>Subtotal</b>	<b>35</b>	<b>32</b>	<b>3</b>
	<b>Grand Total</b>	<b>40</b>	<b>37</b>	<b>3</b>

### Curriculum Primary Teacher Education D2

No.	Subject	Credit	Theory	Practice
	<b>General Education</b>			
01	Religion Education	2	2	-
02	Pancasila	2	2	-
03	Religion Education Seminar	2	2	-
04	Education for National Resilience	2	2	-
	<b>Subtotal</b>	<b>8</b>	<b>8</b>	<b>0</b>
	<b>Educational Foundation</b>			
05	Foundation of Elementary	3	3	-
06	Child Developmental and learning	3	3	-
07	Classroom management	2	2	-
08	Assessment of learning	2	2	-
09	Guidance & Counseling in elementary school	2	2	-
10	Instructional Strategy	4	3	1
	<b>Subtotal</b>	<b>16</b>	<b>15</b>	<b>1</b>
	<b>Subject matter</b>			
11	Civics and Pancasila Education	3	3	-
12	Basic Concepts of Sosial Sciences	3	3	-
13	Social Science Education in Elementary School	3	3	-
14	Global Prespectives	2	2	-
15	Basic Concepts of Science	4	3	1
16	Science Education in Elementary School	4	3	1
17	Mathematics	3	3	-
18	Mathematics Education I	3	3	-
19	Mathematics Education II	3	2	1
20	Language Skills Education	3	3	-
21	Indonesian Language for lower classes	3	3	-
22	Indonesian Language for upper classes	3	3	-
23	Paint arts Education	3	2	1
24	Music Education	2	1	1
25	Drama and Dance Education	3	2	1
26	Sports and Health Education	3	2	1
27	Integrated Instructions	2	1	1
28	Field Experiences	5		5
	<b>Subtotal</b>	<b>55</b>	<b>42</b>	<b>13</b>
	<b>Grand total</b>	<b>79</b>	<b>65</b>	<b>14</b>

**Curriculum Biology S1 (Pure Science)**

No	Subjects	Credit	Theory	Practice
<b>General Subjects</b>				
1.	Pancasila Education	2	2	-
2.	Religion Education	2	2	-
3.	Education for National Resilience	2	2	-
4.	<i>Sports</i>	1	1	-
5.	<i>Arts</i>	1	1	-
6.	<i>Seminar on Religion Education</i>	2	2	-
7.	Environmental, Social, Culture and Technology Education	2	2	-
8.	Community Development Program	2	2	-
9.	<i>Indonesia Language</i>	2	2	-
10.	<i>English</i>	2	2	-
	<b>Subtotal</b>	<b>18</b>	<b>18</b>	<b>-</b>
<b>Basic Science</b>				
11.	General Biology	3	2	1
12.	Basic Chemistry I	4	3	1
13.	Basic Chemistry II	4	3	1
14.	Calculus I	3	3	-
15.	<i>Calculus II</i>	3	3	-
16.	<i>Environmental Science</i>	3	3	-
17.	Fundamental of Physics I	4	3	1
18.	Fundamental of Physics II	4	3	1
21.	Basic Statistics	3	3	-
22.	Biochemistry	3	2	1
	<b>Subtotal</b>	<b>34</b>	<b>28</b>	<b>6</b>
<b>Subject Matter</b>				
23.	<i>Laboratory Technique</i>	2	1	1
24.	Plant Anatomy	3	2	1
25.	Plant Morphology	3	2	1
26.	Animal Structure	3	2	1
27.	Invertebrate Zoology	3	2	1
28.	Vertebrate Zoology	3	2	1
29.	<i>Nutrition Science</i>	2	2	-
30.	Cryptogamic Botany	3	2	1
31.	<i>Entomology</i>	2	1	1
32.	Genetics	3	2	1
33.	Phanerogamic Botany	3	2	1
34.	<i>Embryology</i>	3	2	1
35.	Microbiology	3	2	1

No	Subjects	Credit	Theory	Practice
36.	Animal Ecology	3	2	1
37.	Animal Physiology	3	2	1
38.	Plant Physiology	3	2	1
39.	Plant Ecology	3	2	1
40.	Cell Biology	2	2	-
41.	Evolution	2	2	-
42.	<i>Instrumentation</i>	2	2	-
43.	<i>Parasitology</i>	2	2	-
44.	<i>Human Anatomy and Physiology</i>	3	3	-
45.	<i>Research Metodology</i>	3	3	-
46.	Biology Seminar	3	3	-
47.	<i>Toxicology</i>	3	3	-
48.	Practical Work(Internship)	2	-	2
49.	Thesis*)	6		
50.	Final Paper*)	6		
	<b>Subtotal</b>	<b>76</b>	<b>52</b>	<b>18</b>
	*) Choose one (6 credit semester hour)			
	<b>Subject Matter for Specialisation on Developmental Biology &amp; Biotechnology only</b>			
51.	<i>Plant Morphogenesis</i>	3	3	-
52.	<i>Industrial Microbiology</i>	3	3	-
53.	<i>Tissue Culture</i>	3	2	1
54.	<i>Secondary Metabolism</i>	2	2	-
55.	<i>Genetics Engineering</i>	3	3	-
56.	<i>Developmental Genetics</i>	2	2	-
	<b>Subtotal</b>	<b>16</b>	<b>15</b>	<b>1</b>
	<b>Subject Matter for Spesialisation on Environmental Biology only</b>			
57.	<i>Plant Ecophysiology</i>	3	2	1
58.	<i>Animal Ecophysiology</i>	3	2	1
59.	<i>Marine Biology</i>	3	2	1
60.	<i>Biokonservation</i>	2	2	-
61.	<i>Limnology</i>	3	2	1
62.	<i>Analysis of Environmental Impact</i>	2	2	-
	<b>Subtotal</b>	<b>16</b>	<b>12</b>	<b>4</b>

No	Subjects	Credit	Theory	Practice
	<b>Elective Subject Matter for Specialisation on Developmental Biology &amp; Biotechnology (Choose 10 credit hour semester)</b>			
63.	<i>Food Technology</i>	2	2	-
64.	<i>Radiobiology</i>	2	2	-
65.	<i>Biophysics</i>	2	2	-
66.	<i>Microtechnique</i>	2	-	2
67.	<i>Plant Nutrients</i>	2	2	-
68.	<i>Food Industry Planning</i>	2	2	-
	<b>Subtotal</b>	<b>10</b>	<b>8</b>	<b>2</b>
	<b>Elective Subject Matter for Specialisation on Environmental Biology (Choose 10 credit hour semester)</b>			
69.	<i>Geology</i>	2	2	-
70.	<i>Environmental Chemistry</i>	2	2	-
71.	<i>Climatology</i>	2	2	-
72.	<i>Mangrove Ecology</i>	2	2	-
73.	<i>Biogeography</i>	2	2	-
74.	<i>Ecotourism</i>	2	2	-
	<b>Subtotal</b>	<b>10</b>	<b>10</b>	<b>-</b>
	<b>Grand Total</b>	<b>154</b>	<b>120-121</b>	<b>25-26</b>

*Italic = Local contents, Normal = National contents*

Curriculum Physics S1 (Pure Science)

