

REGULATIONS 2016

## SYLLABUS

for Courses affiliated to the  
**KERALA UNIVERSITY OF HEALTH SCIENCES**

Thrissur 680596



**BACHELOR OF PHARMACY (B. Pharm)**  
**( 2016-17 Academic year onwards)**

**Course Code:009**

**2016**



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**Principal**  
Pushpagiri College of Pharmacy  
Medicity Campus, Tiruvalla  
Kerala - 689 107, Kerala

## 2. COURSE CONTENT

### 2.1. Title of course:

Bachelor of Pharmacy –B. Pharm

### 2.2. Objectives of course

The objectives of the course is to mould the student to suit the varied requirements of

- Pharmaceutical industry – Research & Development, Manufacturing, Formulation, Quality Control, Quality assurance, Packaging, Marketing.
- Practice settings in – Hospital Pharmacy, Clinical Pharmacy and Community Pharmacy.
- Academics.
- Regulatory affairs.
- Clinical Research.
- Drug discovery and development

### 2.3. Medium of instruction:

Medium of instruction and examinations shall be English

### 2.4. Course outline

The B.Pharm course is of four years duration, with University examinations at the end of each year and includes one month internship/practical training and industrial visit.

Those admitted directly to the second year, the course of study for B. Pharm course shall be for a minimum period of three academic years with University examinations at the end of each year and includes one month internship/practical training and industrial visit.



## 2.5. Duration

The course of study for B. Pharm shall be for a period of four academic year, with University examinations at the end of each year and includes one month internship/practical training and industrial visit. Direct admission of Diploma in Pharmacy holders to the second year B. Pharm course is subjected to the ceiling of approved strength of the first year course by the Pharmacy Council of India and All India Council for Technical Education. For those admitted directly to the second year, the course of study for B. Pharm course shall be for a minimum period of three academic years with University examinations at the end of each year and includes one month internship/practical training and industrial visit.

Each academic year consists of minimum 240 working days.

The working day can include hours for conducting seminars, synopsis, group discussions or such academic activities as decided by the principals/HOD s

## 2.6. Syllabus

### First B Pharm

Subject code	Subject	Hours of theory per week	Hours of practical per week
1-1	Pharmaceutical chemistry I ( Inorganic and Physical chemistry )	3	3
1-2	Pharmaceutical chemistry II ( Organic chemistry )	3	3
1-3	Pharmaceutics I (Dispensing and General pharmacy )	2	6
1-4	Human Anatomy & Physiology	3	3



1-5	Pharmacognosy-I	3	3
	Tutorials	3	
	Total number of hours /week	17	18

Second B Pharm

Subject code	Subject	Hours of theory per week	Hours of practical per week
2- 1	Pharmaceutical chemistry –III (Advanced organic chemistry)	3	3
2- 2	Pharmaceutical Analysis -I	2	6
2- 3	Pharmaceutics –II (Physical Pharmacy)	2	3
2- 4	Pathophysiology & Health Education	2	-
2- 5	Mathematics, Biostatistics & Computer applications	4	-
2- 6	Pharmaceutical Technology ( Pharmaceutics III )	2	3
2- 7	Applied Biochemistry & Molecular Biology	3	3
	Total number of hours /week	18	18

Third B Pharm



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Subject code	Subject code	Hours of theory per week	Hours of practical per week
3-1	Pharmaceutics IV ( Pharmaceutical Microbiology & Biotechnology)	2	3
3-2	Pharmaceutical Chemistry IV (Chemistry of Natural Products)	3	3
3-3	Pharmacology – I	3	3
3-4	Pharmaceutics- V (Bio pharmaceutics & Pharmacokinetics)	2	3
3-5	Pharmaceutical Jurisprudence	2	-
3-6	Pharmacognosy -II	3	3
3-7	Pharmaceutical Management	2	-
	Tutorials	3	-
	Total number of hours /week	20	15

#### Fourth B Pharm

Subject code	Subject	Hours of theory per week	Hours of practical per week
4-1	Pharmaceutical chemistry –V ( Medicinal Chemistry )	3	3
4-2	Pharmaceutical analysis -II	2	3
4-3	Pharmacognosy-III	2	3

4-4	Pharmaceutics VI ( Formulative & Industrial pharmacy)	3	6
4-5	Pharmacology –II -	3	3
4-6	Pharmacy Practice	2	2
4-7	Project work	1	
	Total numbers of hours /week	16	20

## 2.7. Total number of hours

First B Pharm-

Total number of hours/week      17/ week(theory)      18/ week(Practical)

Second BPharm

Total number of hours/week      18/ week(theory)      18/ week(Practical)

Third BPharm

Total number of hours/week      20/ week(theory)      15/ week(Practical)

Fourth BPharm

Total number of hours/week      16/ week(theory)      20/ week(Practical)

The concept of health care counseling shall be incorporated in all relevant areas.

## 2.8. Branches if any with definition

Not applicable

## 2.9. Teaching learning methods

- Lecture and practical classes
- INDUSTRIAL VISIT



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13. Clinical management (including clinical manifestations, clinical investigations/ assessment, treatment algorithms, management of adverse effects of therapy, and patient education) of the following organ disorders: ( 9 hours )

- a) Cardiovascular disorders : Hypertension, Congestive heart failure, Angina, Acute Myocardial infraction , Cardiac arrhythmias
- b) Central nervous disorders : Epilepsy, Parkinsonism, Schizophrenia, Depression
- c) Respiratory disorders : Asthma , COPD
- d) Gastro intestinal disorders : Peptic ulcer, Ulcerative colitis, Hepatitis, Cirrhosis
- e) Endocrine disorders : Diabetes mellitus, Thyroid disorders
- f) Infectious disorders : Tuberculosis, Urinary tract infections, Enteric infection, Upper respiratory tract infection & HIV
- g) Hemopoietic disorders : Anaemias,
- h) Joint & connective disorders : Rheumatic diseases, Osteoporosis
- i) Neoplastic disorders : Acute leukaemias, Hodgkins disease& carcinoma of breast

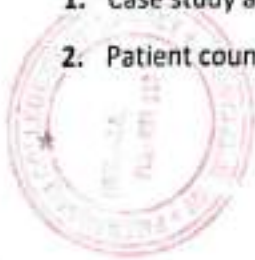
### C:COMMUNITY PHARMACY

1.Community Pharmaceutical Services, Organization structure of retail & whole sale – location, legal requirements for establishments. Maintenance of records. Community Pharmacy management, finance, personnel, materials.( 3 hours )

2.Communication skills: (1 hour) model of communication, verbal and non-verbal communication, questioning skills, explaining skills, listening skills & counseling skills.

### PRACTICALS (2 hrs/week)

1. Case study analysis (Hypertension, CHF, AMI, Asthma, Epilepsy, DM, PUD, RA).
2. Patient counseling (Hypertension, CHF, AMI, Asthma, Epilepsy, DM, PUD, RA)



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3. Identification and correction of incompatibilities in prescriptions
4. Analysis of prescriptions of drug interactions, over dosage
5. Preparation of drug profiles, packaging inserts, leaflets etc.
6. Drug information queries & Answering for health professionals and patients - on diseases and therapy mentioned in the theory
7. Dosage adjustment in geriatrics, pediatrics, hepatic failure, renal failure & heart failure cases.
8. Familiarity with Hospital equipments and surgical accessories
9. Drug store management & Inventory control (ABC Aalysis).
10. Evaluation of surgical dressings & surgical instruments, glass wares and other hospital supplies.

#### BOOKS RECOMMENDED

1. Text book of Clinical Pharmacy by Tipnis
2. Text Book of Clinical Pharmacy by Lassar.
3. Roger Walker & Clive Edwards: Clinical Pharmacy & Therapeutics by Clive Edwards.
4. Text Book of Pharmacotherapeutics by Joseph T Dipiro.
5. Text book of Pharmacotherapeutics by Herfindal.
6. Text book of Biopharmaceutics and Clinical Pharmacokinetics By Brahmankar.
7. Remington: The Sciences and Practices of Pharmacy
8. Text Book of Hospital Pharmacy by William E Hassan. Lea & Febiger, Philadelphia.
9. Text book of Hospital Pharmacy by S.H.Merchant & Dr. J S Quadry.

