

**MINIMUM REQUIREMENTS/CRITERIA FOR
AN INSTITUTION CONDUCTING DEGREE PROGRAM IN PHARMACY**

(Approximately for 50 students)

These criteria will be applicable to all new institutes conducting Pharmacy Program in both the Public and Private Sectors. This shall also be applicable to all those institutions, which are still awaiting recognition.

How to apply for recognition. Every Individual/institution intending to establish a pharmacy educational institution must apply for an inspection to PCP prior to advertisement for applications of admission in the First Year Class. The Advertisement can only be issued after "NO OBJECTION CERTIFICATE" is obtained by PCP. NOC will only be issued after going through the complete feasibility report and 1st inspection.

CRITERIA FOR ESTABLISHMENT OR RECOGNITION. The Council has laid down criteria for establishment /recognition of pharmacy educational institution in Pakistan which is detailed below:

- A. **Comprehensive Feasibility Report.** Any one intending to establish a pharmacy educational Institution shall submit a Comprehensive Feasibility Report, which must include the following information.
- 1. Space.** It must include all the relevant documents of possession and plan of academic blocks. Site selected should be suitable from academic point of view. Minimum requirement for total area of the Institution will be 1.0 acres.
 - 2. Infrastructure and Building.** Adequate physical facilities for Academic Blocks, Lecture Halls, Laboratories, Common Room, Cafeteria, laboratory equipment related to different laboratories, library, information technology etc. must be created by the intending institutes in an owned and purposely built building with an available carpet area of 12-15 sq. ft. per student.
 - 3. Financial Resources and Status.** The institution must be financially viable. Financial resources should be clearly indicated according to level, size and type of the proposed institution. It should be able not only to establish but also to run the institution progressively. For this purpose an endowment fund of Rs. 50 million (50% in Cash and 50% in property) should be available. Prior to the first inspection by the PCP, a Strategic Plan covering the next 5 years must be submitted that will encompass
 - Financial viability
 - Development of the infrastructure (Buildings, Laboratories, Equipments, and library)
 - Induction, training, development and higher education of Faculty.

4. Affiliation with a University and other Legal Requirements: The Institution desirous of conducting a Pharmacy degree program must have an affiliation with a recognized University (established under a charter by the Federal or Provincial Government) of the same province, which has a Faculty of Pharmacy in their principle campus. The University granting affiliation to any institution conducting any Pharmacy Degree programs shall award degrees to the students of the affiliated institution only after their facilities have been evaluated and approved for conducting said program by the PCP. The Institute should fulfill all other legal formalities, details of which will be provided in due course.

5. Organizational Structure/Faculty: Faculty should be employed full time and as per regulations for appointment laid by the PCP. The Dean/Chairman/ Director/ Principal of the Faculty/Department/Institute or College/School of Pharmacy shall hold a basic degree in Pharmacy and must be eligible for appointment as Professor/ Associate Professor. CVs of every faculty member/all members of administration/staff should be provided for scrutiny, along with terms of reference for employment, qualifications, professional and teaching experience, date of joining, designation with details of research publications etc. etc. The Institutions offering a Degree program shall have the faculty strength as per following:

Professor	10%
Associate Professor	20%
Assistant Professor	30%
Lecturers	40%

6. Library: Library should be well equipped with sufficient number of books, latest editions of reference books/journals, computers with internet facilities and photocopying facility as per following:

- **Books:** *At least 1500 with adequate coverage of all disciplines and specialties of Pharmacy. Minimum of 3-5 copies of each recommended books should be available in the Library.*
- **Annual Addition of Books:** *100 to 150 books.*
- **Periodicals:** *At least 5 including 3 international.*

7. Attached Hospital. The attached hospital for imparting training in clinical pharmacy should be well equipped and functional. The hospital should have a minimum 100 beds for admission of 50 students. The hospital must be well reputed with all the major disciplines along with well equipped operation theatres and supportive services should be fully and freely available.

B. SCRUTINY OF APPLICATIONS. The application for recognition must be submitted on a prescribed Performa, with details along with the fee prescribed for this purpose before undertaking the first inspection by the Council.

The application will be scrutinized according to the laid down criteria. The Secretariat will ensure rectification of deficiencies or otherwise for approval by the Council or any relevant Committee for appointment of the Inspection Team. If approved, the inspection in question would be undertaken according to the following:

- i) All institutions, trying to get themselves established and wanted to advertise for admission of students in a pharmacy program, ought to be informed that they should submit applications for inspection before establishment of the institution.
- ii) In case they have failed to submit the application before the advertisement, then it should be mandatory that the newly established institution must apply to the Pharmacy Council of Pakistan to carry out the inspection before conducting the 1st year professional examination (this is only applicable to those colleges who had established before these criteria were published).
- iii) Depending upon the report submitted on initial scrutiny of the application, the Council or relevant Committee may arrive at the following decisions:

The institution may be informed of the deficiencies detected on scrutiny, and asked to resubmit the request after removing the deficiencies for inspection. It is mandatory that revised application be submitted before conducting the first professional examination, failing which the PCP will bear no obligation to conduct inspection at later stages. The scrutiny team must ensure that the requirements laid down are duly approved by the Council and are available in the institution.