No	Subjects	Credit	Theory	Practice
	<b>General Subjects</b>			
1.	Pancasila Education	2	2	-
2.	Religion Education	2	2	-
3.	Education for National Resilience	2	2	-
4.	<i>Sports</i>	1	1	-
5.	<i>Arts</i>	1	1	-
6.	<i>Seminar on Religion Education</i>	2	2	-
7.	Environmental, Social, Culture and Technology Education	2	2	-
8.	Community Development Program	2	2	-
9.	<i>Indonesia Language</i>	2	2	-
10.	<i>English</i>	2	2	-
	<b>Subtotal</b>	<b>18</b>	<b>18</b>	<b>0</b>
	<b>Basic Science</b>			
11.	General Biology	3	2	1
12.	Basic Chemistry I	4	3	1
13.	<i>Basic Chemistry II</i>	4	3	1
14.	Calculus I	3	3	-
15.	Calculus II	3	3	-
16.	<i>Environmental Science</i>	3	3	-
17.	Fundamental of Physics I	4	3	1
18.	Fundamental of Physics II	4	3	1
19.	Physical Mathematics I	4	4	-
20.	Physical Mathematics II	4	4	-
21.	Computation Physics	3	2	1
22.	Data Analysis Technique	2	2	-
23.	Electronics I	3	2	1
24.	Electronics II	3	2	1
	<b>Subtotal</b>	<b>47</b>	<b>39</b>	<b>8</b>
	<b>Subject Matter</b>			
25.	Electrodynanic	3	3	-
26.	<i>Physical Geometry &amp; Optics</i>	3	3	-
27.	Basic Physics Laboratory I	2	-	2
28.	Basic Physics Laboratory II	2	-	2
29.	Waves	3	3	-
30.	Advanced Mechanics	3	3	-
31.	Thermodynamics	3	3	-

No	Subjects	Credit	Theory	Practice
32.	Modern Physics	4	3	1
33.	Physics Laboratory I	2	-	2
34.	Statistical Physics	3	3	-
35.	Quantum Physics I	3	3	-
36.	<i>Microprocessor Applications</i>	3	3	-
37.	<i>Electronic and Instrumentation</i>	3	2	1
38.	Physics Seminar	3	3	-
39.	Physics Laboratory II	2	-	2
40.	<i>Internships I</i>	4	-	4
41.	Quantum Physics II	3	3	-
42.	<i>Chemical Physics</i>	2	2	-
43.	<i>Biophysics</i>	2	2	-
44.	Solid State Physics	3	3	-
45.	Nuclear Physics	3	2	1
46.	<i>Particle Physics</i>	3	3	-
47.	<i>Introduction to Polymer Physics</i>	2	2	-
48.	<i>Introduction to Research in Physics</i>	2	2	-
49.	Recent Trends in Physics (Seminar)	2	2	-
50.	<i>Introduction to Geophysics</i>	2	2	-
51.	<i>Internships II</i>	4	-	4
52.	Final Project	6	-	-
	<b>Subtotal</b>	<b>80</b>	<b>55</b>	<b>19</b>
	<b>Specialization</b>			
	<b>Field : Geophysics (Choose 6 credit)</b>			
51.	<i>Geoelectricity</i>	3	3	-
52.	<i>Geomagnetism</i>	3	3	-
53.	<i>Geodynamics</i>	3	3	-
54.	<i>Method of Seismic</i>	3	2	1
55.	<i>Method of Gravitation</i>	3	2	1
	<b>Subtotal</b>	<b>6</b>	<b>4-6</b>	<b>0-2</b>
	<b>Field : Material Physics (Choose 6 credit)</b>			
56.	<i>Semiconductor Technology</i>	3	3	-
57.	<i>Superconductor I</i>	3	3	-
58.	<i>Superconductor II</i>	3	3	-
59.	<i>Materials Structure and Properties</i>	3	3	-
60.	<i>Crystallography</i>	3	3	-
61.	<i>Magnetic Resonance</i>	3	3	-
62.	<i>X-ray and Instrumentation</i>	3	2	1
63.	<i>X-ray Polycapilar Technology</i>	3	2	1
	<b>Subtotal</b>	<b>6</b>	<b>4-6</b>	<b>0-2</b>

No	Subjects	Credit	Theory	Practice
	<b>Field : Polymer Physics (Choose 6 credit)</b>			
64.	<i>Polymer Physics</i>	3	2	1
65.	<i>Polymer Electronic Properties</i>	3	3	-
66.	<i>Polymer Technology</i>	3	2	1
67.	<i>Polymer Thermodynamics</i>	3	3	-
68.	<i>Polymer Optical Properties</i>	3	3	-
69.	<i>Polimer Electric Properties</i>	3	3	-
	<b>Subtotal</b>	6	4-6	0-2
	<b>Grand Total</b>	151	116-118	27-29

*Italic = Local contents, Normal = National contents*



### Curriculum Chemistry S1 (Pure Science)

No.	Subjects	Credit	Theory	Practice
<b>General Subjects</b>				
1.	Pancasila Education	2	2	-
2.	Religion Education	2	2	-
3.	Education for National Resilience	2	2	-
4.	<i>Sports</i>	1	1	-
5.	<i>Arts</i>	1	1	-
6.	<i>Seminar on Religion Education</i>	2	2	-
7.	Environmental, Social, Culture and Technology Education	2	2	-
8.	Community Development Program	2	2	-
9.	<i>Indonesia Language</i>	2	2	-
10.	<i>English</i>	2	2	-
<b>Subtotal</b>		<b>18</b>	<b>18</b>	<b>0</b>
<b>Basic Science</b>				
11.	General Biology	3	2	1
12.	Basic Chemistry I	4	3	1
13.	Basic Chemistry II	4	3	1
14.	Calculus I	3	3	-
15.	Calculus II	3	3	-
16.	<i>Environmental Science</i>	3	3	-
17.	Fundamental of Physics I	4	3	1
18.	Fundamental of Physics II	4	3	1
19.	Statistics Methods	3	3	-
20.	Modern Physics	3	3	-
21.	Mathematics for Chemistry	3	3	-
<b>Subtotal</b>		<b>37</b>	<b>32</b>	<b>5</b>
<b>Subject Matter</b>				
22.	<i>Management and Entrepreneurships</i>	2	2	-
23.	<i>Microbiology</i>	2	2	-
24.	Analytical Chemistry I	4	3	1
25.	Analytical Chemistry II	3	2	1
26.	Spectroscopic Analysis	2	2	-
27.	Instrumental Analytical Chemistry Laboratory	1	-	1
28.	Advance Separation Chemistry	2	2	-
29.	Biochemistry	4	4	-
30.	Biochemistry Laboratory	1	-	1
31.	Chemical Bond	3	3	-
32.	<i>Environmental Chemistry</i>	2	2	-
33.	<i>Field Study</i>	2	2	-
34.	Inorganic Chemistry I	3	2	1
35.	Inorganic Chemistry II	3	2	1
36.	Inorganic Chemistry III	2	2	-
37.	<i>Introduction to Computer</i>	3	2	1
38.	<i>Computational Chemistry</i>	2	2	-
39.	<i>Computational Chemistry Laboratory</i>	1	-	1
40.	Natural Product Laboratory	1	-	1
41.	Organic Chemistry I	3	3	-
42.	Organic Chemistry II	3	3	-
43.	Organic Chemistry Laboratory I	2	-	2
44.	Organic Chemistry Laboratory II	2	-	2
45.	Natural Product	2	2	-