#### PROJECT WORK (B Pharm)

A project work based on literature survey on a current topic of relevance, consisting of about 30 pages (Times New Roman, Font size 14, line space 1.5), spirally bound should be submitted to the Principal/Head of the Department. The candidate should present the work with the help of



audiovisual aids, which will be evaluated by a team of senior faculty members of the college. The criteria for evaluation:

- Relevance of the topic : 5 marks
- Content : 25 marks
- Scripting and editing : 20 marks
- Presentation and slides: 40 marks
- Discussion and defence: 10 marks

#### 4.2. List of journals recommended

Indian Journal of Pharmaceutical Sciences  
Medicinal and Aromatic Plants Abstracts  
Indian Journal of Pharmacology  
Indian Journal of Chemistry  
Indian Journal of Pharmaceutical Education and Research  
Phytopharm  
Pharma Times  
Indian Pharmacist  
Indian Journal of Hospital Pharmacy  
Pharmacognosy Magazine  
Indian Drugs  
Pharma Biz  
MIMS India  
Fitoterapea  
International Journal of Pharmaceutics  
Journal of Pharmacy Practice and Research  
International Journal of Pharma Research and Review  
Drug Designing : Open access



Journal of Applied Pharmacy Research and Reviews ; Journal of Pharmacognosy & Phytochemistry  
International Journal of Pharmacy and Biological Sciences  
Journal of Pharmaceutical Sciences  
Planta Medica  
Journal of Pharmacy and Pharmacology  
Drug discovery Today : Therapeutic Strategies  
Journal of Ethnopharmacology  
Drug development & Industrial Pharmacy  
Drugs  
Journal of Organic Chemistry  
Journal of Pharmaceutical and Biomedical Analysis  
Journal of Pharmaceutical Sciences  
Journal of Pharmacology and Exp. Therapeutics  
Journal of Pharmacy and Pharmacology  
Manufacturing Chemist  
Pharmacological Reviews  
Pharmacy Education  
Phytochemistry  
Medicinal chemistry  
Organic chemistry: current research  
Pharmaceutical Analytical Chemistry  
International Journal of Pharmaceutical Chemistry  
International Journal of Research in Pharmacy and Chemistry

**2.11. No: of hours per subject**

As given in 2.10

**2.12. Practical training**

Not applicable

- 2.13. **Records**  
To be maintained as per requirement.
- 2.14. **Dissertation:**  
Not applicable
- 2.15. **Speciality training if any**  
As given in curriculum
- 2.16. **Project work to be done if any**  
As given in curriculum
- 2.17. **Any other requirements [CME, Paper Publishing etc.]**  
As decided by HOD of the institution
- 2.18. **Prescribed/recommended textbooks for each subject**  
As given in curriculum
- 2.19. **Reference books**  
As given in curriculum
- 2.20. **Journals**  
As given in curriculum
- 2.21. **Logbook**

### 3 EXAMINATIONS

#### 3.1 Eligibility to appear for exams

- A candidate is eligible for registering for the examinations only if he/she secures a minimum of 50% marks in internal assessment in theory and practical separately.
- Partial appearance for the examinations : A candidate is allowed partial appearance for the University examinations, including practical examinations, provided he/ she has 80% attendance in all subjects, in theory and practical separately.
- Eligibility for appearance for supplementary examinations: A candidate can register for supplementary examinations if he/she has 80 % attendance in theory and practical

separately for that subject/s and has minimum 35% Internal Assessment marks in theory and practical separately in that subject/s.

### 3.2 Schedule of Regular/Supplementary exams

There will be one main examinations and one supplementary examination six months apart.

### 3.3 Scheme of examination showing maximum marks and minimum marks

The scheme of examinations is as per the regulations of the respective Board of Studies and statutory council.

#### First year:

The first year will ordinarily start in and October/ November, the first year examination shall be at the end of one academic year of first year

The first year examination shall be held in the following subjects:

S L N o	Subject		Theory			Practical			Total		Res ult
	Paper		Max	Min	Awarde d	Max	Min	Awarde d	Max	Min	
1	Pharmaceutic al Chemistry I (Inorganic	IA	50	25		50	25		300	150	
		Universit y	100	50		80	40.00				



	and Physical Chemistry)	Viva	-	-		20	-				
2	Pharmaceutical Chemistry II (Organic Chemistry)	IA	50	25		50	25		300	150	
		University	100	50		80	40.00				
		Viva	-	-		20	-				
3	Pharmaceuticals I (Dispensing and General Pharmacy)	IA	50	25		50	25		300	150	
		University	100	50		80	40.00				
		Viva	-	-		20	-				
4	Human Anatomy & Physiology	IA	50	25		50	25		300	150	
		University	100	50		80	40.00				
		Viva	-	-		20	-				
5	Pharmacognosy I	IA	50	25		50	25		300	150	
		University	100	50		80	40.00				
		Viva	-	-		20	-				
Grand Total									1500	750	



  
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**Second year:**

The second year examination shall be held in the following subjects (2012 admission onwards):

Sl. No	Subject		Theory			Practical			Total			Result
	Paper		Max	Min	Awarded	Max	Min	Awarded	Max	Min	Awarded	
1	Pharmaceutical Chemistry III (Advanced Organic Chemistry)	IA	50	25		50	25		300	150		
		University	100	50		80	40.00					
		Viva	-	-		20	-					
2	Pharmaceutical Analysis-I	IA	50	25		50	25		300	150		
		University	100	50		80	40.00					
		Viva	-	-		20	-					
3	Pharmaceuticals II	IA	50	25		50	25		300	150		
		University	100	50		80	40.00					



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		Viva	-	-		20	-						
4	Pathophysiology, Health Education, & Community Pharmacy	IA	50	25		-	-		150	75			
		University	100	50		-	-						
		Viva	-	-		-	-						
5	Mathematics, Biostatistics & Computer Application	IA	50	25		-	-		150	75			
		University	100	50		-	-						
		Viva	-	-		-	-						
6	Pharmaceutics -III (Pharmaceutical Technology)	IA	50	25		50	25		300	150			
		University	100	50		80	40.00						
		Viva	-	-		20	-						
7	Applied Biochemistry & Molecular Biology	IA	50	25		50	25		300	150			
		University	100	50		80	40.00						
			-	-		20	-						
Grand Total										1800	900		

Result



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**Third year:**

The third year examination shall be held in the following subjects (2012 admission onwards):

S L N o	Subject		Theory			Practical			Total			Res ult
	Paper		Max	Min	Awa rded	Max	Min	Awa rded	Max	Min	Awar ded	
1	Pharmaceutics- IV (Pharmaceutical Microbiology and Biotechnology)	IA	50	25		50	25		300	150		
		Unive rsity	100	50		80	40.00					
		Viva	-	-		20	-					
2	Pharmaceutical Chemistry IV (Chemistry of Natural Products)	IA	50	25		50	25		300	150		
		Unive rsity	100	50		80	40.00					
		Viva	-	-		20	-					
3	Pharmacology I	IA	50	25		50	25		300	150		
		Unive rsity	100	50		80	40.00					



		Viva	-	-		20	-					
4	Pharmaceutics -V (Biopharmaceutics & Pharmacokinetics)	IA	50	25		50	25		300	150		
		University	100	50		80	40.00					
		Viva	-	-		20	-					
5	Pharmaceutical Jurisprudence	IA	50	25		-	-		150	75		
		University	100	50		-	-					
		Viva	-	-		-	-					
6	Pharmacognosy II	IA	50	25		50	25		300	150		
		University	100	50		80	40.00					
		Viva	-	-		20	-					
7	Pharmaceutical Management	IA	50	25		-	-		150	75		
		University	100	50		-	-					
			-	-		-	-					
Grand Total									1800	900		

