

SYLLABUS

For Courses affiliated to the
**KERALA UNIVERSITY OF HEALTH
SCIENCES**
Thrissur 680596



BACHELOR OF PHARMACY

Course Code: 009

BACHELOR OF PHARMACY (B. Pharm)
(2017-18 Academic year onwards)

2017

2. COURSE CONTENT

2.1. Title of course:

Bachelor of Pharmacy – B. Pharm

2.2. Objectives of course

The objective of the course is to mold the student to suit the varied requirements of

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

2.3. Medium of instruction:

Medium of instruction and examinations shall be English

2.4. Course Outline

Program/Course credit structure

As per the philosophy of Credit Based Semester System, certain quantum of academic work viz. theory classes, tutorial hours, practical classes, etc. are measured in terms of credits. On satisfactory completion of the courses, a candidate earns credits. The amount of credit associated with a course is dependent upon the number of hours of instruction per week in that course. Similarly, the credit associated with any of the other academic, co/extra-curricular activities is dependent upon the quantum of work expected to be put in for each of these activities per week.

2.4.1. Theory and Laboratory courses

a. Credit assignment

Courses are broadly classified as Theory and Practical. Theory courses consist of lecture (L) and /or tutorial (T) hours, and Practical (P) courses consist of hours spent in the laboratory. Credits (C) for a course is dependent on the number of hours of instruction per week in that course, and is obtained by using a multiplier of one (1) for lecture and tutorial hours, and a multiplier of half (1/2) for practical (laboratory)hours. Thus, for example, a theory course having three lectures and one tutorial per week throughout the semester carries a credit of 4. Similarly, a practical having four laboratory hours per week throughout semester carries a credit of 2.

b. Minimum credit requirements

The minimum credit points required for award of a B. Pharm degree is 210. These credits are divided into Theory courses, Tutorials, Practical, Practice School and Project over the duration of eight semesters. The credits are distributed semester-wise as shown in Table IX. Courses generally progress in sequences, building competencies and their positioning indicates certain academic maturity on the part of the learners. Learners are expected to follow the semester-wise schedule of courses given in the syllabus. The lateral entry students shall get 52 credit points transferred from their D. Pharm program. Such students shall take up additional remedial courses of 'Communication Skills' (Theory and Practical) and 'Computer

Applications in Pharmacy' (Theory and Practical) equivalent to 3 and 4 credit points respectively, a total of 7 credit points to attain 59 credit points, the maximum of I and II semesters.

2.4.2. Academic work

A regular record of attendance both in Theory and Practical shall be maintained by the teaching staff of respective courses.

2.4.3. Course of study

The course of study for B. Pharm shall include Semester Wise Theory & Practical as given in Table-I to VIII. The number of hours to be devoted to each theory, tutorial and practical course in any semester shall not be less than that shown in Table-I to VIII.

Table-I: Course of study for semester I

Course	Name of the Course	No. of hours	Tutorial	Credit points
BP101T	Human Anatomy and Physiology I- Theory	3	1	4
BP102T	Pharmaceutical Analysis I- Theory	3	1	4
BP103T	Pharmaceutics I - Theory	3	1	4
BP104T	Pharmaceutical Inorganic Chemistry - Theory	3	1	4
BP105T	Communication skills - Theory *	2	-	2
BP106RBT	Remedial Biology - Theory *			
BP106RM T	Remedial Mathematics - Theory*	2	-	2
BP107P	Human Anatomy and Physiology - Practical	4	-	2
BP108P	Pharmaceutical Analysis I - Practical	4	-	2
BP109P	Pharmaceutics I - Practical	4	-	2
BP110P	Pharmaceutical Inorganic Chemistry - Practical	4	-	2
BP111P	Communication skills - Practical*	2	-	1
BP112RBP	Remedial Biology - Practical*	2	-	1
	Total	32/34[§]/36[#]	4	27/29[§]/30[#]

[#] Applicable ONLY for the students who have studied Mathematics / Physics / Chemistry at HSC and appearing for Remedial Biology (RB)course.

[§]Applicable ONLY for the students who have studied Physics / Chemistry / Botany / Zoology at HSC and appearing for Remedial Mathematics (RM)course.

* Non University Examination (NUE)

Table-II: Course of study for semester II

Course	Name of the Course	No. of hours	Tutorial	Credit points
BP201T	Human Anatomy and Physiology II – Theory	3	1	4
BP202T	Pharmaceutical Organic Chemistry I – Theory	3	1	4
BP203T	Biochemistry – Theory	3	1	4
BP204T	Pathophysiology – Theory	3	1	4
BP205T	Computer Applications in Pharmacy – Theory *	3	-	3
BP206T	Environmental sciences – Theory *	3	-	3
BP207P	Human Anatomy and Physiology II – Practical	4	-	2
BP208P	Pharmaceutical Organic Chemistry I – Practical	4	-	2
BP209P	Biochemistry – Practical	4	-	2
BP210P	Computer Applications in Pharmacy – Practical*	2	-	1
Total		32	4	29

*Non University Examination (NUE)

Table-III: Course of study for semester III

Course	Name of the Course	No. of hours	Tutorial	Credit points
BP301T	Pharmaceutical Organic Chemistry II – Theory	3	1	4
BP302T	Physical Pharmaceutics I – Theory	3	1	4
BP303T	Pharmaceutical Microbiology – Theory	3	1	4
BP304T	Pharmaceutical Engineering – Theory	3	1	4
BP305P	Pharmaceutical Organic Chemistry II – Practical	4	-	2
BP306P	Physical Pharmaceutics I – Practical	4	-	2
BP307P	Pharmaceutical Microbiology – Practical	4	-	2
BP 308P	Pharmaceutical Engineering – Practical	4	-	2
Total		28	4	24