The Pharmacy Council of Pakistan will have to scrutinize the applications within 6 months from the date of application.

C. INSPECTION TEAM. The inspection team will be constituted by the Council comprising of members from academia and other disciplines of the profession. The Inspection team will be accompanied by the Secretary, PCP or one of its representative.

D. INSPECTION SCHEDULE. Inspection of all relevant facilities should be conducted for concerned year of training at the times given below. The objectives for each visit are mentioned below and the details are present in the forms.

VISIT 1: 1st comprehensive Inspection prior to first admission of the students for granting NOC.

Objectives: The Inspection team will look into the following in addition to the criteria already given.

- Suitability of the venue for educational purposes.
- Availability of all necessary basic infrastructure and physical facilities needed during the first two professional years.
- Presence of needed basic educational resources.
- Recruitment of appropriate and adequate teaching faculty.
- Availability of written curriculum.
- Adequacy and sources of Funds.
- Procedure for financial accountability.

Visit 2: At the time of first Professional Examination (semester/annual).

Objectives: The Inspection team would observe

- Relevance of assessment to the objectives of training for the year.
- Presence of all required basic educational resources.
- Recruitment of appropriate and adequate teaching faculty.

- Availability of appropriate and adequate number of examiners.
- The Conduct of examination and Report on the transparency and fairness of the examination.

Visit 3: Beginning of the 3rd year or third professional (5th semester)

Objectives: The Inspection would look into.

- Availability of all necessary infrastructure and physical facilities needed during the second professional in the pharmacy institution.
- Presence of needed educational resources
- Recruitment of appropriate and adequate teaching faculty.
- Availability of written training program with objectives, syllabus, teaching methods and assessment program.

Visit 4: At the time of final professional examination.

Objectives: The Inspection Team would observe:

- Availability of all necessary infrastructure and physical and curricular facilities needed during the whole program
- The Conduct of examination. Adequacy of Clinical training opportunities and clinical faculty required for conducting the said training.
- Relevance of assessment to the objectives of training for the whole program in the Institution and the affiliated Hospital.

In addition to the above, the Council can also conduct surprise inspections of the Institutions.

The Pharmacy Programs of the Institutions which are recognized by the Council will be visited after every three years to ensure that the standards based on which institution was granted recognition, are maintained or not.

LIST OF MINIMUM REQUIREMENTS OF PHYSICAL FACILITIES FOR A PHARMACY DEPARTMENT

(approx for 50 students)

I- BASIC REQUIREMENTS (HEC General Criteria for Establishment of Degree Awarding Institute)

- 2 lecture rooms
- 1 seminar room
- 1 library cum Reading room with Photocopier
- 1 committee room
- Teacher Students ratio 1:10

II- LECTURE THEATERS:

	No.	Capacity	Dimension
• Under Graduate(1 st -5 th Prof)	5	50 students	600-750 sq feet each

III-LABORATORIES

1- PHARMACEUTICS LABORATORY:

Dimensional Requirement	No.	Capacity	Workshops (desirable)
Under graduate Laboratory	1	50 students	1750-2250 sq feet each

SUBJECTS REQUIRING SUCH FACILITY

- a. Pharmaceutical technology
- b. Physical pharmacy
- c. Bio-pharmaceutics
- d. Pharmaceutics
- e. Dispensing & Community Pharmacy
- f. Instrumentation & Quality Control

2- PHARMACOGNOSY LABORATORY:

Dimensional Requirement	No.	Capacity	Workshops (desirable)
Under graduate Laboratory	1	50 students	1750-2250 sq feet each

SUBJECTS REQUIRING SUCH FACILITY

- a. Pharmacognosy- I
- b. Pharmacognosy- II

3- BASIC MEDICAL SCIENCES LABORATORY:

Dimensional Requirement	No.	Capacity	Workshops (desirable)
Under graduate Laboratory	1	50 students	1750-2250 sq feet each

- Animal room having capacity to accommodate large and small animals
- Anatomy museum

SUBJECTS REQUIRING SUCH FACILITY

- a- Physiology
- b- Pharmacology
- c- Anatomy

4- PHARMACEUTICAL CHEMISTRY LABORATORY:

Dimensional Requirement	No.	Capacity	Workshops (desirable)
Under graduate Laboratory	1	50 students	1750-2250 sq feet each

SUBJECTS REQUIRING SUCH FACILITY

- a- Bio-chemistry Laboratory.
- b- Organic Chemistry Laboratory
- c- Medicinal Chemistry Laboratory

5- PHARMACEUTICAL MICROBIOLOGY LABORATORY:

Dimensional Requirement	No.	Capacity	Workshops (desirable)
Under graduate Laboratory	1	50 students	1750-2250 sq feet each

SUBJECTS REQUIRING SUCH FACILITY

- a- Pharmaceutical Microbiology
- b- Pathology

6- INDUSTRIAL LABORATORY:

Dimensional Requirement	No.	Capacity	Workshops (desirable)
Under graduate Laboratory	1	50 students	1750-2250 sq feet each

SUBJECTS REQUIRING SUCH FACILITY

- a- Industrial Pharmacy

7- INSTRUMENTATION & QUALITY CONTROL LABORATORY:

Dimensional Requirement	No.	Capacity	Workshops (desirable)
Under graduate Laboratory	1	50 students	1750-2250 sq feet each