Fourth year:

The fourth year examination shall be held in the following subjects (2012 admission onwards):

S I. N o	Subject		Theory			Practical			Total			Res ult
	Paper		Max	Min	Awar ded	Max	Min	Awa rded	Max	Min	Awa rded	
1	Pharmaceutic al Chemistry V (Medicinal Chemistry)	IA	50	25		50	25		300	150		
		Univer sity	100	50		80	40.00					
		Viva	-	-		20	-					
2	Pharmaceutic al Analysis II	IA	50	25		50	25		300	150		
		Univer sity	100	50		80	40.00					
		Viva	-	-		20	-					
3	Pharmacogno sy III	IA	50	25		50	25		300	150		
		Univer sity	100	50		80	40.00					
		Viva	-	-		20	-					
4		IA	50	25		50	25		300	150		



	Pharmaceutics VI (Formulative & Industrial Pharmacy)	University	100	50		80	40.00					
		Viva	-	-		20	-					
5	Pharmacology II	IA	50	25		50	25					
		University	100	50		80	40.00		300	150		
		Viva	-	-		20	-					
6	Pharmacy Practice (Hospital Pharmacy and Clinical Pharmacy)	IA	50	25		50	25					
		University	100	50		80	40.00		300	150		
		Viva	-	-		20	-					
7	Project Work	IA	100	35		-	-		100	50		
Grand Total									1900	950		



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### 3.4 Papers in each year

#### I Year B.Pharm

Sl. No.	Subjects	Lecture (hrs)	Practical (hrs)	Total (hrs)
1	Pharmaceutical chemistry I ( Inorganic and Physical chemistry )	50	75	125
2	Pharmaceutical chemistry II ( Organic chemistry )	75	75	150
3	Pharmaceutics I (Dispensing and General pharmacy)	50	150	200
4	Human Anatomy & Physiology	75	75	150
5	Pharmacognosy-I	75	75	150
	Tutorials	100		100
	Total number of hours	425	450	875

#### II Year B.Pharm

Sl No.	Subjects	Lecture (hrs)	Practical (hrs)	Total (hrs)
1	Pharmaceutical chemistry -III (Advanced organic chemistry)	75	75	150
2	Pharmaceutical Analysis -I	50	150	200
3	Pharmaceutics -II (Physical Pharmacy)	50	75	125
4	Pathophysiology , Health Education & Community Pharmacy	50	-	50

5	Mathematics, Biostatistics & Computer applications	100	-	100
6	Pharmaceutics- III (Pharmaceutical Technology)	50	75	125
7	Applied Biochemistry & Molecular Biology	75	75	150
	<b>Total</b>	<b>450</b>	<b>450</b>	<b>900</b>

### III Year B.Pharm

Sl No.	Subjects	Lecture (hrs)	Practical (hrs)	Total (hrs)
1	Pharmaceutics -IV (Pharmaceutical Microbiology & Biotechnology)	50	75	125
2	Pharmaceutical Chemistry IV (Chemistry of Natural Products)	75	75	150
3	Pharmacology – I	75	75	150
4	Pharmaceutics- V (Biopharmaceutics & Pharmacokinetics)	50	75	125
5	Pharmaceutical Jurisprudence	50	-	50
6	Pharmacognosy -II	50	75	125
7	Pharmaceutical Management	50	-	50
	Tutorials	100	-	100
	<b>Total</b>	<b>500</b>	<b>375</b>	<b>875</b>



#### IV Year B.Pharm

Sl No.	Subjects	Lecture (hrs)	Practical (hrs)	Total (hrs)
1	Pharmaceutical chemistry -V ( Medicinal Chemistry )	75	75	150
2	Pharmaceutical Analysis -II	50	75	125
3	Pharmacognosy -III	50	75	125
4	Pharmaceutics VI ( Formulative & Industrial pharmacy)	75	150	225
5	Pharmacology -II	75	75	150
6	Pharmacy Practice (Hospital Pharmacy & Clinical Pharmacy)	50	50	100
7	Project work	75	-	75
	<b>Total</b>	<b>400</b>	<b>500</b>	<b>900</b>

#### 3.5 Details of theory exams

##### BPharm Theory Examination Question Paper Pattern

##### Theory Examinations:

14 questions of 5 marks each = 70 marks  
3 questions of 10 marks each = 30 marks

**Total** = 100 marks

58



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**Practical examinations:**

- Synopsis - 20 marks
- Major experiment/s - 35 marks
- Minor experiment/s - 25 marks
- Viva-voce - 20 marks

**Total - 100marks**

NAME OF EXAMINATION: First Year BPharm Degree Examinations (2012 admission) September 2013

Sl. No	Subject	Sub Code	Theory				Practice				Total						
			Internal		University		Internal		University		Viva	Practical Group					
			Max	Min	Max	Min	Max	Min	Max	Min		Max	Min				
1	Pharmacology I	Sub1	50	17.50	100	50.00	150	75	50	17.50	80	40.00	20	150	75	300	150
2	Pharmaceutical Chemistry I	Sub2	50	17.50	100	50.00	150	75	50	17.50	80	40.00	20	150	75	300	150
3	Pharmaceutical Chemistry II	Sub3	50	17.50	100	50.00	150	75	50	17.50	80	40.00	20	150	75	300	150
4	Pharmaceutics I	Sub4	50	17.50	100	50.00	150	75	50	17.50	80	40.00	20	150	75	300	150
5	Human Anatomy and Physiology	Sub5	50	17.50	100	50.00	150	75	50	17.50	80	40.00	20	150	75	300	150
<b>GRAND TOTAL</b>															1500	750	



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NAME OF EXAMINATION

S. No	Subject	Sub Code	Theory		Theory Group		Practical			Practical Group		Total					
			Internal	University	Max.	Min.	Internal	University	Viva	Max.	Min.	Max.	Min.				
			Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.			
1	Pharmaceutical Chemistry II (Advanced Topics)	Sub1	50	17.50	100	50.00	150	75	50	17.50	80	40.00	20	150	75	300	150
2	Pharmaceutical Analysis	Sub2	50	17.50	100	50.00	150	75	50	17.50	80	40.00	20	150	75	300	150
3	Pharmacokinetics	Sub3	50	17.50	100	50.00	150	75	50	17.50	80	40.00	20	150	75	300	150
4	Pharmaceutical Marketing & Health Education	Sub4	50	17.50	100	50.00	150	75	-	-	-	-	-	-	-	150	75
5	Mathematics, Biostatistics & Computer Applications	Sub5	100	50.00	-	-	150	75	-	-	-	-	-	-	-	150	75
6	Pharmaceutical Technology	Sub6	50	17.50	100	50.00	150	75	50	17.50	80	40.00	20	150	75	300	150
7	Regulatory Toxicology & Medical Ethics	Sub7	50	17.50	100	50.00	150	75	50	17.50	80	40.00	20	150	75	300	150
<b>GRAND TOTAL</b>													<b>1800</b>	<b>900</b>			



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## SYLLABUS

for Courses affiliated to the

**Kerala University of Health Sciences**

Thrissur 680596



**DOCTOR OF PHARMACY (PHARM D)**

**Course Code: 282**

**(2016-17 Academic year onwards)**

**2016**



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P.O. Puthuppalai, Thrissur  
Kerala

## 2. COURSE CONTENT

### 2.1. Title of course:

Doctor of Pharmacy (Pharm D)

### 2.2. Objectives of course

The Doctor of Pharmacy education will aim at producing post graduates, having profound knowledge of pharmacy supplemented with knowledge of scientific advances in Modern medicine along with extensive practical training; who will become efficient Physicians fully competent to serve the health care professional.

The aim of the course is to mould the student to suit the varied requirements of

- i. Practice settings in – Hospital Pharmacy and Community Pharmacy.
- ii. Clinical Pharmacy services
  - a. Patient counseling
  - b. Drug information
  - c. Therapeutic Drug Monitoring(TDM) and Dose calculation
- iii. Academics.
- iv. Regulatory affairs.