Table-IV: Course of study for semester IV

Course	Name of the Course	No. of hours	Tutorial	Credit points
BP401T	Pharmaceutical Organic Chemistry III- Theory	3	1	4
BP402T	Medicinal Chemistry I – Theory	3	1	4
BP403T	Physical Pharmaceutics II – Theory	3	1	4
BP404T	Pharmacology I – Theory	3	1	4
BP405T	Pharmacognosy and Phytochemistry I- Theory	3	1	4
BP406P	Medicinal Chemistry I – Practical	4	-	2
BP407P	Physical Pharmaceutics II – Practical	4	-	2
BP408P	Pharmacology I – Practical	4	-	2
BP409P	Pharmacognosy and Phytochemistry I – Practical	4	-	2
	Total	31	5	28

Table-V: Course of study for semester V

Course	Name of the Course	No. of hours	Tutorial	Credit points
BP501T	Medicinal Chemistry II – Theory	3	1	4
BP502T	Formulative Pharmacy- Theory	3	1	4
BP503T	Pharmacology II – Theory	3	1	4
BP504T	Pharmacognosy and Phytochemistry II- Theory	3	1	4
BP505T	Pharmaceutical Jurisprudence – Theory	3	1	4
BP506P	Formulative Pharmacy – Practical	4	-	2
BP507P	Pharmacology II – Practical	4	-	2
BP508P	Pharmacognosy and Phytochemistry II – Practical	4	-	2
	Total	27	5	26

Table-VI: Course of study for semester VI

Course	Name of the Course	No. of hours	Tutorial	Credit points
BP601T	Medicinal Chemistry III – Theory	3	1	4
BP602T	Pharmacology III – Theory	3	1	4
BP603T	Herbal Drug Technology – Theory	3	1	4
BP604T	Biopharmaceutics and Pharmacokinetics – Theory	3	1	4
BP605T	Pharmaceutical Biotechnology – Theory	3	1	4
BP606T	Quality Assurance – Theory	3	1	4
BP607P	Medicinal chemistry III – Practical	4	-	2
BP608P	Pharmacology III – Practical	4	-	2
BP609P	Herbal Drug Technology – Practical	4	-	2
	Total	30	6	30

Table-VII: Course of study for semester VII

Course	Name of the Course	No. of hours	Tutorial	Credit points
BP701T	Instrumental Methods of Analysis – Theory	3	1	4
BP702T	Industrial Pharmacy – Theory	3	1	4
BP703T	Pharmacy Practice – Theory	3	1	4
BP704T	Novel Drug Delivery System – Theory	3	1	4
BP705P	Instrumental Methods of Analysis – Practical	4	-	2
BP706PS	Practice School*	12	-	6
	Total	28	4	24

* Non University Examination (NUE)

Table-VIII: Course of study for semester VIII

Course	Name of the Course	No. of hours	Tutorial	Credit points
BP801T	Biostatistics and Research Methodology	3	1	4
BP802T	Social and Preventive Pharmacy	3	1	4
BP803ET	Pharmaceutical Marketing	3 + 3 = 6	1 + 1 = 2	4 + 4 = 8
BP804ET	Pharmaceutical Regulatory Science			
BP805ET	Pharmacovigilance			
BP806ET	Quality Control and Standardization of Herbs			
BP807ET	Computer Aided Drug Designing			
BP808ET	Cell and Molecular Biology			
BP809ET	Cosmetic Science			
BP810ET	Experimental Pharmacology			
BP811ET	Advanced Instrumentation Techniques			
BP812PW	Project work	12	-	6
	Total	24	4	22

Table-IX: Semester wise credits distribution

Semester	Credit Points
I	27/29 ^S /30 [#]
II	29
III	24
IV	28
V	26
VI	30
VII	24
VIII	22
Extracurricular/ Co curricular activities	01*
Total credit points for the program	211/213^S/214[#]

* The credit points assigned for extracurricular and or co-curricular activities shall be given by the Principals of the colleges and the same shall be submitted to the University. The criteria to acquire this credit point shall be defined by the colleges from time to time.

^S Applicable ONLY for the students studied Physics / Chemistry / Botany / Zoology at HSC and appearing for Remedial Mathematics course.

[#] Applicable ONLY for the students studied Mathematics / Physics / Chemistry at HSC and appearing for Remedial Biology course.

2.4.4. Examinations/Assessments

The scheme for internal assessment and end semester examinations is given in Table-X.

2.4.5. End semester examinations

The End Semester Examinations for each theory and practical course through semesters I to VIII shall be conducted by the university except for the subjects with asterix symbol (*) in table I and II for which examinations shall be conducted by the subject experts at college level and the marks/grades shall be submitted to the university.

Tables-X: Schemes for internal assessments and end semester examinations semester wise
Semester I

Course code	Name of the course	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration	
			Marks	Duration				
BP101T	Human Anatomy and Physiology I-Theory	10	15	1Hr	25	75	3Hrs	100
BP102T	Pharmaceutical Analysis I-Theory	10	15	1Hr	25	75	3Hrs	100
BP103T	Pharmaceutics I-Theory	10	15	1Hr	25	75	3Hrs	100
BP104T	Pharmaceutical Inorganic Chemistry-Theory	10	15	1Hr	25	75	3Hrs	100
BP105T	Communication skills-Theory*	5	10	1Hr	15	35	1.5Hrs	50
BP106RBT BP106RMT	Remedial Biology/Mathematics-Theory*	5	10	1Hr	15	35	1.5Hrs	50
BP107P	Human Anatomy and Physiology-Practical	5	10	4Hrs	15	35	4Hrs	50
BP108P	Pharmaceutical Analysis I-Practical	5	10	4Hrs	15	35	4Hrs	50
BP109P	Pharmaceutics I-Practical	5	10	4Hrs	15	35	4Hrs	50
BP110P	Pharmaceutical Inorganic Chemistry-Practical	5	10	4Hrs	15	35	4Hrs	50
BP111P	Communication skills-Practical*	5	5	2Hrs	10	15	2Hrs	25
BP112RBP	Remedial Biology-Practical*	5	5	2Hrs	10	15	2Hrs	25
Total		70/75\$/80#	115/125\$/130#	23/24\$/26# Hrs.	185/200\$/210#	490/525\$/540#	31.5/33\$/35# 35# Hrs	675/725\$/750#