No.	Subjects	Credit	Theory	Practice
46.	Organic Physics	2	2	-
47.	<i>Organometal</i>	3	3	-
48.	Physical Chemistry I	4	4	-
49.	Physical Chemistry II	4	4	-
50.	Physical Chemistry Laboratory I	1	-	1
51.	Physical Chemistry Laboratory II	1	-	1
52.	Radiochemistry	2	2	-
53.	<i>Seminar</i>	1	1	-
54.	Thesis	6	6	-
	<b>Sub total</b>	<b>79</b>	<b>65</b>	<b>14</b>
55.	<b>Elective</b>			
56.	<i>Advance Environmental Chemistry 1)</i>	2	2	-
57.	<i>Environmental Chemistry Laboratory 1)</i>	2	-	2
58.	<i>Water Treatment Process 1)</i>	2	2	-
59.	<i>Water Treatment Process Laboratory 1)</i>	1	-	1
60.	<i>Environmental Management 1)</i>	2	2	-
61.	<i>Environmental Toxicology 1)</i>	2	2	-
62.	<i>Waste Treatment Process 1)</i>	2	2	-
63.	<i>Waste Treatment Process Laboratory 1)</i>	1	-	1
64.	<i>System and Design of Waste Treatment Installation 1)</i>	2	2	-
	<b>Subtotal</b>	<b>16</b>	<b>12</b>	<b>4</b>
65.	<i>Food Chemistry 2)</i>	2	2	-
66.	<i>Food Chemistry Laboratory 2)</i>	2	-	2
67.	<i>Nutrition 2)</i>	2	2	-
68.	<i>Food Processing 2)</i>	2	2	-
69.	<i>Food Processing Laboratory 2)</i>	2	-	2
70.	<i>Microbiology Laboratory 2)</i>	1	-	1
71.	<i>Food Technology 2)</i>	2	2	-
72.	<i>Food Technology Laboratory 2)</i>	1	-	1
73.	<i>Traditional Food 2)</i>	2	2	-
	<b>Subtotal</b>	<b>16</b>	<b>10</b>	<b>6</b>
74.	<i>Electronic 3)</i>	2	2	-
75.	<i>Statistics for Analytical Chemistry 3)</i>	2	2	-
76.	<i>Spectrometry 3)</i>	2	2	-
77.	<i>Instrumentation Laboratory 3)</i>	1	-	1
78.	<i>Electro Analysis 3)</i>	2	2	-
79.	<i>Interfacing 3)</i>	3	3	-
80.	<i>Interfacing Laboratory 3)</i>	2	-	2
81.	<i>Chromatography 3)</i>	2	2	-
	<b>Subtotal</b>	<b>16</b>	<b>13</b>	<b>3</b>
	<b>Total</b>	<b>150</b>	<b>115</b>	<b>35</b>

**Notes :**

Choose 1) or 2) or 3)

Italic = Local contents

**Curriculum Mathematics Education S1 (Pre-service)**

No	Subjects	Credit	Theory	Practice
	<b>General Subjects</b>			
1.	Pancasila Education	2	2	-
2.	Religion Education	2	2	-
3.	Education for National Resilience	2	2	-
4.	<i>Sports</i>	1	1	-
5.	<i>Arts</i>	1	1	-
6.	<i>Seminar on Religion Education</i>	2	2	-
7.	Environmental, Social, Culture and Technology Education	2	2	-
8.	Community Development Program	2	2	-
9.	<i>Indonesia Language</i>	2	2	-
10.	<i>English</i>	2	2	-
	<b>Subtotal</b>	<b>18</b>	<b>18</b>	<b>-</b>
	<b>Basic Science</b>			
11.	General Biology	3	2	1
12.	Basic Chemistry I	4	3	1
13.	<i>Basic Chemistry II</i>	4	3	1
14.	Calculus I	3	3	-
15.	Calculus II	3	3	-
16.	Calculus III	3	3	-
17.	<i>Environmental Science</i>	3	3	-
18.	Fundamental of Physics I	4	3	1
19.	<i>Fundamental of Physics II</i>	4	3	1
20.	<i>Multivariate Calculus</i>	4	4	-
21.	Linear Algebra	3	3	-
22.	Basic Statistics	3	3	-
23.	Introduction to Programing	4	3	1
24.	Numerical Analysis	3	3	-
	<b>Subtotal</b>	<b>48</b>	<b>42</b>	<b>6</b>
	<b>Subject Matter (Compulsary subjects)</b>			
25.	Matrix Algebra	2	2	-
26.	<i>An Introduction to The Principle of Mathematics</i>	3	3	-
27.	<i>Number Theory</i>	2	2	-
28.	Discrete Mathematics	3	3	-
29.	Real Analysis I	3	3	-
30.	Real Analysis II	3	3	-
31.	Abstract Algebra I	3	3	-

No	Subjects	Credit	Theory	Practice
32.	Abstract Algebra II	3	3	-
33.	Differential Equations	3	3	-
34.	Transformation Geometry	3	3	-
35.	Mathematical Statistics I	3	3	-
36.	Mathematical Statistics II	3	3	-
37.	Complex Analysis	3	3	-
38.	<i>Introduction to Economy and Industry</i>	2	2	-
39.	<i>Linear Programing</i>	3	3	-
40.	Partial Differential Equations	3	3	-
41.	<i>An Introduction to Topology</i>	3	3	-
42.	System of Geometry	3	3	-
43.	Final Project	6		
	<b>Subtotal</b>	<b>57</b>	<b>57</b>	<b>0</b>
	<b>Subject Matter (Elective)</b> Choose 27 credits from the following courses listed based on academic adviser			
	<b>Field : Statistics</b>			
44.	<i>Sampling Theory</i>	3	3	-
45.	<i>Regression and Variance Analysis</i>	3	3	-
46.	Linear Models	3	3	-
47.	<i>Operation Research</i>	3	3	-
48.	<i>Econometrics</i>	3	3	-
49.	<i>Selected Topics in Statistics</i>	3	3	-
50.	<i>Experimental Design</i>	3	3	-
51.	<i>Introduction to Stocastic Theory</i>	3	3	-
52.	<i>Decision Theory</i>	3	3	-
	<b>Field : Analysis</b>			
53.	Advance Complex Analysis	3	3	-
54.	Mathematical Modeling	3	3	-
55.	<i>Selected Topics in Analysis</i>	3	3	-
56.	<i>Topology</i>	3	3	-
57.	<i>Real Analysis III</i>	3	3	-
58.	<i>Advance differential equation</i>	3	3	-
	<b>Field :Algebra</b>			
59.	<i>Graph Theory</i>	3	3	-
60.	<i>Modul and Spatial Vector</i>	3	3	-
61.	<i>Polynom</i>	3	3	-
62.	<i>Selected Topics in Algebra</i>	3	3	-