### 2.3. Medium of instruction:

The medium of instruction for the course shall be English.

### 2.4. Course outline

The course of study for Pharm.D shall include the subjects as given in the Tables below. The number of hours in a week, devoted to each subject to its teaching in theory, practical and tutorial shall not be less than that noted against it in columns (3), (4) and (5) below



**First Year**

S.No	Name of Subject	No. of hours of Theory	No. of hours of Practical	No. of hours of Tutorial
(1)	(2)	(3)	(4)	(5)
1.1	Human Anatomy and Physiology	3	3	1
1.2	Pharmaceutics	2	3	1
1.3	Medicinal Biochemistry	3	3	1
1.4	Pharmaceutical Organic Chemistry	3	3	1
1.5	Pharmaceutical Inorganic Chemistry	2	3	1
1.6	Remedial Mathematics/ Biology	3	3*	1
	<b>Total hours</b>	<b>16</b>	<b>18</b>	<b>6=(40)</b>

\* Only for Biology

**Second Year**

S.No	Name of Subject	No. of hours of Theory	No. of hours of Practical	No. of hours of Tutorial
(1)	(2)	(3)	(4)	(5)
2.1	Pathophysiology	3	-	1
2.2	Pharmaceutical Microbiology	3	3	1
2.3	Pharmacognosy & Phytopharmaceuticals	3	3	1
2.4	Pharmacology-I	3	-	1
2.5	Community Pharmacy	2	-	1
2.6	Pharmacotherapeutics-I	3	3	1
	<b>Total hours</b>	<b>17</b>	<b>9</b>	<b>6=(32)</b>

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**Third Year**

S.No	Name of Subject	No. of hours of Theory	No. of hours of Practical	No. of hours of Tutorial
(1)	(2)	(3)	(4)	(5)
3.1	Pharmacology-II	3	3	1
3.2	Pharmaceutical Analysis	3	3	1
3.3	Pharmacotherapeutics-II	3	3	1
3.4	Pharmaceutical Jurisprudence	2	-	-
3.5	Medicinal Chemistry	3	3	1
3.6	Pharmaceutical Formulations	2	3	1
Total hours		16	15	6=(36)

**Fourth Year**

S.No	Name of Subject	No. of hours of Theory	No. of hours of Practical	No. of hours of Tutorial
(1)	(2)	(3)	(4)	(5)
4.1	Pharmacotherapeutics-III	3	3	1
4.2	Hospital Pharmacy	2	3	1
4.3	Clinical Pharmacy	3	3	1
4.4	Biostatistics & Research Methodology	2	-	1
4.5	Biopharmaceutics & Pharmacokinetics	3	3	1
4.6	Clinical Toxicology	2	-	1
Total hours		15	12	6=(33)



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### Fifth Year

S.No	Name of Subject	No. of hours of Theory	No. of hours of Practical	No. of hours of Tutorial
(1)	(2)	(3)	(4)	(5)
5.1	Clinical Research	3	-	1
5.2	Pharmacoepidemiology and Pharmacoeconomics	3	-	1
5.3	Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring	2	-	1
5.4	Clerkship *	-	-	1
5.5	Project work (Six Months)	-	20	-
	Total hours	8	20	4=(32)

\*Attending ward rounds on a daily basis.

### Sixth Year:

Internship or residency training, including postings in specialty units. The student should independently provide the clinical pharmacy services to the allotted wards.

- Six months in General Medicine department, and
- Two months each in three other speciality departments.

#### 2.5. Duration

The duration of the course shall be six academic years (five years of study and one year of internship or residency) full time with each academic year spread over a period of not less than 200 working days. The period of six years duration is divided into two phases –

Phase I – consisting of first, Second, Third, fourth and the fifth academic year.

Phase II – consisting of internship or residency training during the sixth year involving posting in specialty units.

It is a phase of training wherein a student is exposed to actual pharmacy practice or clinical pharmacy services and acquires skill under supervision so that he or she may become capable of functioning independently.

#### 2.6. Syllabus

As mentioned in "Content of each subject in each year" (clause 2.10)

The concept of health care counselling shall be incorporated in all relevant areas.



- 2.7. **Total number of hours**  
As mentioned in "Content of each subject in each year" (clause 2.10)
- 2.8. **Branches if any, with definition**  
As mentioned in "Content of each subject in each year" (clause 2.10)
- 2.9. **Teaching, learning methods**  
Classroom lectures using Blackboard and PowerPoint presentations.  
Teaching with Counselling heads, Case presentations, Seminar, Clerkships and projects and any other methods decided by the respective H.O.D's
- 2.10 **Content of each subject in each year**

**FIRST YEAR**

**1.1 HUMAN ANATOMY & PHYSIOLOGY (THEORY)**

**Theory: 3 Hrs. /Week**

- 1 **Scope and Objectives:** This course is designed to impart a fundamental knowledge on the structure and functions of the human body. It also helps in understanding both homeostasis mechanisms and homeostatic imbalances of various body systems. Since a medicament, which is produced by a pharmacist, is used to correct the deviations in the human body, it enhances the understanding of how the drugs act on the various body systems in correcting the disease state of the organs.
2. **Upon completion of the course the student shall be able to:**
- Describe the structure (gross and histology) and functions of various organs of the human body;
  - Describe the various homeostatic mechanisms and their imbalances of various systems;
  - Identify the various tissues and organs of the different systems of the human body;
  - Perform the hematological tests and also record blood pressure, heart rate, pulse and Respiratory volumes;
  - Appreciate coordinated working pattern of different organs of each system;
  - Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body



**3.7 Internal assessment component**

As given in Scheme of examination showing maximum marks and minimum marks (clause 3.3)

**3.8 Details of practical/clinical practical exams**

As given in content of each subject in each year (clause 2.10)

**3.9 Number of examiners needed (Internal & External) and their qualifications**

Examiner – From within this University or other Universities with 5 years Post PG teaching experience.

There shall be two examiners for practical examination-one internal and one external, who will jointly evaluate the performance of the candidate and conduct viva voce examination and award marks.

**3.10 Details of viva:**

• **Scheme of Practical Examination:**

	Sessionals	Annual
Identification	04	10
Synopsis	04	10
Major Experiment	07	20
Minor Experiment	03	15
Viva	02	15
<b>Max Marks</b>	<b>20</b>	<b>70</b>
<b>Duration</b>	<b>03hrs</b>	<b>04hrs</b>

Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

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## 4. INTERNSHIP

### 4.1 Eligibility for internship

The student will join the compulsory rotatory internship programme after passing the final professional examination.

Every candidate shall be required, after passing the final Pharm.D examination as the case may be to undergo compulsory rotational internship to the satisfaction of the College authorities and University concerned for a period of twelve months so as to be eligible for the award of the degree of Pharm.D as the case may be.

### 4.2 Details of internship, Duration

Internship or residency training including postings in speciality units. Student should independently provide the clinical pharmacy services to the allotted wards.

- (i) Six months in General Medicine department,
- (ii) Two months each in three other speciality departments

#### SPECIFIC OBJECTIVES :

- (i) To provide patient care in cooperation with patients, prescribers, and other members of an inter professional health care team based upon sound therapeutic principles and evidence-based data, taking into account relevant legal, ethical, social cultural, economic, and professional issues, emerging technologies, and evolving biomedical, pharmaceutical, social or behavioral or administrative, and clinical sciences that may impact therapeutic outcomes.
- (ii) to manage and use resources of the health care system, in cooperation with patients, prescribers, other health care providers, and administrative and supportive personnel, to promote health; to provide, assess, and coordinate safe, accurate, and time-sensitive medication distribution; and to improve therapeutic outcomes of medication use.
- (iii) to promote health improvement, wellness, and disease prevention in cooperation with patients, communities, at-risk population, and other members of an interprofessional team of health care providers.
- (iv) to demonstrate skills in monitoring of the National Health Programmes and schemes, oriented to provide preventive and promotive health care services to the community.