SUBJECTS REQUIRING SUCH FACILITY

- a- Instrumentation & quality control
- b- Pharmaceutical quality management

8- COMPUTER LABORATORY:

Dimensional Requirement	No.	Capacity	Workshops (desirable)
Under graduate Laboratory	1	50 students	1750-2250 sq feet each

- Minimum of 15 Computers (1 computer for each 3 students)
- Internet Source, Online Services, Access to HEC journals & E-library
- Minimum of 256 Kbytes access rate shall be provided

SUBJECTS REQUIRING SUCH FACILITY

- a- Computer and its Applications in Pharmacy
- b- Online Drug Information Resources (Clinical Pharmacy)

9- AFFILIATED HOSPITAL FACILITY:

- Minimum of 250 Bed
- With well established Medical departments
- Established Hospital Pharmacy Services
- Full time Pharmacists proportionate to bed strength (i.e. one pharmacist for 50 beds.
- Full time Staffed Professor of Medicine as Clinical Training Coordinator

SUBJECTS REQUIRING SUCH FACILITY

- a- Clinical Pharmacy-I
- b- Clinical Pharmacy-II

LIST OF MINIMUM REQUIREMENTS FOR HOSPITAL FOR IMPARTING TRAINING IN CLINICAL PHARMACY

(Approximately for 50 students)

I- BASIC REQUIREMENTS:

a) Dimensional Requirement:

- Minimum of 100 Beds

b) Services:

- Central Pharmacy
- Satellite Pharmacies at departmental level
- Dispensing & Compounding Services
- Pharmacy & Therapeutic Committee
- Essential Drug List & Formulary Management Services.

c) Facilities:

- Adjoining Class rooms/ Patient Presentation sites in each ward with a minimum capacity for accommodating 25 students.
- Sufficient Library/ Professional Information access.
- White Board, fixtures & other teaching aids.

d) Departments:

- Emergency Department
- Medicine/ Medical
- Pediatric Care Unit
- Cardiology
- Ear, Nose, Throat (ENT)
- Dermatology
- Neurology Ward
- Surgical Unit.

II- REQUIREMENTS FOR TECHNICAL & PROFESSIONAL STAFF

a) Numbers

- One Consultant in each ward
- One Registrar at least in each ward
- One Pharmacist at least in each ward.

b) Qualification

- Head of Department & Incharges (F.C.P.S.)
- Registrar/ Post Graduate Registrar (MBBS with Part-1)
- Pharmacist (B. Pharmacy / Doctor of Pharmacy)

NOTE: The above mentioned facilities may be relaxed in the areas where teaching hospitals are not available.

III- MODE OF IMPARTING TRAINING:

- Attend students in each respective wards
- Maintaining Discipline and their attendance.
- Conducting lectures/ illustrations/ presentations of Syllabus concerned.
- Presenting patients with different clinical situations

- Discuss pathological and pharmacotherapy with medical prescriber, Pharmacist and students
- 10 short cases in the 4th Prof. (7th & 8th semester).
- 10 long cases in the 5th Prof. (9th & 10th semester).

IV- FACULTY REQUIREMENT

- All the academic staff will hold basic degree in Pharmacy except in the subjects of Pathology, Physiology/Histology, Anatomy, Computer Science, Islamic Studies, Pakistan Studies, Social Studies, Management Studies, English, and Mathematics . In these subjects the teachers may be employed as visiting faculty.
- The Dean/Director/Principal/Chairman shall hold a basic degree in Pharmacy and will be eligible for appointment as Professor or at least Associate Professor.
- The
- Experience of the Teaching Faculty at the time of appointment
 - No more than 10% of the Teaching Faculty will be Pharmacy Graduates with less than 3 Years of teaching experience in the relevant subject or 5 Years of experience in Pharmacy Practice/Pharma Industry/Drug Regulation.
 - No less than 10% of the Teaching Faculty will be permanent and holding PhDs in the relevant subject

V-COMMON REQUIREMENTS

- Auditorium having a capacity of **500 students**
- Computer laboratory having a capacity of **50 students (60*30 feet)**
- Conference room (teachers) having capacity of **50 seats (60*35 feet)**
- Centralized research laboratory consisting of **3 rooms each of measurement (80*35 feet)**
- Girls common room (as per HEC criteria)
- Boys common room (as per HEC criteria)
- Library (**140*70 feet**)
- Staff room (**50*30 feet**)
- Prayer room (**60*60 feet**)
- Stores Required
 - a) Main store (**50*30 feet**)
 - b) Chemical store (**60*40 feet**)
 - c) Glass ware store (**60*40 feet**)
 - d) Common store (**100*60 feet**)
- Washrooms for
 - a) Male and female Teachers
 - b) Boys and girls.

VI- OFFICES / ADMINISTRATION REQUIREMENT

OFFICES	No.
• Chairman office	1
• Clerical offices	1
• Staff room	1
• Faculty office for each depart:	1
• Professors	1
• Associate professors	1
• Assistant professors	2

LIST OF MINIMUM REQUIREMENTS OF EQUIPMENTS IN GRADUATE LABORATORIES OF PHARMACY DEPARTMENT (approximately for 50 students)

A- Graduate Laboratory.