Semester II

Course code	Name of the course	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration	
			Marks	Duration				
BP201T	Human Anatomy and Physiology II – Theory	10	15	1Hr	25	75	3Hrs	100
BP202T	Pharmaceutical Organic Chemistry I – Theory	10	15	1Hr	25	75	3Hrs	100
BP203T	Biochemistry – Theory	10	15	1Hr	25	75	3Hrs	100
BP204T	Pathophysiology – Theory	10	15	1Hr	25	75	3Hrs	100
BP205T	Computer Applications in Pharmacy – Theory*	10	15	1Hr	25	50	2Hrs	75
BP206T	Environmental sciences – Theory*	10	15	1Hr	25	50	2Hrs	75
BP207P	Human Anatomy and Physiology II – Practical	5	10	4Hrs	15	35	4Hrs	50
BP208P	Pharmaceutical Organic Chemistry I – Practical	5	10	4Hrs	15	35	4Hrs	50
BP209P	Biochemistry – Practical	5	10	4Hrs	15	35	4Hrs	50
BP210P	Computer Applications in Pharmacy – Practical*	5	5	2Hrs	10	15	2Hrs	25
Total		80	125	20Hrs	205	520	30Hrs	725

* The subject experts at college level shall conduct examinations

Semester III

Course	Name of the course	Internal Assessment				End Semester Exams			Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration		
			Marks	Duration					
BP301T	Pharmaceutical Organic Chemistry II – Theory	10	15	1Hr	25	75	3Hrs	100	
BP302T	Physical Pharmaceutics I – Theory	10	15	1Hr	25	75	3Hrs	100	
BP303T	Pharmaceutical Microbiology – Theory	10	15	1Hr	25	75	3Hrs	100	
BP304T	Pharmaceutical Engineering – Theory	10	15	1Hr	25	75	3Hrs	100	
BP305P	Pharmaceutical Organic Chemistry II – Practical	5	10	4Hr	15	35	4Hrs	50	
BP306P	Physical Pharmaceutics I – Practical	5	10	4Hr	15	35	4Hrs	50	
BP307P	Pharmaceutical Microbiology – Practical	5	10	4Hr	15	35	4Hrs	50	
BP308P	Pharmaceutical Engineering – Practical	5	10	4Hr	15	35	4Hrs	50	
	Total	60	100	20	160	440	28Hrs	600	

Semester IV

Course	Name of the course	Internal Assessment				End Semester Exams			Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration		
			Marks	Duration					
BP401T	Pharmaceutical Organic Chemistry III-Theory	10	15	1Hr	25	75	3Hrs	100	
BP402T	Medicinal Chemistry I-Theory	10	15	1Hr	25	75	3Hrs	100	
BP403T	Physical Pharmaceutics II-Theory	10	15	1Hr	25	75	3Hrs	100	
BP404T	Pharmacology I-Theory	10	15	1Hr	25	75	3Hrs	100	
BP405T	Pharmacognosy I-Theory	10	15	1Hr	25	75	3Hrs	100	
BP406P	Medicinal Chemistry I-Practical	5	10	4Hr	15	35	4Hrs	50	
BP407P	Physical Pharmaceutics II-Practical	5	10	4Hrs	15	35	4Hrs	50	
BP408P	Pharmacology I-Practical	5	10	4Hrs	15	35	4Hrs	50	
BP409P	Pharmacognosy I-Practical	5	10	4Hrs	15	35	4Hrs	50	
	Total	70	115	21Hrs	185	515	31Hrs	700	

Semester V

Course code	Name of the course	Internal Assessment				End Semester Exams			Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration		
			Marks	Duration					
BP501T	Medicinal Chemistry II-Theory	10	15	1Hr	25	75	3Hrs	100	
BP502T	Formulative Pharmacy-Theory	10	15	1Hr	25	75	3Hrs	100	
BP503T	Pharmacology II-Theory	10	15	1Hr	25	75	3Hrs	100	
BP504T	Pharmacognosy II-Theory	10	15	1Hr	25	75	3Hrs	100	
BP505T	Pharmaceutical Jurisprudence - Theory	10	15	1Hr	25	75	3Hrs	100	
BP506P	Formulative Pharmacy -Practical	5	10	4Hr	15	35	4Hrs	50	
BP507P	Pharmacology II-Practical	5	10	4Hr	15	35	4Hrs	50	
BP508P	Pharmacognosy II-Practical	5	10	4Hr	15	35	4Hrs	50	
	Total	65	105	17Hr	170	480	27Hrs	650	

Semester VI

Course code	Name of the course	Internal Assessment				End Semester Exams			Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration		
			Marks	Duration					
BP601T	Medicinal Chemistry III-Theory	10	15	1Hr	25	75	3Hrs	100	
BP602T	Pharmacology III-Theory	10	15	1Hr	25	75	3Hrs	100	
BP603T	Herbal Drug Technology -Theory	10	15	1Hr	25	75	3Hrs	100	
BP604T	Biopharmaceutics and Pharmacokinetics-Theory	10	15	1Hr	25	75	3Hrs	100	
BP605T	Pharmaceutical Biotechnology-Theory	10	15	1Hr	25	75	3Hrs	100	
BP606T	Quality Assurance-Theory	10	15	1Hr	25	75	3Hrs	100	
BP607P	Medicinal chemistry III -Practical	5	10	4Hrs	15	35	4Hrs	50	
BP608P	Pharmacology III-Practical	5	10	4Hrs	15	35	4Hrs	50	
BP609P	Herbal Drug Technology - Practical	5	10	4Hrs	15	35	4Hrs	50	
	Total	75	120	18Hrs	195	555	30Hrs	750	