- (v) To develop leadership qualities to function effectively as a member of the health care team organised to deliver the health and family welfare services in existing socio economic, political and cultural environment.

- (vi) To communicate effectively with patients and the community.

The intern shall maintain a record of work which is to be verified and certified by the preceptor (teacher practitioner) under whom he/she works. Apart from scrutiny of the record of work, assessment and evaluation of training shall be undertaken by an objective approach using situation tests in knowledge, skills and attitude during and at the end of the training. Based on the record of work and date of evaluation, the Dean or Principal shall issue certificate of satisfactory completion of training, following which the university shall award the degree or declare him eligible for it.

#### 4.3 Model of Internship Mark lists

Satisfactory completion of internship shall be determined on the basis of the following:-

- 1) Proficiency of knowledge required for each case management. SCORE 0-5
- 2) The competency in skills expected for providing Clinical Pharmacy Services SCORE 0-5
- 3) Responsibility, punctuality, work up of case, involvement in patient care SCORE 0-5
- 4) Ability to work in a team (Behavior with other healthcare professionals including medical doctors, nursing staff and colleagues SCORE 0-5
- 5) Initiative, participation in discussions, research aptitude. SCORE 0-5

Poor	Fair	Below Average	Average	Above Average	Excellent
0	1	2	3	4	5

A Score of less than 3 in any of above items will represent unsatisfactory completion of internship.

#### 4.4 Extension rules

- Extension of internship: Internship shall be extended by the number of days the students remains absent. These extended days of internship should be completed in the respective external/internal institution.

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- Any other leave other than eligible leave less than six months has to be compensated by extension granted by the principal.

#### 4.5 Details of Training given

##### Sixth Year:

- Internship or residency training including postings in specialty units. Student should independently provide the clinical pharmacy services to the allotted wards.
- Six months in General Medicine department, and Two months each in three other speciality departments.

### 5. ANNEXURES

#### 5.1 Check Lists for Monitoring:

Log Book, Seminar Assessment etc., to be formulated by the curriculum committee of the concerned Institution

#### APPENDIX-A

(See regulation 1.4)

#### CONDITIONS TO BE FULFILLED BY THE ACADEMIC TRAINING INSTITUTION

- 1) Any authority or institution in India applying to the Pharmacy Council of India for approval of courses of study for Pharm.D under sub-section (1) of section 12 of the Pharmacy Act, 1948 shall comply with the infrastructural facilities as prescribed by the Pharmacy Council of India from time to time.
- 2) Pharm.D programmes shall be conducted only in those institutions which -
  - a) are approved by the Pharmacy Council of India for B.Pharm course as provided under section 12 of the Pharmacy Act, 1948;
  - b) have 300 bedded hospital attached to it.

##### (i) Hospital Details

1. Institution with their own hospital of minimum 300 beds.



2. Teaching hospital recognised by the Medical Council of India or University, or a Government hospital not below the level of district headquarter hospital with 300 beds with clearly defined Memorandum of Understanding including housing pharmacy practice department with minimum carpet area of 30 square feet per student along with consent to provide the professional manpower to support the programme.
3. Corporate type hospital with minimum 300 beds with clearly defined Memorandum of Understanding including housing pharmacy practice department with minimum carpet area of 30 square feet per student along with consent to provide the professional manpower to support the programme.
4. Number of institutions which can be attached to one hospital shall be restricted by the student pharmacist to bed ratio of 1:10.

**(ii) Speciality**

- a) Tertiary care hospitals are desirable
- b) Medicine[compulsory], and any three specialization of the following
  1. Surgery
  2. Pediatrics
  3. Gynecology and obstetrics
  4. Psychiatry
  5. Skin and VD
  6. Orthopedics

**(iii) Location of the Hospital**

It should be within the same limits of Corporation or Municipality or Campus with Medical Faculty involvement as adjunct faculty.

In case the hospital and institution are located in different corporations or municipalities or campuses, the distance between the two shall not be more than 30 kms by road.

- (iv) The University shall ascertain that the College is having facilities as per Appendix – A by appointing Technical Expert Committee, constituted for the purpose periodically, for inspection.

**3) TEACHING STAFF REQUIREMENT**

- i) Staff Pattern : All faculty shall be full time. However part time perceptors in hospital shall be allowed.
- ii) Subject wise specialisation of the Teaching Staff :



S.No.	Subject	Specialisation required
1.	Pharmacy Practice	M.Pharm in Pharmacy Practice or Pharmacology or Pharmaceutics.
2.	Human Anatomy & Physiology	M.Pharm in Pharmacology or Pharmacy practice
3.	Pharmaceutics (Dispensing & General Pharmacy)	M.Pharm in Pharmaceutics
4.	Pharmacognosy-I	M.Pharm in Pharmacognosy
5.	Pharmaceutical Organic Chemistry-I	M.Pharm in Pharmaceutical chemistry or Pharmaceutical Analysis or Quality assurance or Bulk Drug
6.	Pharmaceutical Inorganic Chemistry	M.Pharm in Pharmaceutical chemistry or Pharmaceutical Analysis or Quality assurance or Bulk Drug
7.	Pharmaceutical microbiology	M.Pharm in Pharmaceutics or Pharmaceutical Biotechnology
8.	Pathophysiology	M.Pharm Pharmacy practice or Pharmacology
9.	Applied Biochemistry & Clinical Chemistry	M.Pharm in Pharmacology or Pharmacy practice or Pharmaceutical chemistry
10.	Pharmacology-I	M.Pharm in Pharmacology or Pharmacy practice
11.	Pharmaceutical Jurisprudence	M.Pharm in Pharmaceutics
12.	Pharmacology-II	M.Pharm in Pharmacology or Pharmacy practice
13.	Pharmaceutical Dosage Forms	M.Pharm in Pharmaceutics or Industrial Pharmacy
14.	Pharmacotherapeutics -I, II and III	M.Pharm Pharmacy practice or Pharmacology
15.	Community Pharmacy	M.Pharm in Pharmacy practice or Pharmacology or Pharmaceutics

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16.	Hospital Pharmacy	M.Pharm in Pharmacy practice or Pharmacology or Pharmaceutics
17.	Clinical Pharmacy	M.Pharm in Pharmacy practice
18.	Computer Science or Computer Application in pharmacy	MCA
19.	Mathematics	M.Sc. (Maths)

iii) Teaching Staff :

Department/Division	Name of the post	No.
Department of Pharmaceutics	Professor	1
	Asst. Professor	1
	Lecturer	2
Department of Pharmaceutical Chemistry (Including Pharmaceutical Analysis)	Professor	1
	Asst. Professor	1
	Lecturer	3
Department of Pharmacology	Professor	1
	Asst. Professor	1
	Lecturer	2
Department of Pharmacognosy	Professor	1
	Asst. Professor	1
	Lecturer	1
Department of Pharmacy Practice	Professor	1
	Asst. Professor	2
	Lecturer	3

vi) Workload of Faculty : Professor – 8 hrs. per week Assistant Professor – 12 hrs. per week Lecturers – 16 hrs. per week

v) Training of Pharmacy Practice Faculty :

a) Teaching staff will be trained as per the module prescribed by the Central Council.

b) Duration of – Minimum 3 months.



- c) training Training sites - Institutions running pharmacy practice or Programmes for atleast five years.
- d) Trainer - Professor or Assistant Professor with minimum of five years of clinical pharmacy teaching and practice experience.

5) ACCOMMODATION :

Suitable and sufficient accommodation with adequate ventilation, lighting and other hygienic conditions should be provided to the rooms for Principal or the Head of the department, office, class rooms, library, staff, staff common room, students common room, museum, laboratories, stores, etc.