- i) Bio-chemistry Laboratory.
- ii) Organic Chemistry Laboratory
- iii) Medicinal Chemistry Laboratory
- iv) Pharmaceutics Laboratory
- v) Dispensing & Compounding Laboratory
- vi) Instrumentation Laboratory
- vii) Pharmacology Laboratory
- viii) Physiology Laboratory
- ix) Pharmaceutical Microbiology Laboratory
- x) Industrial Pharmacy Laboratory
- xi) Pharmacognosy Laboratory

A- Graduate Laboratory

1-Bio-chemistry / Organic / Inorganic Laboratory (approx for 50 students)		
S. No.	Name of Instruments	Quantity
1	Water bath single hole	10
2	Triple beam balance	5
3	Microscope	15
4	Water bath	10
5	Balance digital balance	2
6	Melting Point Apparatus	10
7	Spectrophotometer	2

2- Pharmaceutics / Dispensing Laboratory (approx for 50 students)		
1	Triple beam balance	5
2	Water bath	10
3	Cold & Hot Incubator	1

3- Pharmacology/ Physiology Laboratory (approx for 50 students)		
1	Haemometer set	8
2	Tissue organ bath	15
3	Kymograph	15
4	Triple beam balance	5
5	Digital balance	2
6	Microscope	15
7	Oven	1
8	Burner	15
9	Barometer	5
10	E.S.R stand	15
11	Spiro meter plastic body	5
12	Western Green Tubes	15
13	Glass Test Tubes	100
14	Test Tub stands	20
15	Neubar Chamber 0.0025mm ²	10
16	RBC Pipette	10
17	WBC Pipette	15
18	Snellen's Chart(Eye)	10
19	Meter rod	10
20	Sphygmomanometer	15
21	Stethoscope	15
22	Sahli's haemometer	10
23	Wet Spiro meter	5
24	Perimeter With Object	10
25	ECG machine	1

26	Wattmann Filter paper	10 pack
27	Antiserum A B & D	5 Complete sets
28	Histology Slides	All Basic
29	Weight Machine	2

4- Microbiology Laboratory (approx for 50 students)		
1	Autoclave	2
2	Cool incubator	1
3	Hot incubator	1
4	Laminar air flow Horizontal	1
5	Laminar air flow Vertical	1
6	Oven	2
7	Microscopes Compound	15
8	Reciprocating Shaker	1
8	Deep freezer	1

5-Pharmacognosy Laboratory (approx for 50 students)		
1	Centrifuge machine	2
2	Microscope	15
3	Microtome	1
4	Oven	2
5	Water bath 4 holes	6
6	Rota Evaporator + Chiller	3+1
7	Aspirator	1

6- Industrial Laboratory (approx for 50 students)		
1	Powder Filling Machine	1
2	Single Punch Tablet Machine	1
3	Coating Pressure Tank	1
4	Sigma Blade Mixer	1
5	Friability Test Apparatus	1
6	Dissolution Apparatus	1
7	Dissolution Apparatus (6) Basket	1
8	Disintegration Apparatus Single Vessel	1
9	Disintegration Double vessel	1
10	Syrup Filling Machine	1
11	Colloidal Mill	1
12	Capsule Filling Machine	1
13	Silverson Mixer	1
14	Ampoule gasses	1
15	Oven	1
16	Ointment Filling Machine	1
17	Mechanical Stirrer	1

18	Rotary Press	1
19	Wet Granulator	1
20	Dry Granulator Disintegrator	1
21	Automatic Ampoule filling machine	1
22	Tray dryer	1
23	Digital weight balance	1
24	Furnace	1
25	Ball Mill	1
26	Mechanical Stirrer	1
27	Filter Press	1
28	Water Deionizer Plant	1
29	Disintegration single vessel	1
30	Tablet coating conventional pans	2
31	Canvas line pan	1
32	Single blade mixer	1
33	Distillation apparatus (Gas)	1
34	Centrifuge	1
35	Vernier Caliper	1
36	Screw capping & Sealing machine	1

7-Instrument Room. (approx for 50 students)		
1	UV Spectrophotometer Double Beam	1
2	IR Spectrophotometer	1
3	Flame photometer	1
4	Digital Dissolution Apparatus & Auto sampler	1
5	Polari meter	1
6	Digital Incubator	1
7	Digital Moisture analyzer	1
8	Digital hardness tester	1
9	Kenwood Planetary Mixer	1
10	UV Spectrophotometer Single Beam	1
11	Magnetic Stirrer+ Hot Plate	1
12	Digital Weight balance	1
13	Magnetic stirrer	1
14	Vortex Mixer	1
15	pH Meter	1
16	Centrifuge Machine	1
17	Stability chamber	1
18	Oven	1
19	Deep Freezer	1
20	Refrigerator	1
21	Incubator	1
22	Water Distillation Unit	1
23	Water deionizer	1