Semester VII

Course code	Name of the course	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration	
			Marks	Duration				
BP701T	Instrumental Methods of Analysis – Theory	10	15	1Hr	25	75	3Hrs	100
BP702T	Industrial Pharmacy – Theory	10	15	1Hr	25	75	3Hrs	100
BP703T	Pharmacy Practice – Theory	10	15	1Hr	25	75	3Hrs	100
BP704T	Novel Drug Delivery System – Theory	10	15	1Hr	25	75	3Hrs	100
BP705P	Instrumental Methods of Analysis – Practical	5	10	4Hrs	15	35	4Hrs	50
BP706PS	Practice School*	25	-	-	25	125	5Hrs	150
	Total	70	70	8Hrs	140	460	21Hrs	600

* The subject experts at college level shall conduct examinations

Semester VIII

Course code	Name of the course	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration	
			Marks	Duration				
BP801T	Biostatistics and Research Methodology –Theory	10	15	1Hr	25	75	3Hrs	100
BP802T	Social and Preventive Pharmacy– Theory	10	15	1Hr	25	75	3Hrs	100
BP803ET	Pharmaceutical Marketing–Theory							
BP804ET	Pharmaceutical Regulatory Science –Theory							
BP805ET	Pharmacovigilance–Theory							
BP806ET	Quality Control and Standardizations of Herbs– Theory	10+10 =20	15+15= 30	1+1= 2 Hrs	25+25= 50	75+75 =150	3+3=6 Hrs	100+ 100= 200
BP807ET	Computer Aided Drug Design–Theory							
BP808ET	Cell and Molecular Biology –Theory							
BP809ET	Cosmetic Science–Theory							
BP810ET	Experimental Pharmacology–Theory							
BP811ET	Advanced Instrumentation Techniques–Theory							
BP812PW	Project Work						4Hrs	150
	Total	40	60	4hrs	100	450	16	550

2.4.6. Internal assessment: Continuous mode

The marks allocated for Continuous mode of Internal Assessment shall be awarded as per the scheme given below.

Table-XI: Scheme for awarding internal assessment: Continuous mode

Theory		
Criteria	Maximum Marks	
Attendance (Refer Table-XII)	4	2
Academic activities(Average of any 3 activities e.g. quiz, assignment, open Book test, field work, group discussion and seminar)	3	1.5
Student-Teacher interaction	3	1.5
Total	10	5
Practical		
Attendance (Refer Table-XII)	2	
Based on Practical Records, Regular viva voce, etc.	3	
Total	5	

Table- XII: Guidelines for the allotment of marks for attendance

Percentage of Attendance	Theory	Practical
95-100	4	2
90-94	3	1.5
85-89	2	1
80-84	1	0.5
Less than 80	0	0

2.4.7. Sessional Exams

Two Sessional exams shall be conducted for each theory/practical course as per the schedule fixed by the college(s). The scheme of question paper for theory and practical Sessional examinations is given below. The average marks of two Sessional exams shall be computed for internal assessment as per the requirements given in tables-X. Sessional exam shall be conducted for 30 marks for theory and shall be computed for 15marks. Similarly, Sessional exam for practical shall be conducted for 40 marks and shall be computed for 10 marks.

2.4.17. Project work

All the students shall undertake a project under the supervision of a teacher and submit a report.

The area of the project shall directly relate any one of the elective subject opted by the student in semester VIII. The project shall be carried out in group not exceeding 5 in number. The project report shall be submitted in triplicate (typed & bound copy not less than 25 pages).

The internal and external examiner appointed by the University shall evaluate the project at the time of the Practical examinations of other semester(s). Students shall be evaluated in groups for four hours (i.e., about half an hour for a group of five students). The projects shall be evaluated as per the criteria given below.

Objective(s) of the work done	15Marks
Methodology adopted	20Marks
Results and Discussions	20Marks
Conclusions and Outcomes	20Marks

Total	75Marks
 <i>Evaluation of Presentation:</i>	
Presentation of work	25Marks
Communication skills	20Marks
Question and answer skills	30Marks

Total	75Marks

Explanation: The 75 marks assigned to the dissertation book shall be same for all the students in a group. However, the 75 marks assigned for presentation shall be awarded based on the performance of individual students in the given criteria.

2.4.18. Industrial training

Every candidate shall be required to work for at least 150 hours spread over four weeks in a Pharmaceutical Industry/Hospital. It includes Production unit, Quality Control department, Quality Assurance department, Analytical laboratory, Chemical manufacturing unit, Pharmaceutical R&D, Hospital (Clinical Pharmacy), Clinical Research Organization, Community Pharmacy, etc. After the Semester-VI and before the commencement of Semester-VII, and shall submit satisfactory report of such work and certificate duly signed by the authority of training organization to the head of the institute.

2.4.19. Practice School

In the VII semester, every candidate shall undergo practice school for a period of 150 hours evenly distributed throughout the semester. The student shall opt any one of the domains for practice school declared by the program committee from time to time.

At the end of the practice school, every student shall submit a printed report (in triplicate) on the practice school he/she attended (not more than 25 pages). Along with the exams of semester VII, the report submitted by the student, knowledge and skills acquired by the student through practice school shall be evaluated by the subject experts at college level and grade point shall be awarded.

2.4.20. Award of Ranks

Ranks and Medals shall be awarded on the basis of final CGPA. However, candidates who fail in one or more courses during the B. Pharm program shall not be eligible for award of ranks. Moreover, the candidates should have completed the B. Pharm program in minimum prescribed number of years, (four years) for the award of Ranks.

2.4.21. Award of degree

Candidates who fulfill the requirements mentioned above shall be eligible for award of degree during the ensuing convocation.

2.5. Duration of the program

The course of study for B. Pharm shall extend over a period of eight semesters (four academic years) and six semesters (three academic years) for lateral entry students. The curricula and syllabi for the program shall be prescribed from time to time by Pharmacy Council of India, New Delhi.

2.5.1. Duration for completion of the program of study

The duration for the completion of the program shall be fixed as double the actual duration of the program and the students have to pass within the said period, otherwise they have to get fresh Registration.

