

**MINIMUM QUANTITATIVE STANDARD FOR A PHARMACY DEGREE PROGRAMME
PHARMACY BOARD OF MALAYSIA**

1. Ratio Between Lecturer and Student

The overall ratio between lecturer and student for a pharmacy programme is recommended to be at least 1:10 and for the clinical years it should be 1:8.

2. Percentage of Lecturers with Pharmacy Qualification

Course/Subject	Minimum Percentage of Lecturers with Basic Pharmacy Qualification	Minimum Number of Lecturers for Each Discipline	Minimum Number of Pharmacy Qualified Lecturers
Pharmaceutical Chemistry ☒ Pharmacognosy ☒ Pharmaceutical Analysis ☒ Basic Organic and Inorganic Chemistry ☒ Medicinal Chemistry	50%	4	2
Pharmaceutical Technology ☒ Quality Assurance ☒ Pharmaceutics ☒ Physical Pharmacy ☒ Pharmacokinetics ☒ Biotechnology	75%	4	3
Basic Health Sciences ☒ Physiology ☒ Biochemistry ☒ Immunology ☒ Microbiology ☒ Anatomy ☒ Biostatistics	25%	4	1
Pharmacology / Toxicology	50%	4	2
Clinical Pharmacy	80%	5 (1:8) Lecturer: student ratio is 1:8 for the clinical years	4
Pharmacy Practice	100%	3	3
Minimum total number of *full time lecturers in a pharmacy degree programme (4 years)		24	15

* Full Time Lecturers: Lecturers who are recruited by the Pharmacy Programme and come under the administration of the Pharmacy Programme.

For example, a pharmacy programme that has 60 students per intake (a total of 240 students) will need to have 24 fulltime lecturers ($240/10=24$) and at least 15 of them are pharmacy-qualified lecturers (having basic qualification in pharmacy). This satisfies the lecturer to student ratio of 1:10, for a 4-year pharmacy programme,

3. Students Entry Qualifications

Minimum entry qualifications for students are as follows;

- i. Passed STPM with CGPA 3 and above including Chemistry
- ii. Passed A Level with 3B including Chemistry
- iii. Matriculation CGPA 3 and above
- iv. Any Diploma in Science CGPA 3.8 and above
- v. Foundation in Science with 3B including Chemistry and CGPA 3 and above
- vi. First Degree in Science CGPA 2.5 and above

4. Qualification of Lecturers

Lecturers for the pharmacy programme should have at least a Masters degree (postgraduate) in an area relevant to the course that they are teaching. However, all institutions should aim to have all the academic staff with PhD qualifications. At the beginning of a programme, the school must have at least 2 academicians who are registered pharmacists in Malaysia with at least 3 years relevant working experience as a pharmacist (one of them may be the head). The school should have sufficient academic staff at the beginning of the programme for courses taught in the first year of the programme.

5. Laboratories and Other Facilities

Number of laboratory

Different laboratories should be available for:

- a. Pharmaceutics
- b. Chemistry
- c. Biological sciences: Pharmacology, Physiology, Histology, etc
- d. Pharmacy Practice

Most of the laboratory work can be conducted in groups **except for pharmacy practice, which must be conducted by the students individually.**

The suggested laboratory sizes per lab are as follows:

- a. The laboratory: **2.25 square meter per student**
- b. The general preparation space: **1.5 square meter per student**
- c. A separate room for laboratory staff (if possible, different from the preparation room).

6. ICT and Other Facilities

- a. All pharmacy students must have access to ICT facilities.
- b. Adequate number of tutorial rooms and lecture halls must be available.
- c. The library must have the books listed or alternatives that are current editions

7. Hospital Training

The hospital for clinical training should have at least, the following pharmacy services:

- i. Outpatient Pharmacy and Counseling Services
- ii. Ward Supply/Satellite Pharmacy
- iii. Aseptic Preparation (Total Parenteral Nutrition, Cytotoxic Drug Reconstitution, IV Admixture Services)
- iv. Drug Information
- v. Therapeutic Drug Monitoring

8. Syllabus

The definition of credit hours:

One credit hour is equal to one hour of lecture/tutorial per week for 14 weeks OR 3 hours of practical classes per week for 14 weeks. No credit transfer for core subjects is allowed.

Suggested number of minimum credit hours for each discipline:

SUBJECT	CREDIT HOUR
a. Pharmaceutical Technology	15
b. Pharmacy Practice	15
c. Pharmacology + Toxicology	15
d. Basic Health Sciences	20
e. Clinical Pharmacy	15
f. Pharmaceutical Chemistry	15
TOTAL CREDIT HOURS	95

Placement of students in hospitals, community pharmacies and pharmaceutical factories must be included in the programme and each placement must not be less than 2 weeks in duration.