10- Library: 35* 60 feet (approx for 50 students)			
Subject-wise books requirement: .			
SUBJECT	Copies	SUBJECT	Copies
Analytical Chemistry	10 each	Anatomy	10 each
Biochemistry	10 each	Bio Pharmaceutics	10 each
Clinical Pharmacy	10 each	Compendia's	1 each
Dictionary	1 each	Dispensing	10 each
Drug Law	10 each	Forensic	10 each
Hospital Pharmacy	10 each	Industrial pharmacy	10 each
Pharmaceutical Chemistry	10 each	Math	5 each
Management	10 each	Medicinal chemistry	10 each
Microbiology	10 each	Organic chemistry	10 each
Pharmaceutics	10 each	Pharmacognosy	10 each
Pharmacology	10 each	Physical Pharmacy	10 each
Physiology	10 each	Quality Control	10 each
Statistics	5 each		
Professional Magazines & Writings:		Quantity Sufficient	
Research Journals:		Quantity Sufficient	

17) Students and teacher ratio

1:10 (as per HEC Criteria)

**MINIMUM REQUIREMENTS OF CHEMICALS
FOR UNDER-GRADUATE LABORATORIES**

(Approximately for 50 students)

S. No.	Chemicals	Minimum Quantity In hand (approx for 50 students)
1.	Ammonia	20 L
2.	Ammonium chloride	2 Kg
3.	Acetic acid	25 L
4.	Acetyl salicylic acid	3 Kg
5.	Acetone	15 L
6.	Atropine sulphate	25 gm
7.	Anise oil	1 Lb
8.	Aniline	5 L
9.	Acetanilide	1 Kg
10.	Aluminium chloride	1 Kg
11.	Acetyl chloride	1 L
12.	Acriflavine	1 Pack
13.	Acetamide	1 Kg
14.	4-amino phenol	250 gm
15.	Acetophenone	1 L
16.	Aspartic acid	100 gm
17.	4-amino benzoic acid	250 gm
18.	2-acetyl salicylic acid	1 kg
19.	Amm. Bicarbonate	2 kg
20.	Ammonium molybedate	1 kg
21.	Amaranth	2 kg
22.	Accacia gum	10 Kg
23.	Acid fuchsin ind.	250 ml
24.	Anthrone	50 gm
25.	Arabinose	10 gm
26.	Adipic acid	1Kg
27.	Aluminium hydroxide	1 Kg
28.	Ascorbic acid	1 Kg
29.	Arginine	100 gm
30.	Albumin(bovine)	500 gm
31.	Anthracene	250 gm
32.	Acetyl choline	25 gm
33.	Aspirin power	2 Kg
34.	Alanine	50 Gm
35.	Aluminium sulphate	1 gm
36.	Amyl alcohol	1 L
37.	Amm iron II sulphate	1Kg
38.	Asparagines	25 gm
39.	Almond bitter oil	2 L

40.	Adernaline voil	25 ml
41.	Alizarine red	25 gm
42.	Amm.sulphate	1 kg
43.	Arachis oil	1 L
44.	Amm oxalate	1 kg
45.	Agarose	10 g
46.	Acrylamide	1 kg
47.	Acetonitril	2.5 L
48.	Aluminium oxide	1 Kg
49.	Adenosine tri phosphate	100 gm
50.	Calcium carbonate	1 kg
51.	Copper sulphate	2 kg
52.	Citric acid	1 kg
53.	Carbon tetra chloride	10 L
54.	Chloroform	10 L
55.	Cupric sulphate	1 Kg
56.	Cupric acetate	1 Kg
57.	Cinamic acid	1 kg
58.	Coumarin	1 kg
59.	Cupric oxide	1 kg
60.	Chloro acetic acid	1 kg
61.	Caffeine	1 Lbs
62.	Calcium lactate	2 Kg
63.	Crystal violet	100 gm
64.	Chloral hydrate	2 Kg
65.	Charcoal animal	1 Kg
66.	Camphor	2 Kg
67.	Calcium chloride	2 Kg
68.	Creatinine	25 gm
69.	Cetomacrogol	1 kg
70.	Coriander oil	1 L
71.	Cod liver oil	1 L
72.	Calamine	2 Kg
73.	Ceric amm sulphate	25 gm
74.	Chloramines	1 L
75.	Cyclo hexane	5 L
76.	Cystine	25 gm
77.	Clove oil	1 Lbs
78.	Carmine	1 Lbs
79.	Cedar Wood Oil	1 L
80.	Cinnamon oil	1 L
81.	Caster oil	5 L
82.	Cardamom oil	1 L
83.	Caraway oil	1 L
84.	Calcium hydroxide	2 Kg