2.5.2. Re-admission after break of study

Candidate who seeks re-admission to the program after break of study has to get the approval from the university by paying a condonation fee.

No condonation is allowed for the candidate who has more than 2 years of break up period and he/she has to rejoin the program by paying the required fees.

**REGULATIONS 2019:
COURSE CONTENT AND EXAMINATIONS**

KERALA UNIVERSITY OF HEALTHSCIENCES
Thrissur -680596



POST GRADUATE COURSE IN PHARMACY
Master of Pharmacy (M.Pharm.)

(2019-20 Academic year onwards)

2019

II. COURSE CONTENT

2.1 Title of the course

These regulations shall be called as “Master of Pharmacy (M. Pharm.) Degree Program - Credit Based Semester System (CBSS) 2019” of the “Kerala University of Health Sciences” (M.Pharm-CBSS 2019). They shall come into effect from the Academic Year 2019-20. The regulations framed are subject to modifications from time to time by the authorities of the Kerala University of Health Sciences, Thrissur (hereinafter mentioned as the University).

2.2 Objectives of course

To generate Pharmacy Post Graduates with profound knowledge in various branches of Pharmaceutical Sciences to meet with the rapidly increasing demands in

- Pharmaceutical Manufacturing & Technology
- Pharmaceutical & Herbal Drug Research
- Pharmaceutical & Herbal Formulation Development
- Computer aided Drug design and Development
- Clinical research including Preclinical & Clinical studies.
- Pharmaceutical Drug Analysis
- Clinical Toxicology & Toxicological Analysis
- Drug Regulatory affairs

To discover the potential to become Faculty in Pharmaceutical Sciences with unmatched quality and excellence, so as to educate the future pharmacy generation (Undergraduate, Post graduate, and Doctoral candidates).

2.3 Medium of Instruction

Medium of instruction and examination shall be in English.

2.4 Course Outline

The specialisations in M.Pharm. Program is given in Table 1.

Table – 1: M.Pharm. Specialisation and their code

S.No	KUHS Course Code	Specialisation	Specialisation Code
1.	276	Pharmaceutics	MPH
2.	277	Pharmaceutical Chemistry	MPC
3.	278	Pharmacognosy	MPG
4.	279	Pharmaceutical Analysis	MPA
5.	280	Pharmacology	MPL
6.	281	Pharmacy Practice	MPP

Table – 2b: Course of study for M.Pharm.Pharmaceutical Chemistry I & II Semester

MPC	PHARMACEUTICAL CHEMISTRY				
Course Code	Course	Credit Hours	Credit Points	Hrs./wk	Marks
Semester I					
MPT101T	Modern Pharmaceutical Analytical Techniques	4	4	4	100
MPC 102T	Advanced Organic Chemistry –I	4	4	4	100
MPC 103T	Advanced Medicinal Chemistry	4	4	4	100
MPC 104T	Chemistry of Natural Products	4	4	4	100
MPC 105P	Pharmaceutical Chemistry Practical – I	12	6	12	150
-	Seminar /Assignment	7	4	7	100
Total		35	26	35	650
Semester II					
MPC 201T	Advanced Spectral Analysis	4	4	4	100
MPC 202T	Advanced Organic Chemistry –II	4	4	4	100
MPC 203T	Computer Aided Drug Design	4	4	4	100
MPC 204T	Pharmaceutical Process Chemistry	4	4	4	100
MPC 205P	Pharmaceutical Chemistry Practical II	12	6	12	150
-	Seminar /Assignment	7	4	7	100
Total		35	26	35	650

Table – 2e: Course of study for M.Pharm. Pharmacology I & II Semester

MPL	PHARMACOLOGY				
Course Code	Course	Credit Hours	Credit Points	Hrs./wk	Marks
Semester I					
MPT101T	Modern Pharmaceutical Analytical Techniques	4	4	4	100
MPL 102T	Advanced Pharmacology-I	4	4	4	100
MPL 103T	Pharmacological and Toxicological Screening Methods-I	4	4	4	100
MPL 104T	Cellular and Molecular Pharmacology	4	4	4	100
MPL 105P	Pharmacology Practical -I	12	6	12	150
-	Seminar /Assignment	7	4	7	100
Total		35	26	35	650
Semester II					
MPL 201T	Advanced Pharmacology II	4	4	4	100
MPL 202T	Pharmacological and Toxicological Screening Methods -II	4	4	4	100
MPL 203T	Principles of Drug Discovery	4	4	4	100
MPL 204T	Clinical research and Pharmacovigilance	4	4	4	100
MPL 205P	Pharmacology Practical -II	12	6	12	150
-	Seminar /Assignment	7	4	7	100
Total		35	26	35	650

Table – 2f: Course of study for M.Pharm. Pharmacy Practicel & II Semester

MPP	PHARMACY PRACTICE				
Course Code	Course	Credit Hours	Credit Points	Hrs./wk	Marks
Semester I					
MPP101T	Clinical Pharmacy Practice	4	4	4	100
MPP102T	Pharmacotherapeutics-I	4	4	4	100
MPP103T	Hospital & Community Pharmacy	4	4	4	100
MPP104T	Clinical Research	4	4	4	100
MPP105P	Pharmacy Practice Practical I	12	6	12	150
-	Seminar /Assignment	7	4	7	100
Total		35	26	35	650
Semester II					
MPP201T	Principles of Quality use of Medicines	4	4	4	100
MPP202T	Pharmacotherapeutics II	4	4	4	100
MPP203T	Clinical Pharmacokinetics and therapeutic Drug Monitoring	4	4	4	100
MPP204T	Pharmacoepidemiology & Pharmacoconomics	4	4	4	100
MPP205P	Pharmacy Practice Practical II	12	6	12	150
-	Seminar /Assignment	7	4	7	100
Total		35	26	35	650

Table – 3: Course of study for M. Pharm. III & IV Semester(Common for all Specialisations)