At least two lecture halls alongwith eight laboratories as specified below should be provided for: —

- |   |           |
|---|-----------|
| 1. Pharmaceutics and Pharmacokinetics Lab                   | - 2       |
| 2. Life Science (Pharmacology, Physiology, Pathophysiology) | - 2       |
| 3. Phytochemistry or Pharmaceutical Chemistry               | - 2       |
| 4. Pharmacy Practice  | - 2       |
|   | -----     |
|   | Total = 8 |
|   | -----     |

In addition to the laboratories, balance room, aseptic room or cabinet, animal house and a machine room shall also be provided.

Floor area of the laboratory should not be less than 30 square feet per student required to work in the laboratory at any given time subject to a minimum of 750 square feet.

Laboratories should be fitted and constructed in a manner that these can be kept reasonably clean. Gas and water fittings, shelves, fuming cupboards be provided wherever necessary.

6. EQUIPMENT AND APPARATUS :

Department wise list of minimum equipments

A. DEPARTMENT OF PHARMACOLOGY :

I. Equipment:

S.No.	Name	Minimum required Nos.
1	Microscopes	15
2	Haemocytometer with Micropipettes	20



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3	Sahl's haemocytometer	20
4	Hutchinson's spirometer	01
5	Sphygmomanometer	05
6	Stethoscope	05
7	Permanent Slides for various tissues	One pair of each tissue Organs and endocrine glands One slide of each organ system
8	Models for various organs	One model of each organ system
9	Specimen for various organs and Systems	One model for each organ system
10	Skeleton and bones	One set of skeleton and one spare bone
11	Different Contraceptive Devices and Models	One set of each device
12	Muscle electrodes	01
13	Lucas moist chamber	01
14	Myographic lever	01
15	Stimulator	01
16	Centrifuge	01
17	Digital Balance	01
18	Physical /Chemical Balance	01
19	Sherrington's Kymograph Machine or Polyrite	10
20	Sherrington Drum	10
21	Perspex bath assembly (single unit)	10
22	Aerators	10
23	Computer with LCD	01
24	Software packages for experiment	01
25	Standard graphs of various drugs	Adequate number
26	Actophotometer	01
27	Rotarod	01
28	Pole climbing apparatus	01
29	Analgesiometer (Eddy's hot plate and radiant heat methods)	01
30	Convulsiometer	01
31	Plethysmograph	01



32	Digital pH meter	01
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**II.Apparatus:**

S.No	Name	Minimum required Nos.
1	Folin-Wu tubes	60
2	Dissection Tray and Boards	10
3	Haemostatic artery forceps	10
4	Hypodermic syringes and needles of size 15,24,26G	10
5	Levers, cannulae	20

**NOTE:** Adequate number of glassware commonly used in the laboratory should be provided in each laboratory and department.

**B. DEPARTMENT OF PHARMACOGNOSY :**

**I. Equipment:**

S.No.	Name	Minimum required Nos.
1	Microscope with stage micrometer	15
2	Digital Balance	02
3	Autoclave	02
4	Hot air oven	02
5	B.O.D.incubator	01
6	Refrigerator	01
7	Laminar air flow	01
8	Colony counter	02
9	Zone reader	01
10	Digital pH meter	01
11	Sterility testing unit	01
12	Camera Lucida	15
13	Eye piece micrometer	15
14	Incinerator	01
15	Moisture balance	01
16	Heating mantle	15
17	Flourimeter	01
18	Vacuum pump	02
19	Micropipettes (Single and multi	02





	channeled)	
20	Micro Centrifuge	01
21	Projection Microscope	01

**II. Apparatus:**

S.No.	Name	Minimum required Nos.
1	Reflux flask with condenser	20
2	Water bath	20
3	Clavengers apparatus	10
4	Soxhlet apparatus	10
5	TLC chamber and sprayer	10
6	Distillation unit	01

**NOTE:** Adequate number of glassware commonly used in the laboratory should be provided in each laboratory and department.

**C. DEPARTMENT OF PHARMACEUTICAL CHEMISTRY :**

**I. Equipment:**

S.No.	Name	Minimum required Nos.
1	Hot plates	05
2	Oven	03
3	Refrigerator	01
4	Analytical Balances for demonstration	05
5	Digital balance 10mg sensitivity	10
6	Digital Balance (1mg sensitivity)	01
7	Suction pumps	06
8	Muffle Furnace	01
9	Mechanical Stirrers	10
10	Magnetic Stirrers with Thermostat	10
11	Vacuum Pump	01
12	Digital pH meter	01
13	Microwave Oven	02

**II. Apparatus:**

S.No.	Name	Minimum required Nos.
1	Distillation Unit	02
2	Reflux flask and condenser single	20



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	Necked	
3	Reflux flask and condenser (triple/triple necked)	20
4	Burettes	40
5	Arsenic Limit Test Apparatus	20
6	Nessler's Cylinders	40

**NOTE:** Adequate number of glassware commonly used in the laboratory should be provided in each laboratory and department.

#### D. DEPARTMENT OF PHARMACEUTICS :

##### I. Equipment:

S.No	Name	Minimum required Nos.
1	Mechanical stirrers	10
2	Homogenizer	05
3	Digital balance	05
4	Microscopes	05
5	Stage and eye piece micrometers	05
6	Brockfield's viscometer	01
7	Tray dryer	01
8	Ball mill	01
9	Sieve shaker with sieve set	01
10	Double cone blender	01
11	Propeller type mechanical agitator	05
12	Autoclave	01
13	Steam distillation still	01
14	Vacuum Pump	01
15	Standards sieves, sieve no. 8, 10, 12, 22, 24, 44, 55, 80	10 sets
16	Tablet punching machine	01
17	Capsule filling machine	01
18	Ampoule washing machine	01
19	Ampoule filling and sealing machine	01
20	Tablet disintegration test apparatus IP	01
21	Tablet dissolution test apparatus IP	01



22	Monsanto's hardness tester	01
23	Pfizer type hardness tester	01
24	Friability test apparatus	01
25	Clarity test apparatus	01
26	Ointment filling machine	01
27	Collapsible tube crimping machine	01
28	Tablet coating pan	01
29	Magnetic stirrer, 500ml and 1 liter capacity with speed control	05 EACH 10
30	Digital pH meter	01
31	All purpose equipment with all Accessories	01
32	Aseptic Cabinet	01
33	BOD Incubator	02
34	Bottle washing Machine	01
35	Bottle Sealing Machine	01
36	Bulk Density Apparatus	02
37	Conical Percolator (glass/copper/ stainless steel)	10
38	Capsule Counter	02
39	Energy meter	02
40	Hot Plate	02
41	Humidity Control Oven	01
42	Liquid Filling Machine	01
43	Mechanical stirrer with speed regulator	02
44	Precision Melting point Apparatus	01
45	Distillation Unit	01

## II. Apparatus:

S.No	Name	Minimum required Nos.
1	Ostwald's viscometer	15
2	Stalagmometer	15
3	Desiccator*	05
4	Suppository moulds	20
5	Buchner Funnels (Small, medium, large)	05 each

6	Filtration assembly	01
7	Permeability cups	1%
8	Andrewson's Pipette	03
9	Lipstick moulds	10

**NOTE:** Adequate number of glassware commonly used in the laboratory should be provided in each laboratory and department.

**E. DEPARTMENT OF PHARMACEUTICAL BIOTECHNOLOGY :**

S.No.	Name	Minimum required Nos.
1	Orbital shaker incubator	01
2	Lyophilizer (Desirable)	01
3	Gel Electrophoresis (Vertical and Horizontal)	01
4	Phase contrast/Trinocular Microscope	01
5	Refrigerated Centrifuge	01
6	Fermenters of different capacity (Desirable)	01
7	Tissue culture station	01
8	Laminar airflow unit	01
9	Diagnostic kits to identify infectious agents	01
10	Rheometer	01
11	Viscometer	01
12	Micropipettes (single and multi channeled)	01 each
13	Sonicator	01
14	Respinometer	01
15	BOD Incubator	01
16	Paper Electrophoresis Unit	01
17	Micro Centrifuge	01
18	Incubator water bath	01
19	Autoclave	01
20	Refrigerator	01



21	Filtration Assembly	01
22	Digital pH meter	01

**NOTE:** Adequate number of glassware commonly used in the laboratory should be provided in each laboratory and department.