85.	Canada balsam	1 L
86.	Calcium acetate	1 Kg
87.	Cetyl alcohol	2 Kg
88.	Cobalt chloride	500 gm
89.	Cobalt nitrate	500 gm
90.	Congo red	50 gm
91.	Cresol red solution	50 gm
92.	Cellulose	1 kg
93.	Cadmium chloride	250 gm
94.	Chloro benzene	2.5 L
95.	Carbapol	1 Kg
96.	Calcium phosphate	1 kg
97.	Calcium sulphate	1 kg
98.	Calcium stearate	1 kg
99.	Carboxy methyl cellulose	2 kg
100.	Cellulose acetate phthalate	1 kg
101.	Carnauba black wax	1 kg
102.	Calcium oxide	1 kg
103.	Capillary tube	10 Packet
104.	Celite powder	1 kg
105.	Coconut oil	1 kg
106.	Carbal fuchine	500 ml
107.	Di pot.hydrogen phosphate	2 kg
108.	Di methyl aniline	1 L
109.	Di phenylamine	1 kg
110.	Di oxane	2.5 L
111.	Di methyl formamide	2.5 L
112.	Di sod phosphotungstate	250 gm
113.	Di sod tartarate	1 kg
114.	2-6-dichloro phenol indophenol	25 gm
115.	Dextrose powder	1 kg
116.	Di ethylamine	1 L
117.	Di sod di hydrogen phosphate	5 kg
118.	Dextrine	1 kg
119.	Dextrine blue	100 gm
120.	Di methyl sulphoxide	2 L
121.	Di chloro methane	5 L
122.	Di phenyl carbazide	20 gm
123.	Diclofenac sodium	500 gm
124.	Di pot di hydrogen phosphate	2 kg
125.	Ethyl acetate	5 L
126.	Ethanol	20 L
127.	Erichrome black	25 gm
128.	Ethylene diamine tetra acetic acid	1 kg
129.	Ether solvent	5 L

130.	Eosine(stain)	25 gm
131.	Ethylene glycol	1 L
132.	Ethylene diamine	1 L
133.	Ethyl cellulose	1 kg
134.	Eudragit-L-100	1 Kg
135.	Emyluesifing wax	1 kg
136.	Glucose	10 kg
137.	Glactose	1 kg
138.	Glycine	500 gm
139.	Glutaric acid	500 gm
140.	Gallic acid	500 gm
141.	Glycerine	10 L
142.	Gum Arabic	1 Kg
143.	Gelatin	1 kg
144.	Glutamic acid	500 gm
145.	Gram's staining	500 gm
146.	Giemsa stain	500 ml
147.	Glutamine	500 ml
148.	Glass wool	2 kg
149.	Glass slide	50 packs
150.	Glass cover slip	50 packs
151.	Hydrogen per oxide	1 L
152.	Hydro chloric acid	10 L
153.	Hydroquinone	1 kg
154.	Hydroxylamine hydro chloride	1 kg
155.	Heavy kaoline	5 kg
156.	Hydroxyl praline	25 gm
157.	Histidine	25 gm
158.	8-hydroxy quinoline	50 gm
159.	Hydroxyl ethylene cellulose	1 kg
160.	Hydroxy propyl methyl cellulose	500 gm
161.	Hydroxyl ethyl cellulose	500 gm
162.	4-hydroxy benzoic acid	100 gm
163.	Iodine	1 kg
164.	Idoform	1 kg
165.	Isatin	2 kg
166.	Kiesulgahr	10 pack
167.	Litmus paper blue	10 pack
168.	Litmus paper red	25 gm
169.	Litmus blue powder	25 gm
170.	Lemon oil	1 L
171.	Lactose	5 kg
172.	Lead acetate	1 kg
173.	Lenoline	1 kg
174.	Leishman stain	500 ml

175.	Light green	100 gm
176.	Light magnesium carbonate	5 kg
177.	light magnesium oxide	3 kg
178.	Light kaoline	5 kg
179.	Leucine	25 gm
180.	Methyl red	25 gm
181.	Methyl orange	25 gm
182.	Magnesium sulphate	1 kg
183.	Malic acid	1 kg
184.	Malonic acid	500 gm
185.	Maleic acid	1 kg
186.	Methanol	10 L
187.	Maltose	1 kg
188.	Malachite green	25 gm
189.	Mercuric acetate	250 gm
190.	Methyl blue	25 gm
191.	Methyl cellulose(20)	10 kg
192.	Methyl hydroxyl benzoate	1 kg
193.	Mercuric chloride	500 gm
194.	Magnesium chloride	1 kg
195.	Methyl salicylate	5 L
196.	Magnesium tri salicate	1 kg
197.	Methyl acetate	1 L
198.	Macconkey agar	500 gm
199.	Mannitol	500 gm
200.	Methionine	25 gm
201.	Menthol	500 gm
202.	Magnesium stearate powder	2 kg
203.	Mineral oil	3 L
204.	Micro crystalline cellulose	1 kg
205.	Methyl paraben	500 gm
206.	Magnesium carbonate	2 kg
207.	Mustard oil	1 L
208.	Magnesium oxide	500 gm
209.	N-butanol	5 L
210.	n-hexane	5 L
211.	Nitric acid	10L
212.	2-nitro phenol	25 gm
213.	4-nitro phenol	25 gm
214.	1-naphthol	1 kg
215.	2-naphthol	1 kg
216.	1-naphthyle amine	1 kg
217.	Ninhydrin	50 gm
218.	Nutmeg oil	1 L
219.	Nitro benzene	2.5 L