Course Code	Course	Credit Hours	Credit Points
Semester III			
MRM 301T	Research Methodology and Biostatistics	4	4
-	Journal Club	1	1
-	Discussion / Presentation(ProposalPresentation)	2	2
-	Research Work	28	14
Total		35	21
Semester IV			
-	Journal Club	1	1
-	Presubmission Discussion / Presentation	3	3
-	Research Work	31	16
Total		35	20

Program/Course credit structure

As per the philosophy of Credit Based Semester System, certain quantum of academic work viz. theory classes, practical classes, seminars, assignments, etc. are measured in terms of credits. On satisfactory completion of the courses, a candidate earns credits. The amount of credit associated with a course is dependent upon the number of hours of instruction per week in that course. Similarly the credit associated with any of the other academic, co/extracurricular activities is dependent upon the quantum of work expected to be put in for each of these activities per week/per activity.

Credit assignment

a) Theory and Laboratory courses

Courses are broadly classified as Theory and Practical. Theory courses consist of lecture (L) and Practical (P) courses consist of hours spent in the laboratory. Credits (C) for a course is dependent on the number of hours of instruction per week in that course, and is obtained by using a multiplier of one (1) for lecture and a multiplier of half (1/2) for practical (laboratory) hours. Thus, for example, a theory course having four lectures per week throughout the semester carries a credit of 4. Similarly, a practical having four laboratory hours per week throughout semester carries a credit of 2. The contact hours of seminars, assignments and research work shall be treated as that of practical courses for the purpose of calculating credits, i.e., the contact hours shall be multiplied by 1/2. Similarly, the contact hours of journal club, research work presentations and discussions with the supervisor shall be considered as theory course and multiplied by 1.

b) Minimum credit requirements

The minimum credit points required for the award of M. Pharm. degree is 95. However based on the credit points earned by the students under co- curricular activities, a student shall earn a maximum of 100 credit points. These credits are divided into Theory courses, Practical, Seminars, Assignments, Research work, Discussions with the supervisor, Journal club and Co-

Curricular activities over the duration of four semesters. The credits are distributed semester-wise as shown in Table 4.

Courses generally progress in sequence, building competencies and their positioning indicates certain academic maturity on the part of the learners. Learners are expected to follow the semester-wise schedule of courses given in the syllabus.

Table – 4: Semester wise credits distribution

Semester	Credit Points
I	26
II	26
III	21
IV	20
Co-curricular Activities* (attending Conference, Scientific Presentations and other scholarly Activities)	Minimum = 02 Maximum = 07
Total Credit Points	Minimum = 95 Maximum = 100

*Credit points assigned for co-curricular activities shall be given by the Principals of Colleges and the same shall be submitted to the University along with the attendance and marks scored by the candidates in semester IV.

Table – 5: Guidelines for Awarding Credit Points for Co-Curricular Activities

Name of the Activity	Maximum Credit Points Eligible/Activity
Participation in National Level Seminar/ Conference/ Workshop/Symposium/Training Programmes(related to the specialization of the student)	01
Participation in International* Level Seminar/ Conference/Workshop/ Symposium/ Training Programs(related to the specialization of the student)	02
Academic Award/Research Award from State Level/National Agencies	01
Academic Award/Research Award from International Agencies	02
Research/Review Publication in National Journals (Indexed in Scopus/Web of Science)/ National Level Seminar/ Conference/ Workshop/Symposium/Training Programmes(related to the specialization of the student)	01
Research/Review Publication in International* Journals (Indexed in Scopus/Web of Science)/ International* Level Seminar/ Conference/Workshop/ Symposium/ Training Programs (related to the specialization of the student)	02

* International Conference: Conference in which resource persons from two or more nations or nationalities participate.
International Journal: One quarter of editorial board is from an outside nation/ one third of papers published originate from an outside nation.

Program Committee

The M. Pharm. programme shall have a Programme Committee constituted by the Head of the institution in consultation with all the Heads of the departments.

The composition of the Programme Committee shall be as follows:

A teacher at the cadre of Professor shall be the Chairperson; One Teacher from each M. Pharm specialization and four student representatives (two from each academic year), nominated by the Head of the institution.

Duties of the Programme Committee:

- Periodically reviewing the progress of the classes.
- Discussing the problems concerning curriculum, syllabus and the conduct of classes.
- Discussing with the course teachers on the nature and scope of assessment for the course and the same shall be announced to the students at the beginning of respective semesters.
- Communicating its recommendation to the Head of the institution on academic matters.
- The Programme Committee shall meet at least twice in a semester preferably at the end of each sessional exam and before the end semester exam.

2.5 Duration

The program of study for M.Pharm. shall extend over a period of four semesters (two academic years). The curricula and syllabi for the program shall be prescribed from time to time by the Kerala University of Health sciences.

The duration for the completion of the program shall be fixed as double the actual duration of the program and the students have to pass within the said period, otherwise they have to get fresh Registration.

2.6 Syllabus

Given separately for each specialisation.

2.7 Total number of hours

As mentioned in Course outline (clause 2.4)

2.8 Branches if any, with definition

As mentioned in Syllabus (clause 2.6)

2.9 Teaching Learning methods

A regular record of attendance both in Theory, Practical, Seminar, Assignment, Journal club, Discussion with the supervisor, Research work presentation and Dissertation shall be maintained by the department / teaching staff of respective courses.

2.10 Content of each subject in each year

As mentioned in Syllabus (clause 2.6)

2.11 Number of hours per subject

As mentioned in Syllabus (clause 2.6)

2.12 Practical Training

As mentioned in Course outline (clause 2.4)

2.13 Records

To be maintained for all Practical Work

2.14 Dissertation

As mentioned in Project work to be done (clause 2.16)

2.15 Speciality Training if any

As mentioned in Syllabus (clause 2.6)

2.16 Project work to be done if any

All the students shall submit a thesis/dissertation on the basis of regular research work in Semester III to IV under the supervision of a teacher (project guide). The format for printing the thesis is given in Annexure 4.