No	Subjects	Credit	Theory	Practice
63.	<i>Coding Theory</i>	3	3	-
64.	<i>Letis Algebra</i>	3	3	-
65.	<i>Boolean Algebra</i>	3	3	-
66.	<i>Advance Linear Algebra</i>	3	3	-
	<b>Field : Computation</b>			
67.	<i>Mathematical Appication Softwares</i>	3	2	1
68.	<i>Algorithm and Programing I</i>	3	2	1
69.	<i>Computer Architecture</i>	3	3	-
70.	<i>Selected Topics in Computation</i>	3	3	-
71.	<i>Data Processing</i>	3	2	1
72.	<i>Database</i>	3	2	1
	<b>Grand Total</b>	<b>150</b>	<b>144-150</b>	<b>6-10</b>

*Italic = Local contents, Normal = National contents*

## Student Number IKIP Bandung

Faculty/year	1994		1995		1996		1997		1998		1999		2000		2001		2002		2003		2004	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
<b>FIP</b>	1,514	2,907	1,429	2,786	1,461	2,983	634	1,002	548	1,096	551	1,101	553	1,107	556	1,113	556	1,111	561	1,124	564	1,130
Total	4,421	4,215	4,444	4,444	4,444	4,444	1,636	1,636	1,644	1,644	1,652	1,652	1,660	1,660	1,669	1,669	1,667	1,667	1,685	1,685	1,694	1,694
<b>FPBS</b>	902	1,451	954	1,586	1,232	2,129	924	2,013	983	1,968	987	1,973	989	1,980	993	1,985	997	1,990	999	1,997	1,003	3,001
Total	2,353	2,540	3,361	3,361	3,361	3,361	2,937	2,937	2,951	2,951	2,960	2,960	2,969	2,969	2,987	2,987	2,987	2,987	2,996	2,996	3,004	3,004
<b>FPIPS</b>	733	1,074	730	1,093	878	1,292	770	1,440	772	1,440	864	1,350	866	1,350	796	1,422	845	1,375	885	1,338	879	1,346
Total	1,807	1,823	2,170	2,170	2,170	2,170	2,210	2,210	2,212	2,212	2,214	2,214	2,216	2,216	2,218	2,218	2,220	2,220	2,223	2,223	2,225	2,225
<b>FPMIPA</b>	742	973	643	791	666	912	678	1,064	1,009	1,415	1,056	1,489	1,121	1,551	1,196	1,610	1,247	1,699	1,324	1,770	1,377	1,871
Total	1,715	1,434	1,588	1,588	1,588	1,588	1,742	1,742	2,424	2,424	2,525	2,525	2,672	2,672	2,806	2,806	2,946	2,946	3,094	3,094	3,248	3,248
<b>FPTK</b>	1,179	742	1,107	761	827	688	938	746	955	745	972	745	998	744	1,006	742	1,021	743	1,037	744	1,054	742
Total	1,921	1,868	1,515	1,515	1,515	1,515	1,684	1,684	1,700	1,700	1,717	1,717	1,732	1,732	1,748	1,748	1,764	1,764	1,781	1,781	1,796	1,796
<b>FPOK</b>	997	205	906	188	752	158	605	110	612	110	619	111	627	110	630	115	663	118	636	122	639	127
Total	1,202	1,094	910	910	910	910	715	715	722	722	730	730	737	737	745	745	751	751	758	758	766	766
<b>Grand total</b>	6,067	7,352	5,769	7,205	5,816	8,162	4,549	6,375	4,879	6,774	5,049	6,769	5,144	6,842	5,177	6,987	5,299	7,036	5,442	7,095	5,516	8,217
Total	13,419	12,974	13,988	13,988	13,988	13,988	10,924	10,924	11,653	11,653	11,818	11,818	11,986	11,986	12,164	12,164	12,335	12,335	12,537	12,537	12,733	12,733

Note: Students in S1 in-service program are not included.

Source : Answers submitted by IKIP Bandung for Questionnaires, 1998

Student number IKIP Bandung FPMIPA

Dept.	Program	Grade	Year																							
			1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004													
			Edu	N.Edu	Edu	N.Edu	Edu	N.Edu	Edu	N.Edu	Edu	N.Edu	Edu	N.Edu	Edu	N.Edu										
Phy	SI (pre service)	1	74	0	53	0	64	0	80	0	89	60	70	60	40	80	40	80	40	60	100	70	120	80		
		2	58	0	58	0	51	0	65	0	95	0	96	60	80	60	80	40	80	40	80	40	80	100	70	
		3	65	0	51	0	57	0	59	0	78	0	95	0	94	60	84	60	84	60	95	40	80	40	80	60
		4	215	0	228	0	206	0	169	0	217	0	192	0	165	0	149	60	153	63	153	63	160	65	124	56
		Subtotal	412	0	390	0	378	0	373	0	479	60	453	120	419	160	393	200	408	203	408	203	420	235	424	266
	SI (in service)	4	0	0	0	32	0	32	0	80	0	80	0	80	0	80	0	80	0	80	0	80	0	80	0	
	Total		412	390	410	453	619	653	659	673	691	735	770													
Chemistry	SI (pre service)	1	75	0	70	0	68	0	85	0	98	50	80	50	80	40	80	40	80	40	80	40	100	70	120	80
		2	66	0	58	0	71	0	69	0	83	0	87	50	85	50	80	40	80	40	80	40	80	40	100	70
		3	72	0	51	0	51	0	64	0	82	0	89	0	92	50	88	50	88	50	95	40	80	40	80	40
		4	209	0	198	0	187	0	165	0	200	0	182	0	170	0	165	50	182	70	182	70	185	65	174	44
		Subtotal	422	0	377	0	377	0	383	0	463	50	438	100	427	140	413	180	437	190	445	215	474	234		
	SI (in service)	4	0	0	0	41	0	41	0	82	0	80	0	80	0	80	0	80	0	80	0	80	0	80	0	
	Total		422	377	418	468	595	618	647	673	707	740	788													
Biology	SI (pre service)	1	76	0	71	0	70	0	85	0	100	55	90	40	120	40	120	40	120	40	120	40	120	70	120	80
		2	77	0	59	0	70	0	71	0	95	0	98	55	120	40	120	40	120	40	120	40	120	40	120	70
		3	81	0	60	0	65	0	77	0	97	0	102	0	117	55	133	40	150	40	150	40	140	40	140	40
		4	74	0	57	0	59	0	59	0	95	0	126	0	143	0	159	55	178	79	180	85	174	74		
		Subtotal	308	0	247	0	264	0	292	0	387	55	416	95	500	135	532	175	568	199	560	235	554	264		
	SI (in service)	4	100	0	19	0	56	0	81	0	83	0	80	0	80	0	80	0	80	0	80	0	80	0		
	Total		408	266	320	373	525	591	715	787	847	875	898													
Math	SI (pre service)	1	109	0	87	0	88	0	86	0	98	60	90	40	80	40	80	40	80	40	80	40	100	70	120	80
		2	119	0	92	0	85	0	88	0	115	0	85	60	80	40	80	40	80	40	80	40	80	40	100	70
		3	104	0	97	0	98	0	113	0	143	0	178	0	131	60	118	40	130	40	120	40	120	40	120	40
		4	141	0	125	0	126	0	92	0	175	0	150	0	140	0	135	60	141	70	144	70	144	70	124	58
		Subtotal	473	0	401	0	397	0	379	0	531	60	503	100	431	140	413	180	431	190	444	220	464	248		
	SI (in service)	4	0	0	0	43	0	43	0	94	0	80	0	80	0	80	0	80	0	80	0	80	0	80	0	
	Total		473	401	440	448	685	683	651	701	744	792														
Total (SI)			1615	0	1415	0	1416	0	1427	0	1860	225	1810	415	1777	575	1751	735	1844	782	1869	905	1916	1012		
Grand Total			100	19	172	315	339	320	320	320	2545	2672	2806	2946	3094	3248										