**F. DEPARTMENT OF PHARMACY PRACTICE : Equipment:**

S.No.	Name	Minimum required Nos.
1	Colorimeter	2
2	Microscope	Adequate
3	Permanent slides (skin, kidney, pancreas, smooth muscle, liver etc.,)	Adequate
4	Watch glass	Adequate
5	Centrifuge	1
6	Biochemical reagents for analysis of normal and pathological constituents in urine and blood facilities	Adequate
7	Filtration equipment	2
8	Filling Machine	1
9	Sealing Machine	1
10	Autoclave sterilizer	1
11	Membrane filter	1 Unit
12	Sintered glass funnel with complete filtering assemble	Adequate
13	Small disposable membrane filter for IV admixture filtration	Adequate
14	Laminar air flow bench	1
15	Vacuum pump	1
16	Oven	1
17	Surgical dressing	Adequate
18	Incubator	1
19	PH meter	1
20	Disintegration test apparatus	1
21	Hardness tester	1
22	Centrifuge	1
23	Magnetic stirrer	1
24	Thermostatic bath	1



**NOTE:**

1. Computers and Internet connection (Broadband), six computers for students with internet and staff computers as required.
2. Adequate number of glassware commonly used in the laboratory should be provided in each laboratory and the department.

**G. CENTRAL INSTRUMENTATION ROOM :**

S.No.	Name	Minimum required Nos.
1	Colorimeter	01
2	Digital pH meter	01
3	UV- Visible Spectrophotometer	01
4	Flourimeter	01
5	Digital Balance (1mg sensitivity)	01
6	Nephelo Turbidity meter	01
7	Flame Photometer	01
8	Potentiometer	01
9	Conductivity meter	01
10	Fourier Transform Infra Red Spectrometer (Desirable)	01
11	HPLC	01
12	HPTLC (Desirable)	01
13	Atomic Absorption and Emission spectrophotometer (Desirable)	01
14	Biochemistry Analyzer (Desirable)	01
15	Carbon, Hydrogen, Nitrogen Analyzer (Desirable)	01
16	Deep Freezer (Desirable)	01
17	Ion- Exchanger	01
18	Lyophilizer (Desirable)	01



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## APPENDIX-B

(See regulation 3)

### CONDITIONS TO BE FULFILLED BY

#### THE EXAMINING AUTHORITY

1. The Examining Authority shall be a statutory Indian University constituted by the Central Government/State Government/Union Territory Administration. It shall ensure that discipline and decorum of the examinations are strictly observed at the examination centers.
2. It shall permit the Inspector or Inspectors of the Pharmacy Council of India to visit and inspect the examinations.
3. It shall provide:-
  - (a) adequate rooms with necessary furniture for holding written examinations;
  - (b) well-equipped laboratories for holding practical examinations;
  - (c) an adequate number of qualified and responsible examiners and staff to conduct and invigilate the examinations; and
  - (d) such other facilities as may be necessary for efficient and proper conduct of examinations.
4. It shall, if so required by a candidate, furnish the statement of marks secured by a candidate in the examinations after payment of prescribed fee, if any, to the Examining Authority.
5. It shall appoint examiners whose qualifications should be similar to those of the teachers in the respective subjects as shown in Appendix-A.
6. In pursuance of sub-section (3) of section 12 of the Pharmacy Act, 1948, the Examining Authority shall communicate to the Secretary, Pharmacy Council of India, not less than six weeks in advance the dates fixed for examinations, the time-table for such examinations, so as to enable the Council to arrange for inspection of the examinations.
7. The Examining Authority shall ensure that examiners for conducting examination for Pharm.D programmes shall be persons possessing pharmacy qualification and are actually involved in the teaching of the Pharm.D programmes in an approved institution.

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**for Courses affiliated to the  
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**Thrissur 680596**



**DOCTOR OF PHARMACY**

**(PHARM D-POST BACCALAUREATE)**

**Course Code 283**

**(2016-17 Academic year onwards)**

**2016**





## 2. COURSE CONTENT

### 2.1. Title of course:

Doctor of Pharmacy (Pharm D – Post Baccalaureate)

### 2.2. Objectives of course

The Doctor of Pharmacy (Pharm D – Post Baccalaureate) education will aim at producing post graduates, having profound knowledge of pharmacy supplemented with knowledge of scientific advances in Modern medicine along with extensive clinical training; who will become efficient and competent health care professional.

The aim of the course is to mould the student to suit the varied requirements of

- i. Practice settings in – Hospital Pharmacy and Community Pharmacy.
- ii. Clinical Pharmacy services
  - a. Patient counseling
  - b. Drug information
  - c. Therapeutic Drug Monitoring(TDM) and Dose calculation
- iii. Academics.
- iv. Regulatory affairs.

### 2.3. Medium of instruction:

The medium of instruction for the course shall be English.

### 2.4. Course outline

I Year	-	12 months
II Year	-	12 months
III Year (rotatory internship)	-	12 months

The course of study for Pharm.D (Post Baccalaureate) shall include the subjects as given in the Tables below. The number of hours in a week, devoted to each subject for its teaching in theory, practical and tutorial shall not be less than that noted against it in columns (3), (4) and (5) below

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Kerala - 686 002, India

### First Year

S.No	Name of Subject	No. of hours of Theory	No. of hours of Practical	No. of hours of Tutorial
(1)	(2)	(3)	(4)	(5)
1.1	Pharmacotherapeutics- I & II	3	3	1
1.2	Pharmacotherapeutics-III	3	3	1
1.3	Hospital Pharmacy	2	3	1
1.4	Clinical Pharmacy	3	3	1
1.5	Biostatistics & Research Methodology	2	-	1
1.6	Biopharmaceutics & Pharmacokinetics	3	3	1
1.7	Clinical Toxicology	2	-	1
	<b>Total hours</b>	<b>18</b>	<b>15</b>	<b>7=(40)</b>

### Second Year

S.No	Name of Subject	No. of hours of Theory	No. of hours of Practical	No. of hours of Tutorial
(1)	(2)	(3)	(4)	(5)
2.1	Clinical Research	3	-	1
2.2	Pharmacoepidemiology and Pharmacoeconomics	3	-	1
2.3	Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring	2	-	1
2.4	Clerkship *	-	-	1
2.5	Project work (Six Months)	-	20	-
	<b>Total hours</b>	<b>8</b>	<b>20</b>	<b>4=(32)</b>

\*Attending ward rounds on daily basis.

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### **Third Year;**

Internship or residency training including postings in speciality units. The student should independently provide the clinical pharmacy services to the allotted wards.

- (i) Six months in General Medicine department, and
- (ii) Two months each in three other speciality departments.

### **2.5. Duration**

Pharm.D. (Post Baccalaureate): The duration of the course shall be for three academic years (two years of study and one year internship or residency) full time with each academic year spread over a period of not less than two hundred (200) working days.

The period of three years duration is divided into two phases –

Phase I – consisting of First and Second academic year.

Phase II – consisting of Internship or residency training during third year involving posting in speciality units. It is a phase of training wherein a student is exposed to actual pharmacy practice or clinical pharmacy services, and acquires skill under supervision so that he or she may become capable of functioning independently.

### **2.6. Syllabus**

As mentioned in "Content of each subject in each year" (clause 2.10)

The concept of health care counselling shall be incorporated in all relevant areas.

### **2.7. Total number of hours**

As mentioned in "Content of each subject in each year" (clause 2.10)

### **2.8. Branches if any, with definition**

As mentioned in "Content of each subject in each year" (clause 2.10)

### **2.9. Teaching, learning methods**

Classroom lectures using Blackboard and PowerPoint presentations.