The Internal Examiner (project guide) and External Examiner appointed by the University shall evaluate the project at the end of Fourth semester. (Annexure 4)

2.17 Any other Requirements [CME, Paper Publishing, etc.,]

As mentioned in Course outline (clause 2.4)

2.18 Prescribed/Recommended textbooks for each subject

As mentioned in Syllabus (clause 2.6)

2.19 Reference books

As mentioned in Syllabus (clause 2.6)

2.20 Journals

All Pharmacy and related Medical Journals

2.21 Logbook

Registers to be maintained :

The Institution have to maintain registers for student activities such as Seminar/Assignment (Semester I & Semester II), Journal club presentation (Semester III & Semester IV), Minutes of Research Monitoring committee (Semester III & Semester IV), and Co-curricular activities (Semester I to IV) in addition to the mandatory general records as specified by the University from time to time.

Table – 7b: Schemes for internal assessments and end semester examination

MPC		PHARMACEUTICAL CHEMISTRY							
Course code	Course	Internal Assessment				End Semester Exams		Total Marks	
		Continuous Mode	Sessional Exams		Total	Marks	Duration		
			Marks	Duration					
SEMESTER I									
MPT101T	Modern Pharmaceutical Analytical Techniques	10	15	1 Hr	25	75	3 Hrs	100	
MPC 102T	Advanced Organic Chemistry –I	10	15	1 Hr	25	75	3 Hrs	100	
MPC 103T	Advanced Medicinal Chemistry	10	15	1 Hr	25	75	3 Hrs	100	
MPC 104T	Chemistry of Natural Products	10	15	1 Hr	25	75	3 Hrs	100	
MPC 105P	Pharmaceutical Chemistry Practical – I	20	30	6 Hrs	50	100	6 Hrs	150	
-	Seminar /Assignment*	-	-	-	100	-	-	100	
Total								650	
SEMESTER II									
MPC 201T	Advanced Spectral Analysis	10	15	1 Hr	25	75	3 Hrs	100	
MPC 202T	Advanced Organic Chemistry –II	10	15	1 Hr	25	75	3 Hrs	100	
MPC 203T	Computer Aided Drug Design	10	15	1 Hr	25	75	3 Hrs	100	
MPC 204T	Pharmaceutical Process Chemistry	10	15	1 Hr	25	75	3 Hrs	100	
MPC 205P	Pharmaceutical Chemistry Practical II	20	30	6 Hrs	50	100	6 Hrs	150	
-	Seminar /Assignment*	-	-	-	100	-	-	100	
Total								650	
*In the case of "Seminar/Assignment" of Semester I and II, the total marks is split up as 25 marks each for the 4 theory courses, out of which 10 marks are awarded for seminars and 15 marks awarded for assignment, based on the syllabus of the respective theory course.									

Table – 7c: Schemes for internal assessments and end semester examination

MPL		PHARMACOLOGY							
Course code	Course	Internal Assessment				End Semester Exams		Total Marks	
		Continuous Mode	Sessional Exams		Total	Marks	Duration		
			Marks	Duration					
SEMESTER I									
MPT101T	Modern Pharmaceutical Analytical Techniques	10	15	1 Hr	25	75	3 Hrs	100	
MPL 102T	Advanced Pharmacology-I	10	15	1 Hr	25	75	3 Hrs	100	
MPL 103T	Pharmacological and Toxicological Screening Methods-I	10	15	1 Hr	25	75	3 Hrs	100	
MPL 104T	Cellular and Molecular Pharmacology	10	15	1 Hr	25	75	3 Hrs	100	
MPL 105P	Pharmacology Practical -I	20	30	6 Hrs	50	100	6 Hrs	150	
-	Seminar /Assignment*	-	-	-	100	-	-	100	
Total								650	
SEMESTER II									
MPL 201T	Advanced Pharmacology II	10	15	1 Hr	25	75	3 Hrs	100	
MPL 202T	Pharmacological and Toxicological Screening Methods –II	10	15	1 Hr	25	75	3 Hrs	100	
MPL 203T	Principles of Drug Discovery	10	15	1 Hr	25	75	3 Hrs	100	
MPL 204T	Clinical research and Pharmacovigilance	10	15	1 Hr	25	75	3 Hrs	100	
MPL 205P	Pharmacology Practical -II	20	30	6 Hrs	50	100	6 Hrs	150	
-	Seminar /Assignment*	-	-	-	100	-	-	100	
Total								650	
*In the case of "Seminar/Assignment" of Semester I and II, the total marks is split up as 25 marks each for the 4 theory courses, out of which 10 marks are awarded for seminars and 15 marks awarded for assignment, based on the syllabus of the respective theory course.									

Table – 7f: Schemes for internal assessments and end semester examination

MPP		PHARMACY PRACTICE						
Course code	Course	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration	
			Marks	Duration				
SEMESTER I								
MPP101T	Clinical Pharmacy Practice	10	15	1 Hr	25	75	3 Hrs	100
MPP102T	Pharmacotherapeutics-I	10	15	1 Hr	25	75	3 Hrs	100
MPP103T	Hospital &Community Pharmacy	10	15	1 Hr	25	75	3 Hrs	100
MPP104T	Clinical Research	10	15	1 Hr	25	75	3 Hrs	100
MPP105P	Pharmacy Practice Practical I	20	30	6 Hrs	50	100	6 Hrs	150
-	Seminar /Assignment*	-	-	-	100	-	-	100
Total								650
SEMESTER II								
MPP201T	Principles of Quality use of Medicines	10	15	1 Hr	25	75	3 Hrs	100
MPP202T	Pharmacotherapeutics II	10	15	1 Hr	25	75	3 Hrs	100
MPP203T	Clinical Pharmacokinetics and Therapeutic Drug Monitoring	10	15	1 Hr	25	75	3 Hrs	100
MPP204T	Pharmacoepidemiology & Pharmacoeconomics	10	15	1 Hr	25	75	3 Hrs	100
MPP205P	Pharmacy Practice Practical II	20	30	6 Hrs	50	100	6 Hrs	150
-	Seminar /Assignment*	-	-	-	100	-	-	100
Total								650
*In the case of "Seminar/Assignment" of Semester I and II, the total marks is split up as 25 marks each for the 4 theory courses, out of which 10 marks are awarded for seminars and 15 marks awarded for assignment, based on the syllabus of the respective theory course.								