Source : Answers submitted by IKIP Bandung for Questionnaires, 1998

Student Number IKIP Yogyakarta

Faculty/year	1994		1995		1996		1997		1998	1999	2000	2001	2002	2003	2004
	Male	Female	Male	Female	Male	Female	Male	Female							
FIP	611	1,069	694	1,384	601	1,336	444	1,006							
Total	1,680		2,078		1,937		1,450		1,667	1,967	2,167	2,267	2,300	2,250	2,250
FPBS	971	1,433	908	1,594	852	1,554	771	1,378							
Total	2,404		2,502		2,406		2,149		2,352	2,852	3,052	3,252	3,300	3,250	3,250
FPIPS	812	1,243	802	1,445	747	1,554	672	1,290							
Total	2,055		2,247		2,301		1,962		2,117	2,617	2,817	2,917	2,950	2,900	2,900
FPMIPA	613	708	459	756	390	728	646	1,085							
Total	1,321		1,215		1,118		1,731		1,568	1,742	1,862	1,946	2,061	2,000	2,000
FPTK	1,214	467	1,219	494	1,246	540	1,176	511							
Total	1,681		1,713		1,786		1,689		2,054	2,554	2,654	2,754	2,800	2,750	2,750
FPOK	778	243	808	154	667	164	580	129							
Total	1,021		962		831		709		637	787	937	1,087	1,100	1,050	1,050
Grand Total	4,999	5,163	4,890	5,827	4,503	5,876	4,289	5,399							
	10,162		10,717		10,379		9,688		10,107	12,519	13,489	14,223	14,511	14,200	14,200

Note: Students in S1 in-service program are not included.

Source : Answers submitted by IKIP Yogyakarta for Questionnaires, 1998



Student Number IKIP Yogyakarta FPMIPA

Dept.	Program	Grade	Year																
			1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004						
			Edu	N.Edu	Edu	N.Edu	Edu	N.Edu	Edu	N.Edu	Edu	N.Edu	Edu	N.Edu					
Physics	SI(pre service)	1																	
		2																	
		3																	
		4																	
	Subtotal	318	273	276	286	42	265	38	280	79	282	117	284	156	283	192	280	190	
	Subtotal	33	40	22	133	107	410	90	449	179	80	525	50	490	50	520	50	520	
Chemistry	SI(pre service)	1																	
		2																	
		3																	
		4																	
	Subtotal	281	268	262	270	42	243	40	269	79	271	118	273	157	265	193	260	190	
	Subtotal	24	36	15	92	67	350	50	398	429	40	488	30	460	30	480	30	480	
Biology	SI(pre service)	1																	
		2																	
		3																	
		4																	
	Subtotal	327	278	248	263	42	245	39	277	79	279	118	281	158	280	193	280	190	
	Subtotal	21	33	22	96	88	372	60	416	447	50	513	40	479	40	500	30	500	
Math	SI(pre service)	1																	
		2																	
		3																	
		4																	
	Subtotal	278	258	254	262	42	246	40	260	79	259	118	260	157	267	193	280	190	
	Subtotal	39	29	19	161	153	436	140	479	507	130	535	100	517	75	500	50	500	
Total SI			1204	1077	1040	1091	168	996	157	1086	316	1091	471	1098	628	1095	771	1080	760
			117	138	78	482	415	340	300	300	195	220	195	160	160	160	160	160	
	Grand Total		1321	1215	1118	1731	1568	1742	1862	1946	2061	2000	2000	2000	2000	2000	2000	2000	

Source : Answers submitted by IKIP Yogyakarta for Questionnaires, 1998

Student Number IKIP Malang

Faculty / year	1994		1995		1996		1997		1998	1999	2000	2001	2002	2003	2004
	Male	Female	Male	Female	Male	Female	Male	Female							
FIP	514	522	487	487	418	480	372	442							
Total	1,068		974		898		814		814	934	1,054	1,174	1,294	1,388	1,430
FPBS	569	796	472	776	432	742	366	651							
Total	1,365		1,248		1,174		1,017		1,097	1,257	1,417	1,553	1,661	1,773	1,829
FPIPS	606	1,282	543	1,262	490	1,223	436	1,069							
Total	1,888		1,805		1,713		1,505		1,505	1,545	1,665	1,785	1,905	2,013	2,097
FPMIPA	523	1,041	484	1,114	477	1,129	454	1,198							
Total	564		598		1,606		1,652		1,562	1,705	1,915	2,316	2,558	2,833	3,264
FPTK	519	185	530	181	534	184	535	117							
Total	704		711		718		712		712	832	952	1,072	1,192	1,276	1,318
Grand Total	2,763	3,826	2,516	3,820	2,351	3,758	2,075	3,450							
	6,589		6,336		6,109		5,525		5,690	6,273	7,003	7,900	8,610	9,283	9,938

Note: Students in S1 in-service program are not included.