9. Equipments

Proposed list of equipments for 40 pharmacy students:

	EQUIPMENT	Min. Qty (unit)
1.	Ampoule sealer	1
2.	Analytical Balance, 4 Decimal Places	5
3.	Animal Balance	1
4.	Autoclave	2
5.	Bacteria collector	1
6.	Balance (Top pan or analytical), 2-3 decimal places, up to 1kg	10
7.	Bench Top Oven	4
8.	Burette Stand	40
9.	Cap sealer, for I.V. Bottles, Crimpton Sealer	2
10.	Centrifuge, up to 6,000 RPM, Bench Top & Accessories	2
11.	Colony Counter	1
12.	Computers with printers	10
13.	Conductivity Meter	1
14.	Coulter Counter or other suitable equipment for particle size determination	1
15.	Dessicator, glass	10
16.	Disintegration Apparatus, BP/USP Specification	1
17.	Dissolution Apparatus, BP/USP Specification (1 vessel per 4 students)	2
18.	Electrophoresis apparatus	2
19.	Electrophoresis slab-gel	1
20.	Filtration Unit, Vacuum Filter and Pump	10
21.	Flame Photometer equivalent	1
22.	Fluidised Bed Dryer	1
23.	Fourier Transform-Infrared Spectrophotometer & Accessories e.g. Press, Disc for KBr, Vacuum Pump, Cells, Reflectance Unit, etc	1
24.	Freezer (-20°C)	1
25.	Friability Apparatus	1
26.	Fume Cupboards	1 per lab
27.	Gas Liquid Chromatography	1
28.	Glucose analyzer	5
29.	Granulator	1
30.	Grinder	1
31.	Haemocytometer	10
32.	Hardness Tester (tablets) Pfizer or Monsanto	1
33.	Heating Mantle, Electrothermal	20

34.	High Performance Liquid Performance Chromatography System, UV/VIS Detector, Software, Accessories	1
35.	Hot Plate	20
36.	Ice Maker	1
37.	Inoculating Wires	40
38.	Kymograph & Polygraphs (Maclabs-Data acquisition system) & accessories	5
39.	Laminar Flow Cabinet, for Sterile Products	2
40.	Liquid Allen Viewer	2
41.	Magnetic Stirrer	20
42.	Melting Point Apparatus	8
43.	Microscope	20
44.	Mixer (chef type)	1
45.	Mortar and pestle (glass)	40
46.	Mortar and pestle (porcelain)	40
47.	Organ bath	5
48.	Peak Flow Meters	10
49.	Peristaltic pump	2
50.	pH Meter & Glass Electrode	5
51.	Polarimeter with Built-in Light Source	1
52.	Recording Spectrophotometer, UV/VIS, double beam, Scanning, Plotter	1
53.	Refractometer, Bench Mounted e.g. Bellingham & Stanley	1
54.	Refrigerator	2
55.	Rheometer	1
56.	Safety Spectacles	40
57.	Shaker and set of Sieves	1
58.	Silverson Mixer or equivalent	1
59.	Solvent Cabinet	2
60.	Spectrofluorometer	1
61.	Spectrophotometer, UV/VIS, Single Beam	4
62.	Sphygmomanometer & Stethoscope	10 sets
63.	Stand & Clamps, Stainless Steel	40
64.	Standard Graticule & Micrometer for Size Analysis	1
65.	Suppository Moulds	40 sets
66.	Tableting machine	1
67.	Timer/ Stop clock	20
68.	TLC Plate	20
69.	TLC Tank	20
70.	Ultrasonic cleaner	1
71.	Ultrasonicator	1
72.	UV Viewing Cabinet (Allen viewer)	1

73.	Vacuum Evaporator & Circulating Vacuum Pump e.g. Buchii	2
74.	Vernier Calipers	5
75.	Vial Sealer	2
76.	Video Player and Monitor	1
77.	Viscometer (Falling ball with ball bearings)	1
78.	Viscometer (U-tubes)	5 sets
79.	Water Bath (individual)	40
80.	Water Bath, electric with temperature control (6 vessels each)	4 sets
81.	Water Purification System (Distillation Deionisation) & Storage Container	1

Suggestions for glassware and other laboratory equipment

Sufficient quantities of glassware and other laboratory equipment should be provided so that students will be able to work independently without sharing glassware;

Aluminium Bowl
 Amber Coloured glass bottle: 50ml, 100ml, 200ml
 Ampoules: 2ml, 5ml, 10ml
 Beaker: 25ml, 50ml, 100ml, 250ml, 500ml
 Bijou Bottles
 Bunsen Burner
 Burette: 50ml
 Conical Flask with Stopper
 Conical Flasks: 100/125ml, 250ml
 Dewar Flask
 Disposable Syringe: 10ml, 5ml
 Evaporating Basin, Porcelain: 100ml, 200ml
 Eye drops Bottles, glass: 30ml
 Filter Flask
 Funnel Glass: 5cm, 10cm
 Glass Bottle with Screw Cap: 100ml
 Glass Bottle with Screw Cap: 200ml
 Graduated Pipette Class B: 1ml, 2ml, 5ml, 10ml
 Intravenous Bottles: 500ml
 Measuring Cylinder, Conical: 10ml, 50ml, 100ml, 250ml, 500ml, 1000ml
 Membrane Filter: 0.22um
 Membrane Filter: 0.45um
 Ointment Slab or White tile 20cm x 30cm
 Pasteur Pipette: 150mm
 Pipette Bulb 10ml
 Pipette Bulb 25ml
 Pipette-Pump, Green 10ml, Red 25ml
 Retort Stand, Boss-head, Tri- clamp, O ring
 Round Bottom Flask 2 Neck: 250ml
 Round Bottom Flask: 250ml
 Separating Funnel
 Slides and Cover Slips

Spatula Stainless Steel: 210mm, 150mm
Spatula Stainless Steel: Mixing
Spatula, Bakelite
Spatula, Chattaway
Spatula, Stainless Steel, Broad Blade
Stirring Glass Rod 30cm
Test Tube Holder
Test Tube Rack
Test Tubes
Thermometer 250c
Tripod Stand & Wire Gauze
Vials: 30ml
Volumetric Flask: 50ml, 100ml, 250ml
Wash Bottles 250ml
Watch Glass 80mm
Weighing Boat Scoop

10. List of References:

Proposed list of references for pharmacy students:

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