220.	Nutrient broth	500 gm
221.	Nickel chloride	250 gm
222.	Naphthalene	500 gm
223.	Nutrient agar	500 gm
224.	Orange oil	1 L
225.	Oleic oil	2 L
226.	Oxalic acid	2 kg
227.	Orcinol	25 gm
228.	Olive oil	2 L
229.	Pot.di hydrogen phosphate	5 kg
230.	Pot.dichromate	1 kg
231.	Pot.permaganate	1 kg
232.	Pyridine	2 L
233.	Phenol red	25 gm
234.	Phenolphthalein	500 gm
235.	Paraffin oil	20 L
236.	Pot. Iodide	1 kg
237.	Phenyl hydrazine hydro chloride	500 gm:
238.	Pot. hydrogen phosphate	1 kg
239.	Pot. Meta bi sulphate	250 gm
240.	Pthalic anhydride	500 gm
241.	Pyrocatechol	1 kg
242.	Phenol	1 kg
243.	Pot.Hydride	3 kg
244.	Pyrogallol	1 kg
245.	Phloroglucinol	100 gm
246.	Pot.chromate	1 kg
247.	Phenyl urea	25 gm
248.	Pot.Thiocyanate	1 kg
249.	Phthalimide	1 kg
250.	Pot.sod.tartrate.	2 kg
251.	Phenacetine	100 gm
252.	Pot.hydrogen phthalate	500 gm
253.	Picric acid	500 gm
254.	Petroleum ether	2.5 L
255.	Pot.chloride	3 kg
256.	Paraffin soft	5 kg
257.	Paraffin hard	5 kg
258.	Per chloric acid	1 L
259.	Phosphotungstic acid	250 gm
260.	Petroleum jelly	5 kg
261.	Propylene glycol	5 L
262.	Poly sorbate	500 mg
263.	Proline	25 gm
264.	O-phosphoric acid	2.5 L

265.	Pot.citrate	500 gm
266.	Petroleum ether	5 L
267.	Pot.bromide	500 gm
268.	Palmitic acid	1 kg
269.	2-propanol	10 L
270.	Poly ethylene glycol(400)	1 L
271.	Poly ethylene glycol(4000)	1 kg
272.	Poly ethylene glycol(8000)	1 kg
273.	Poly ethylene glycol(200)	1 L
274.	Pot.carbonate	2 kg
275.	Pot.ferrocyanide	500 gm
276.	Pot.nitrate	500 gm
277.	Pot.sulphate	500 gm
278.	Poly vinyl alcohol	1 kg
279.	Poly ethylene	1 kg
280.	Poly vinyl chloride	1 kg
281.	Poly vinyl pyrolidone	1 kg
282.	p.v.p crosslinked	1 kg
283.	Povidon	1 kg
284.	Pot.floride	500 gm
285.	Peppermint	2 L
286.	Paracetamol	1 kg
287.	Propyl paraben	500 gm
288.	Resorcinol	25 gm
289.	Rose oil	1 L
290.	Raspberry.	1L
291.	Sod. Carbonate	5 kg
292.	Sod.hydroxide	5 kg
293.	Sod.bi carbonate	3 kg
294.	Salicylic acid	2 kg
295.	Starch	2 kg
296.	Sod.acetate	1 kg
297.	Sucrose	1 kg
298.	Sod.thio sulphate	1 kg
299.	Sulphanilic acid	500 gm
300.	Sod nitropruside	250 gm
301.	Succinic acid	1 kg
302.	Succinamide	500 gm
303.	Sod.hydrogen sulphate	500 gm
304.	Silica gel	2 kg
305.	Salicyladehyde	500 gm
306.	Sod. Sulphate	2 kg
307.	Sod.benzoate	500 gm
308.	Sod.metal	1 kg
309.	Sod. Nitrite	500 gm

310.	Silver nitrate	25 gm
311.	Sod. Nitrate	500 gm
312.	Saffranine	25 gm
313.	Borax	1 kg
314.	Sulphuric acid	10 L
315.	Sod.citrate	500 gm
316.	Sublimed sulphur	500 gm
317.	Sod.chloride	5 kg
318.	Saccharine	1 kg
319.	Sorbitol	500 ml
320.	Sod. Molybdate	500 gm
321.	Silica gel moisture	1 kg
322.	Sod.acid phosphate	500 gm
323.	Sod. Sulphite	500 gm
324.	Stearic acid	2 kg
325.	Sod.di hydrogen phosphate	1 kg
326.	Sod.lauryl sulphate	5 kg
327.	Sod.salicylate	3 kg
328.	Sun flower oil	1 L
329.	Sod bromide	500 gm
330.	Sulphanilamide	250 gm
331.	Sod tungstate	250 gm
332.	Sod carboxy methyl cellulose	2 kg
333.	Sod floride	500 gm
334.	Tartaric acid	4 kg
335.	Thio urea	2 kg
336.	Toluene	5 L
337.	Thymol	100 gm
338.	Turpentine oil	5 L
339.	Tannic acid	1 kg
340.	Tincture of benzoin	500 ml
341.	Tragacanth	1 kg
342.	Triethylamine	1 L
343.	Tri chloro acetic acid	250 gm
344.	Tryptophan	25 gm
345.	Tyrosine	25 gm
346.	Tri. Sod. Citrate	500 gm
347.	Tincture cardamom	500 ml
348.	Titanium di oxide	500 gm
349.	Talcum	5 kg
350.	Thymol blue	25 gm
351.	Tween-80	1 L
352.	Triethanolamine	1 L
353.	Tin granular	200 gm
354.	Universal ph paper	10 packs