Source : Answers submitted by IKIP Malang for Questionnaires 1998

Student Number IKIP Malang FPMIPA

Dept.	Program	Grade	Year																							
			1994		1995		1996		1997		1998		1999		2000		2001		2002		2003		2004			
			Edu	N.Edu	Edu	N.Edu	Edu	N.Edu	Edu	N.Edu	Edu	N.Edu	Edu	N.Edu	Edu	N.Edu	Edu	N.Edu	Edu	N.Edu	Edu	N.Edu	Edu	N.Edu		
Phisic	SI (pre service)	1	81	0	82	0	77	0	55	44	45	40	50	0	82	50	96	50	110	50	127	50	145			
		2	80	0	81	0	82	0	77	0	55	44	45	0	70	50	82	50	96	50	110	50	127			
		3	75	0	80	0	81	0	82	0	77	0	55	0	40	50	70	50	82	50	96	50	110			
		4	154	0	162	0	174	0	176	0	146	0	134	0	105	44	83	68	90	112	90	159	90	193		
	Subtotal	390	0	405	0	414	0	390	44	323	84	284	0	250	236	233	316	240	400	240	492	240	575			
	SI (in service)	3	0	0	0	40	0	114	0	27	0	40	0	40	0	40	0	40	0	40	0	40	0			
	4	0	0	0	0	40	0	548	434	434	0	438	0	526	589	589	0	680	772	772	0	855				
	Total	390	0	405	0	454	0	548	434	434	0	438	0	526	589	589	0	680	772	772	0	855				
Chemistry	SI (pre service)	1	80	0	71	0	74	0	50	46	50	40	50	0	82	50	96	50	110	50	127	50	145			
		2	79	0	80	0	71	0	74	0	50	46	50	0	70	50	82	50	96	50	110	50	127			
		3	71	0	79	0	80	0	71	0	74	0	50	0	40	50	70	50	82	50	96	50	110			
		4	130	0	139	0	158	0	147	0	110	0	109	0	82	46	82	72	82	114	82	155	82	201		
	Subtotal	360	0	369	0	383	0	342	46	284	86	259	0	232	238	232	320	232	402	232	488	232	583			
	SI (in service)	3	0	0	0	40	0	103	0	21	0	40	0	40	0	40	0	40	0	40	0	40	0			
	4	0	0	0	0	40	0	491	391	391	0	455	0	510	592	592	0	674	670	670	0	855				
	Total	360	0	369	0	423	0	491	391	391	0	455	0	510	592	592	0	674	670	670	0	855				
Biology	SI (pre service)	1	80	0	81	0	75	0	54	40	50	40	50	0	82	50	96	50	110	50	127	50	145			
		2	81	0	80	0	81	0	75	0	54	40	50	0	70	50	82	50	96	50	110	50	127			
		3	74	0	81	0	80	0	81	0	75	0	54	0	40	50	70	50	82	50	96	50	110			
		4	191	0	168	0	169	0	168	0	137	0	123	0	97	40	92	68	92	104	92	155	92	188		
	Subtotal	396	0	410	0	405	0	378	40	316	80	277	0	247	232	242	316	242	392	242	488	242	570			
	SI (in service)	3	0	0	0	40	0	89	0	20	0	40	0	40	0	40	0	40	0	40	0	40	0			
	4	0	0	0	0	40	0	507	416	416	0	467	0	519	598	598	0	674	770	770	0	852				
	Total	396	0	410	0	445	0	507	416	416	0	467	0	519	598	598	0	674	770	770	0	852				
Math	SI (pre service)	1	85	0	72	0	77	0	48	45	48	40	50	0	82	50	96	50	110	50	127	50	145			
		2	82	0	85	0	72	0	72	0	48	45	48	0	70	50	82	50	96	50	110	50	127			
		3	74	0	82	0	85	0	77	0	72	0	48	0	48	50	70	50	82	50	96	50	110			
		4	177	0	175	0	170	0	170	0	136	0	124	0	95	45	88	71	98	114	98	160	98	192		
	Subtotal	418	0	414	0	404	0	367	45	304	85	270	0	243	237	238	319	248	402	248	493	248	574			
	SI (in service)	3	0	0	0	40	0	139	0	67	0	40	0	40	0	40	0	40	0	40	0	40	0			
	4	0	0	0	0	40	0	551	456	456	0	465	0	520	597	597	0	690	781	781	0	862				
	Total	418	0	414	0	444	0	551	456	456	0	465	0	520	597	597	0	690	781	781	0	862				
	Total SI	1564	0	1598	0	1606	0	1477	175	1227	335	1090	615	972	1045	1271	962	1596	962	1871	962	2302				
	Total SI in service	0	0	0	0	160	0	445	135	135	160	160	160	160	160	160	160	160	160	160	160	160				
	Grand total	1564	0	1598	0	1766	0	2097	1697	1697	0	1865	0	1975	2376	2376	0	2618	2893	2893	0	3324				

Source : Answers submitted by IKIP Maling for Questionnaires, 1998

## I. DOCUMENT LIST ( DGHE )

NO.	TITLE	DATE
DG - 1	LETTER AND ANSWERS TO QUESTIONNAIRE FROM DR. SATRYO	98/08/05
DG - 2	LONG-TERM GUIDELINES OF HIGHER EDUCATION DEVELOPMENT 1996 - 2005 (BY DR. BAMBANG SOEHENDRO)	98/08/27 FOR 3.1 (1)
DG - 3.1	RECTOR OF DISCUSSIONS (SIGNED ON 14 JULY 1998)	98/08/27 FOR 3.3 (4)
DG - 3.2	MINUTES OF DISCUSSION (SIGNED ON 14 JULY 1998)	98/08/27 FOR 3.3 (4)
DG - 4	MINUTES OF DISCUSSION (SIGNED ON 14 JULY 1998)	98/08/27 FOR 3.3 (5)(6)
DG - 5	MENRI PENDIDIKAN DAN KEBUDAYAAN	98/08/27 FOR 3.5 (1)
DG - 6	PROPOSAL, PENYELENGGARAAN PROGRAM PENEYETARAAN S-1 DALAM JABATAN ANGKATAN III TAHUN AKADEMIK 1998/1999 (EXAMPLE OF S-1 IN SERVICE PROGRAM AT IKIP MALANG)	98/08/27 FOR 3.5 (3)
DG - 7	PROPOSAL, PENYELENGGARAAN PROGRAM PENEYETARAAN S-1 PROYEK PGSM DI IKIP SURABAYA TAHUN 1998/1999 (EXAMPLE OF S-1 IN-SERVICE PROGRAM AT IKIP SURABAYA)	98/08/27 FOR 3.5 (3)

## II. DOCUMENT LIST ( PGSM )

PG - 1	WORLD BANK PGSM REPORT 1996	98/08/14
PG - 2	WORLD BANK PGSD REPORT 1996	98/08/14

### III. DOCUMENT LIST ( IKIP-BANDUNG )

NO.	TITLE	DATE
B - 1	PROPOSAL OF EQUIPMENT PROVISION BOOK-1 LIST OF EQUIPMENT (July 1998)	98/08/05
B - 2	PROPOSAL OF EQUIPMENT PROVISION BOOK-2 LIST OF EXPERIMENTS/LABORATORY ACTIVITIES (July 1998)	98/08/05
B - 3	PROPOSAL OF LABORATORY, WORKSHOP, CLASSROOM, AND SUPPORT FACILITIES PROVISION (July 1998)	98/08/05
B - 4	ANSWER TO QUESTIONNAIRE	98/08/05, 26
B - 5	RENCANA INDUK PENGEMBANGAN INSTITUTE KEGURUAN DA LIMU PENDIDIKAN BANDUNG 1995 - 2005	98/08/26
B - 6	REPLY TO QUESTIONNAIRE	98/09/01
B - 7	SUPPLEMENTAL DATA	
B - 8	DECLARATION OF DIRECTOR GENERAL CIPTA KARYA	98/09/01
B - 9	REPORT OF WATER QUALITY TEST	98/08/27
B - 10	COST OF SITE DEVELOPMENT	98/08/28
B - 11	DATA OF CAFFETERIA	98/08/08, 12
B - 12	LABORATORY LAYOUT	98/09/02
B - 13	LIST OF EXISTING EQUIPMENT	
B - 14	MASTER PLAN OF DEVELOPMENT (1995 - 2005)	98/09/01
B - 15	DRAWINGS	
	①Top Map	98/08/06
	②Existing Building Drawing (Library)	98/08/12
	③Existing Building Drawing (Gym)	98/08/12
	④Existing Building Drawing (Staff House)	98/08/12
	⑤Existing Building Drawing (Graduate School)	98/08/12
	⑥Existing Building Drawing (Guest House)	98/08/12