Teaching with Counselling heads, Case presentations, Seminar, Clerkships and projects and any other methods decided by the respective H.O.D's

### **2.10 Content of each subject in each year**



**2.11 No: of hours per subject (lecture-tutorial-seminar-group discussion)**

As mentioned in "Course outline" (clause 2.4)

**2.12 Practical training**

**Hospital posting.** - Every student shall be posted in constituent hospital for a period of not less than fifty hours to be covered in not less than 200 working days in first year course. Each student shall submit report duly certified by the preceptor and duly attested by the Head of the Department or Institution as prescribed. In the second year, every student shall spend half a day in the morning hours attending ward rounds on daily basis as a part of clerkship. Theory teaching may be scheduled in the afternoon.

**2.13 Records**

Record to be maintained for all practical subjects

**2.14 Dissertation:**

There is no dissertation

**2.15 Speciality training if any**

Not applicable

**2.16 Project work to be done if any**

To allow the student to develop data collection and reporting skills in the area of community, hospital and clinical pharmacy, a project work shall be carried out under the supervision of a teacher. The project topic must be approved by the Head of the Department or Head of the Institution. The same shall be announced to students within one month of commencement of the second year classes. Project work shall be presented in a written report and as a seminar at the end of the year. External and the internal examiners shall do the assessment of the project work. Project work shall comprise of objectives of the work, methodology, results, discussions and conclusions.

**Objectives of project work.**— The main objectives of the project work is to— (i) show the evidence of having made accurate description of published work of others and of having recorded the findings in an impartial manner; and (ii) develop the students in data collection, analysis and reporting and interpretation skills.

**Methodology.**— To complete the project work following methodology shall be adopted, namely:—

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- (i) students shall work in groups of not less than two and not more than four under an authorised teacher;
- (ii) project topic shall be approved by the Head of the Department or Head of the Institution;
- (iii) project work chosen shall be related to the pharmacy practice in community, hospital and clinical setup. It shall be patient and treatment (Medicine) oriented, like drug utilisation reviews, pharmacoepidemiology, pharmacovigilance or pharmacoeconomics;
- (iv) project work shall be approved by the institutional ethics committee;
- (v) student shall present at least three seminars, one in the beginning, one at middle and one at the end of the project work; and
- (vi) two-page write-up of the project indicating title, objectives, methodology anticipated benefits and references shall be submitted to the Head of the Department or Head of the Institution.

**Qualification of Guide:** A postgraduate degree in M.Pharm/PharmD with 5 years experience after P.G is eligible to guide maximum of two groups each group consisting maximum of four students.

#### Reporting

- 1) Student working on the project shall submit jointly to the Head of the Department or Head of the Institution a project report of about 40-50 pages. Project report should include a certificate issued by the authorised teacher, Head of the Department as well as by the Head of the Institution
- 2) Project report shall be computer typed in double space using Times Roman font on A4 paper. The title shall be in bold with font size 18, sub- titles in bold with font size 14 and the text with font size 12. The cover page of the project report shall contain details about the name of the student and the name of the authorised teacher with font size 14.
- 3) Submission of the project report shall be done at least one month prior to the commencement of annual or supplementary examination.

**Evaluation.**— The following methodology shall be adopted for evaluating the project work—

- (i) Project work shall be evaluated by internal and external examiners.
- (ii) Students shall be evaluated in groups for four hours (i.e., about half an hour for a group of four students).

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(iii) Three seminars presented by students shall be evaluated for twenty marks each and the average of best two shall be forwarded to the university with marks of other subjects.

(iv) Evaluation shall be done on the following items: Marks

a) Write up of the seminar	(7.5)
b) Presentation of work	(7.5)
c) Communication skills	(7.5)
d) Question and answer skills	(7.5)
Total	(30 marks)

(v) Final evaluation of project work shall be done on the following items: Marks

a) Write up of the seminar	(17.5)
b) b) Presentation of work	(17.5)
c) c) Communication skills	(17.5)
d) d) Question and answer skills	(17.5)
Total	(70 marks)

Explanation. — For the purposes of differentiation in the evaluation in case of topic being the same for the group of students, the same shall be done based on item numbers b, c and d mentioned above.

**2.17 Any other requirements [CME, Paper Publishing etc.]**

As per the direction of HOD

**2.18 Prescribed/recommended textbooks for each subject**

As mentioned in "Content of each subject in each year" (clause 2.10)

**2.19 Reference books**

As mentioned in "Content of each subject in each year" (clause 2.10)

**2.20 Journals**

All pharmacy and related medical journals

**2.21 Logbook**

Logbook should be maintained wherever necessary

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### 3. EXAMINATIONS

#### 3.1 Eligibility to appear for exams

Only such students who produce certificate from the Head of the Institution in which he or she has undergone the Pharm.D (Post Baccalaureate) course, in proof of his or her having regularly and satisfactorily undergone the course of study by attending not less than 80% of the classes held both in theory and in practical separately in each subject shall be eligible for appearing at examination.

#### 3.2 Schedule of Regular/Supplementary exams

There will be one main examinations and one supplementary examination six months apart in each year.

#### 3.3 Scheme of examination showing maximum marks and minimum marks (Minimum marks should be given)

##### First Year Examination

S. No	Name of Subject	Maximum marks for Theory			Maximum marks for Practical		
		Examination	Sessional	Total	Examination	Sessional	Total
1.1	Pharmacotherapeutics-I & II	70	30	100	70	30	100
1.2	Pharmacotherapeutics-III	70	30	100	70	30	100
1.3	Hospital Pharmacy	70	30	100	70	30	100
1.4	Clinical Pharmacy	70	30	100	70	30	100
1.5	Biostatistics & Research Methodology	70	30	100	-	-	-
1.6	Biopharmaceutics & Pharmacokinetics	70	30	100	70	30	100
1.7	Clinical Toxicology	70	30	100	-	-	-
<b>Total</b>				<b>700</b>			<b>500</b>

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## Second Year Examination

S. No	Name of Subject	Maximum marks for Theory			Maximum marks for Practical		
		Examination	Sessional	Total	Examination	Sessional	Total
2.1	Clinical Research	70	30	100	-	-	-
2.2	Pharmacoepidemiology and Pharmacoeconomics	70	30	100	-	-	-
2.3	Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring	70	30	100	-	-	-
2.4	Clerkship *	-	-	-	70	30	100
2.5	Project work (Six Months)	-	-	-	100**	-	100
<b>Total</b>				<b>300</b>		<b>200</b>	

\*Attending ward rounds on daily basis

\*\*30 marks – viva-voce (oral) 70 marks – Thesis work

### Minimum marks for passing examination:

A student shall not be declared to have passed examination unless he or she secures at least 50% marks in each of the subjects separately in the university theory examinations, practical examinations and 50% marks in each of the theory and internal assessment taken together and 50% in practical examinations including internal assessment marks.

### 3.4 Papers in each year

As mentioned in "Content of each subject in each year" (clause 2.10)

### 3.5 Details of theory exams

Number of papers: As mentioned in "Content of each subject in each year" (clause 2.10)

Duration, Type of questions & number of questions and marks: As mentioned in model question paper as given in curriculum

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- 1) Theory examination shall be of three hours and practical examination shall be of four hours duration.
- 2) Theory examination is for 70 marks consisting of three essay questions each carrying 10 marks (3x10 = 30) and eight short notes each carrying 5 marks (8x5= 40)
- 3) The practical examination shall be evaluated jointly by an internal and an external examiner appointed by the University.
- 4) Practical examination shall also consist of a viva -voce (Oral) examination. 70 marks for practical examination in each subject are inclusive of 10 marks Viva-voce
- 5) A Student who fails in theory or practical examination of a subject shall re- appear both in theory and practical of the same subject.
- 6) Clerkship examination - Oral examination shall be conducted after the completion of clerkship of students. An external and an internal examiner will evaluate the student. Students may be asked to present the allocated medical cases followed by discussion.  
Students' capabilities in delivering clinical pharmacy services, pharmaceutical care planning and knowledge of therapeutics shall be assessed.

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