355.	Urea	1 kg
356.	Vaniline	25 gm
357.	Valine	25 gm
358.	Whatman filter paper	5 packs
359.	Wool fat	2 kg
360.	Wool alcohol	2 kg
361.	Xylose	25 gm
362.	Xylene (xylol)	2.5 L
363.	Zinc sulphate	1 kg
364.	Zinc powder	1 kg
365.	Zinc chloride	500 gm
366.	Zinc oxide	500 gm
367.	Zn staining	500 ml
368.	Zein	100 gm
369.	Zinc metal (granulated)	500 gm
370.	Boric acid	1 kg
371.	Benzene	5 L
372.	Bromine	1 L
373.	Benzil	500 gm
374.	Benzamide	500 gm
375.	Biphenyl	1 kg
376.	Benzaldehyde	500 gm
377.	Benzoyl chloride	1 L
378.	Beeswax	1 kg
379.	Benzyl chloride	1 L

**MINIMUM REQUIREMENTS OF GLASSWARE
FOR UNDER-GRADUATE LABORATORIES**

(Approximately for 50 students)

S. No.	Items	Minimum Quantity Required (approx for 50 students)
1.	3-neck R. B. flask (100 & 250 ml)	30
2.	Air condenser	20
3.	Air steam inlet tube	50
4.	Buchner filter funnel	20
5.	Buchner funnel	10
6.	Burettes Borosilicate glass	15
7.	China crucible	15
8.	China dish	30
9.	Condenser	20
10.	Cone MF 15/2	20
11.	Cone MF 15/1	20
12.	Conical Flask Flat Bottom (Various Capacities)	50
13.	Desiccator	10
14.	Desiccator plates	15
15.	Drying tube bent	15
16.	ESR westergren tube	15
17.	Filter flask	15
18.	Funnels	30
19.	Gas washing bottle	30
20.	Glass cover slip	10 pack
21.	Glass slide plain	10 pack
22.	Gloves	50
23.	Graduated Cylinder (Various capacities)	50
24.	Graduated pipette	30
25.	Graduated pipettes, Pyrex (Various capacities)	30
26.	Hollow stopper	15
27.	Iron stand clamp	30
28.	Liebig condenser	15
29.	Magnetic stirrer bar	10
30.	Markham still	15
31.	Melting point apparatus	15
32.	Micro Pipettes Adjustable	15
33.	Multiple adapter	15
34.	Pestle & mortar	15
35.	Petri dish	50
36.	Pycnometer	30
37.	Pipette filter	30
38.	R.B.C pipette	30

39.	R. B. flask	30
40.	R. flask	30
41.	Reagent bottle	100
42.	Receiver adopter	30
43.	Receiver bend with vent	30
44.	Receiving flask	20
45.	Round Bottom Flask (Various capacities)	30
46.	Socket	20
47.	Soxhlet apparatus	15
48.	Spatula	20
49.	Spatula small steel	20
50.	Stop cork assembly	20
51.	Syringe disposable	10 pack
52.	Test Tube 1/ 1000	10 Pack
53.	Volumetric Flasks Glass (Various capacities)	10 each
54.	W.B.C. pipette	20
55.	Water taps	20
56.	Capillary tube	10 pack
57.	Fusion tube	10
58.	Test tube (5 ml & 25 ml)	10 pack each
59.	Funnel plane angle (60 mm & 80 mm)	20
60.	Thermometer (100 C/ 110 C, 360C & 340C)	10 each
61.	Water distillation plants (Electric)	2 minimum
62.	Beaker (50, 100, 250, 1000 & 2000 ml)	20 each
63.	Separating funnel (100 ml & 250 ml)	10 each
64.	Funnel plain (100 ml)	10 each
65.	Measuring flask (50, 100, 250, 500 & 1000 ml)	10 each
66.	Volumetric pipette (10 & 20 ml)	10 each
67.	Titration flask (50, 100 & 250 ml)	10 each
68.	Burette (10 & 50 ml)	10 each
69.	Measuring cylinder (10, 50, 100 & 250 ml)	15 each
70.	Condenser (14/23, 19/26 & 24/29)	10 each
71.	Round bottom flask (50, 100 & 1000 ml)	10 each
72.	3-neck round bottom flask (100 & 250 ml)	10 each
73.	Receiving flask (50, 100 & 250 ml)	10 each
74.	Desiccator (140, 200 mm, 150 ml)	5 each
75.	Desiccator plate	10
76.	Pycnometer (10, 25 & 50 ml)	10 each
77.	Glass washing bottles (250 ml)	15 each
78.	Cone MF 15/1 and 15/2 (14/23, 19/26)	15 each

79.	Dropping bottle (125 ml)	15 each
80.	Viscometer	15
81.	Watch glass (2 inch & 3 inch)	20 each
82.	Glass slide plain	10 Pack
83.	Glass cover slip	10 Pack
84.	Petri dish (4 inch)	20
85.	Iodine flask (250 ml)	20
86.	Neubauer's chamber	20
87.	Air condenser (C2/11,C2/12)	20
88.	Glass tile	20
89.	Safety glasses	20
90.	Flat bottom flask (5 L)	10
91.	Rotational viscometer	10
92.	Micro pipette	20
93.	Wall thermometer	2
94.	Depression slide	20
95.	Colony counter	1
96.	Filtration assembly	5
97.	Distillation apparatus glass	5
98.	Glass vials	50
99.	Lens for microscope (10X & 40X)	5

Note. All the Glass apparatus will be of Class A grade