IV. DOCUMENT LIST ( IKIP-MALANG )

NO.	TITLE	DATE
M - 1	BOOK I PROGRAM Prepared for the Basic Design Study Team JICA August 5 – 6 , 1998	98/08/05
M - 2	BOOK II LIST OF EQUIPMENT	98/08/05
M - 3	BOOK III LABORATORY RENOVATION	98/08/05
M - 4	BOOK IV ADDITIONAL EQUIPMENT AND RENOVATION	98/08/05
M - 5	Answer to Questionnaire	98/08/05
M - 6	Drawings ( A-3 )	98/08/05
M - 7	SAJIAN MATA KULIAH	98/08/05
M - 8	PGSM EQUIPPED LIST 1997/1998	98/08/22
M - 9	ANSWER TO THE QUESTIONNAIRE	98/08/29
M - 10	SCHOOL DATA	98/08/24
M - 11	ANALYSIS OF DEEP WATER QUALITY	98/08/26
M - 12	DRAWINGS	
	①Existing Building Drawing (Mathematics)	98/08/28
	②Existing Building Drawing (Physics)	98/08/28
	③Existing Building Drawing (Chemistry)	98/08/28
	④Existing Building Drawing (Biology)	98/08/28
	⑤Existing Building Drawing (Multipurpose)	98/08/28
	⑥Existing Building Drawing (General)	98/08/28

V. DOCUMENT LIST ( IKIP-YOGYAKARTA )

NO.	TITLE	DATE
Y - 1	PROPOSAL FOR RENOVATION and REHABILITATION for LABORATORIES, JICA OFFICE AND SUPPORTING FACILITIES FOR LABORATORY	98/08/07
Y - 2	THE PROPOSAL OF LABOTATORY EQUIPMENT FPMIPA IKIP YOGYAKARTA SUPPORTED BY JICA 1998	98/08/07
Y - 3	THE PROPOSAL FOR BUDGETING THE IMPLEMENTATION OF ACTIVITIES OF THE PROJECT FPMIPA IKIP YOGYAKARTA SUPPORTED BY JICA 1998	98/08/07
Y - 4-1	( Development of ) LABORATORIES OF FPMIPA IKIP YOGYAKARTA	98/08/08
Y - 4-2	CURRICULUM 1997, STUDENT BODY, ACADMEIC STAFF, FINANCIAL RECORD	98/08/08
Y - 5	INFORMASI JURUSAN PENDIDIKAN KIMIA DAN PROGRAM STUDI PENDIDIKAN KIMIA	98/08/08
Y - 6	FPMIPA IKIP YOGYAKARTA In answer to the : Questionnaire for Long Term Study.....	98/08/08
Y - 7	THE PROPOSAL OF LABORATORY EQUIPMENT FPMIPA IKIP YOGYAKARTA SUPPORTED BY JICA 1998	98/08/18
Y - 8	FPMIPA IKIP YOGYAKARTA ANSWERING TO THE QUESTIONNAIRE AUGUST 1998	98/08/18
Y - 9	PGSM Equipment List ( 1997 )	98/08/18
Y - 10	PGSM Equipment List ( 1998 )	98/08/18
Y - 11	GETTING TO KNOW ABOUT IKIP YOGYAKARTA.	98/08/19
Y - 12	BAGAN STRUKTUR ORGANISASI	98/08/19
Y - 13	RENCANA KEGIATAN DAN PENGANGGARAN TERPADU (RKPT), IKIP YOGYAKARTA TAHUN ANGGARAN 1998/1999	98/08/19
Y - 14	IKIP YOGYAKARTA MENUJU UNIVERSITAS NEGERI YOGYAKARTA RENCANA OPERASIONAL 1997/1998 – 2001/2002	98/08/19
Y - 15	LAPORAN REKTOR IKIP YOGYAKARTA PADA DIES NATALIS KE – 34, 21 MEI 1998	98/08/19
Y - 16	BUKU INFORMASI IKIP YOGYAKARTA	98/08/19
Y - 17	CHAPTER 4 (Answer to Questionnaire)S	98/08/22
Y - 18	CONSTRUCTION SCHEDULE (Chemistry Building)	98/08/19, 22
Y - 19	WATER QUALITY TEST	98/09/04

NO.	TITLE	DATE
Y - 20-1	DATA OF EXISTING EQUIPMENT (Mathematics)	
Y - 20-2	DATA OF EXISTING EQUIPMENT (Physics)	
Y - 20-3	DATA OF EXISTING EQUIPMENT (Chemistry)	
Y - 20-4	DATA OF EXISTING EQUIPMENT (Biology)	
Y - 21	DRAWINGS	
	①Existing Building Drawing (Mathematics)	98/08/22
	②Existing Building Drawing (Physics)	98/08/22
	③Existing Building Drawing (Chemistry)	98/08/22
	④Existing Building Drawing (Biology)	98/08/22

#### VI. DOCUMENT LIST ( PPPG-YOGYAKARTA )

NO.	TITLE	DATE
PPPG - 1	PROGRAM KERJA PUSAT PENGEMBANGAN PENATARAN GURU MATEMATIKA YOGYAKARTA TAHUN 1998 / 1999	98/08/20
PPPG - 2	Phamflet PPPG Yogyakarta	98/08/20
BPG - 1	PROPOSAL PENATARAN BALAI PENATARAN GURU SLEMAN PROPINSI DAERAH ISTIMEWA YOGYAKARTA TAHUN 1998 / 1999	98/08/20
BPG - 2	DATA GURU YANG TELAH DITATAR BPG SLEMAN YOGYAKARTA TAHUN 1992 / 1993 s/d 1997 / 1998	98/08/20
BPG - 3	PROGRAM KERJA BALAI PENATARAN GURU PROPINSI DAERAH ISTIMEWA YOGYAKARTA TAHUN 1998 / 1999	98/08/20
YS - 1	Data from SMU Babarsari Yogyakarta ( Senior High School )	98/08/20
YS - 2	Data from SLTP Babarsari Yogyakarta ( Junior High School )	98/08/20
YS - 3	Data from SD Babarsari Yogyakarta ( Primary School )	98/08/20

#### VII. OTHERS

NO.	TITLE	DATE
O-1	INDONESIA Region 1 Maps (Bandung, West Java)	
O-2	INDONESIA Region 1 Maps (Surabaya, East Java)	
O-3	INDONESIA Region 1 Maps (Yogyakarta & Surakarta)	
O-4	JOURNAL OF BUILDING CONSTRUCTION & INTERIOR EDISI/MBI/1998	







NOTES

- Reference is taken from BK. 02 (E=1110.147, N=1005.147, ELY=492.477) IKIP Local Coordinated Station
- ASPHALT ROAD
  - ELITE
  - WELDRING
  - WHITE WALL
  - WHITE RAMP FOR THIS AREA
  - TRUMPET SHAPED POLE
  - BARBERS SHINE ROOM
  - POLYURETHANE LINE
  - CONTOUR LINE
  - POLE POLE
  - STONE WALL
  - RAIN WATER DRAIN
  - WHITE CHINE FERTILIZATION POLE
  - LEVEL AT CENTER OF SITE

NO	CHECKED	APPROVED	DESCRIPTION	DATE

DEPARTMENT OF EDUCATION  
REPUBLIC OF INDONESIA  
IKIP BANDUNG

PACIFIC CONSULTANTS INTERNATIONAL  
10000 10TH AVENUE, SUITE 1000, DENVER, CO 80202

PT BINA ENARCON ENGINEERING  
ARCHITECTS CONSULTANTS  
JL. PANGREH RAJAH SUDIRMAN NO. 122-122A TEL. 022-2531444

REVISION NO.	DATE	DESCRIPTION

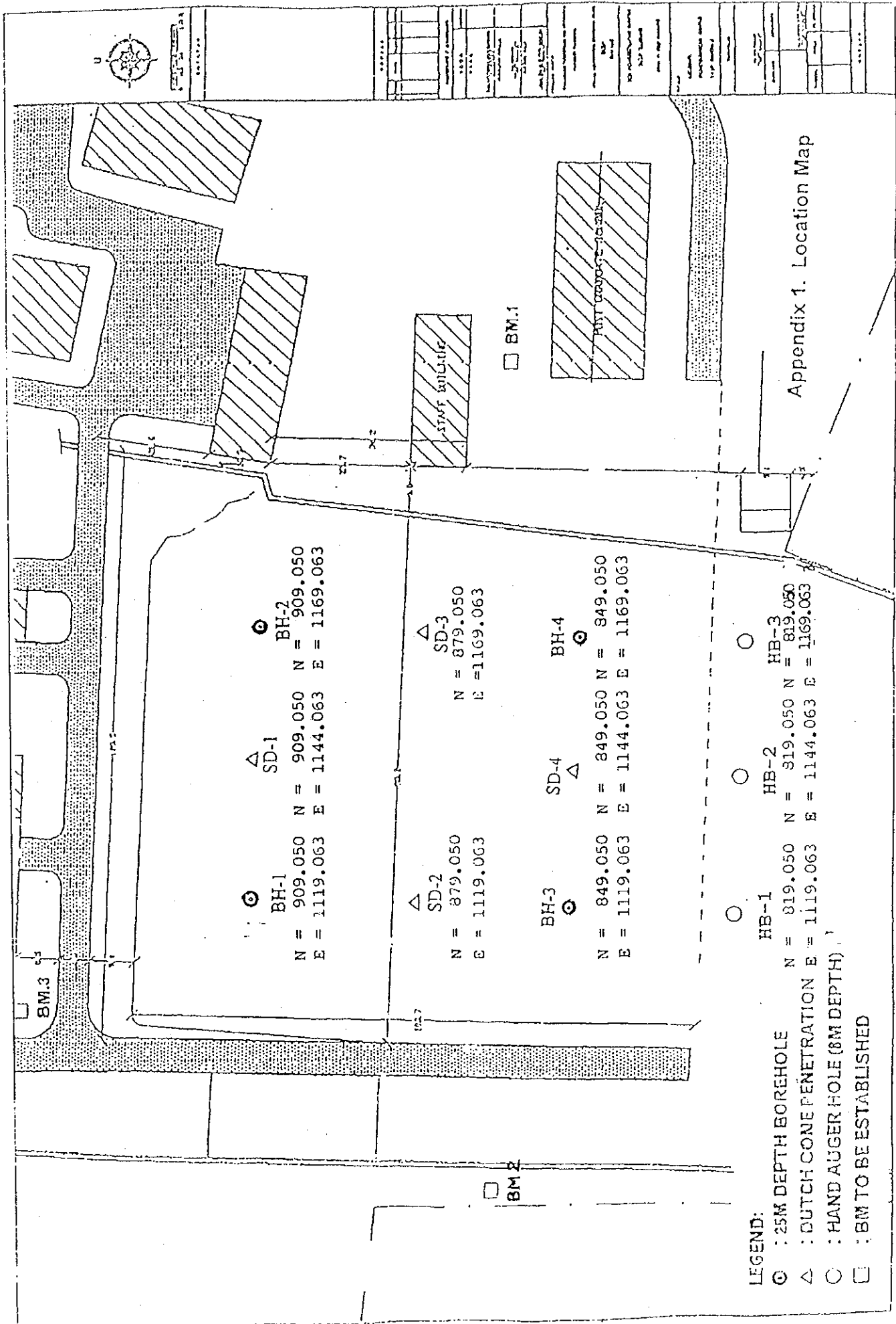
NO.	NAME	POSITION	DATE

PROJECT  
IKIP BANDUNG  
DEVELOPMENT PROJECT

DRAWING TITLE  
TOPOGRAPHICAL MAP  
AND SITE LAY OUT  
(EXISTING CONDITION)

PROJECT NO.	CONTRACT NO.	DISCIPLINE





# BORING LOG

Borehole No. : BH-1

Project : FMIPA IKIP Bandung  
 Location : IKIP Bandung  
 Northing : 909.050  
 Easting : 1.119.063  
 Elevation : +94.20 m  
 GWL : - 7.50 m

Date started : 29 September 1998  
 Date finished : 30 September 1998  
 Bor master : Hendra  
 Logged by : Tahal  
 Total depth : 25.00 m  
 Borehole diameter : 76 mm

Date	Depth (m)	Test	Symbol	Description	Lithology Unit	Standard Penetration Test													
						No. of blows		value	N Graph										
						15 cm		N	10	20	30	40	50						
29 Sept. 1998	1																		
	2	SPT		CLAYEY SILT, dark brown, soft, medium to high plasticity	TOP SOIL	1	2	2	4										
	3	UDS				1	1	2	3										
	4	SPT				1	1	2	3										
	5	SPT				1	2	2	4										
	6	SPT				1	2	2	4										
	7	SPT				1	2	2	4										
	GWL	UDS																	
30 Sept. 1998	8	SPT		SANDY SILT, tuffaceous, yellowish brown mottled grey, soft to firm, low to medium plasticity. Weathered tuff.	SILTY TUFF	1	1	2	3										
	9	UDS				1	2	1	3										
	10	SPT				1	2	2	4										
	11	SPT				2	2	4	6										
	12	SPT				2	3	5	8										
	13	SPT				4	6	7	13										
	14	SPT				6	10	17	27										
	15	SPT				9	16	35	>50										

# BORING LOG

Borehole No. : BH-1

Project : FMIPA IKIP Bandung  
 Location : IKIP Bandung  
 Northing : 909.050  
 Easting : 1.119.063  
 Elevation : +94.20 m  
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Date started : 29 September 1998  
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 Bor master : Hendra  
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 Total depth : 25.00 m  
 Borehole diameter : 76 mm

Date	Depth (m)	Test	Symbol	Description	Litology Unit	Standard Penetration Test									
						No. of blows			N Graph						
						15 cm	N	10	20	30	40	50			
30 Sept. 1998	16			breccia fragmen with angular shape at 12.10 to 12.30 m depth.	SANDY TUFF	13	19	38	>50						
	17	SPT	○	GRAVELLY SAND, tuffaceous, greyish browns mottled yellow, coarse to very coarse grain size, sub-angular to sub-rounded grain shape, very densely poorly cemented.	GRAVELLY SANDY TUFF	18	25	38	>50						
	18	SPT	○			16	27	39	>50						
	19	SPT	○			35	56	60	>50						
	20	SPT	○			53	60	>50							
	21	SPT	○			47	60	>50							
	22	SPT	○			60	>50								
	23	SPT	○			60	>50								
	24	SPT	○			60	>50								
	25	SPT	○			60	>50								
	26														
	27														
	28														
	29														
	30														











JIRA