Table – 8: Schemes for internal assessments and end semester examinations (Semester III& IV)

COMMON FOR ALL SPECIALISATIONS								
Coursecode	Course	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration	
			Marks	Duration				
SEMESTER III								
MRM 301T	Research Methodology and Biostatistics	10	15	1 Hr	25	75	3 Hrs	100
-	Journal Club	-	-	-	25	-	-	25
-	Discussion / Presentation (proposal presentation)	-	-	-	25	-	-	25
-	Research Work	-	-	-	-	350	1 Hr	350
Total						<i>Scheme</i>		500
SEMESTER IV								
-	Journal Club	-	-	-	25	-	-	25
-	Presubmission Discussion / Presentation	-	-	-	75	-	-	75
-	Research Work and Colloquium	-	-	-	-	400	1 Hr	400
Total								500

Table – 9: Scheme for awarding internal assessment

Criteria	Maximum Marks
Theory	
Attendance (Refer Table – 10)	8
Student – Teacher interaction	2
Total	10
Practical	
Attendance (Refer Table – 10)	10
Based on Practical Records, Regular viva voce, etc.	10
Total	20

Table – 10: Guidelines for the allotment of marks for attendance

Percentage of Attendance	Theory	Practical
95 – 100	8	10
90 – 94	6	7.5
85 – 89	4	5
80 – 84	2	2.5
Less than 80	0	0

Allowed to keep terms (ATKT):

No student shall be admitted to any examination unless he/she fulfills the norms given in clause 3.1. ATKT rules are applicable as follows:

A student shall be eligible to carry forward all the courses of I, II and III semesters till the IV semester examinations. However, he/she shall not be eligible to submit the project work (thesis) until all the courses of I, II, III and IV semesters are successfully completed.

A student shall be eligible to get his/her CGPA upon successful completion of the courses of I to IV semesters within the stipulated time period as per the norms. If the candidate does not fulfill any one of the pass criteria and at the same time secure aggregate of 50% or above (Sessional and End semester theory and practical), the candidate will fail and hence the letter grade shall be "F" and Grade point shall be "0".

The Semester Grade Point Average (SGPA) of a semester shall be awarded only to those candidates who pass all papers in that semester. The Cumulative Grade point Average (CGPA) shall be awarded only to those candidates who pass the entire course.

Note: Grade AB should be considered as failed and treated as one head for deciding ATKT. Such rules are also applicable for those students who fail to register for examination(s) of any course in any semester.

Grading of performances

a) Letter grades and grade points allocations:

Based on the performances, each student shall be awarded a final letter grade at the end of the semester for each course. The letter grades and their corresponding grade points are given in Table – 11.

Table – 11: Letter grades and grade points equivalent to Percentage of marks and performances

Percentage of Marks obtained	Letter Grade	Grade point	Performance
90.00 – 100	O	10	Outstanding
80.00 – 89.99	A	9	Excellent
70.00 – 79.99	B	8	Good
60.00 – 69.99	C	7	Fair
50.00 – 59.99	D	6	Average

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

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
	Total hours	16	18	6=(40)

* 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
	Total hours	17	9	6=(32)



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)

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.

- (i) Six months in General Medicine department, and
- (ii) 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.

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the
Kerala University of Health Sciences

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

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
	Total hours	18	15	7=(40)

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	-
	Total hours	8	20	4=(32)

*Attending ward rounds on daily basis.

Third Year:

Internship or residency training including postings in specialty 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 pharmacoconomics;
- (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).

(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

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	-	-	-
Total				700			500

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
Total				300			200

*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



- 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 ($3 \times 10 = 30$) and eight short notes each carrying 5 marks ($8 \times 5 = 40$)
- 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 allotted medical cases followed by discussion.
Students' capabilities in delivering clinical pharmacy services, pharmaceutical care planning and knowledge of therapeutics shall be assessed.

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(P.B) 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(P.B) 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 inter professional 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.
- 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

Third 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

SYLLABUS

**for Courses affiliated to the
Kerala University of Health Sciences
Thrissur 680596**



**POST GRADUATE COURSE IN
PHARMACEUTICAL CHEMISTRY**

Course Code: 277

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

Master of Pharmacy in Pharmaceutical Chemistry

2.2 Objectives of course

To generate Pharmacy Post Graduates with profound knowledge in various branches of Pharmaceutical Sciences to meet with the rapidly increasing demands, put forward by-

- Pharmaceutical Manufacturing
- Pharmaceutical Research & Development
- Pharmacological research including preclinical & clinical studies.
- Herbal Drug Research
- Pharmaceutical & Herbal Drug Analysis
- Clinical Toxicology & Toxicological Analysis

To discover the potential to become faculty in Pharmaceutical Sciences with unmatched quality and excellence, so as to educate the future pharmacy generation (Undergraduate, Postgraduate, and Doctoral).

2.3 Medium of instruction:

Medium of instruction shall be in English.

2.4 Course outline

a) M.Pharm Part – I course of study consists of two subjects namely one compulsory and one optional

course of study for each branch have been divided into one compulsory subject and three specialization subjects. The compulsory subject consist of two subjects papers – a theory paper and a practical paper.

The specialization subject consists of three theory paper (Paper I, Paper II, Paper III) with one practical paper for each respective theory paper.

b) M.Pharm Part – II course of study consists of a thesis written on the basis of regular research work during the second year by the candidate. A certificate by the supervising teacher (guide) stating that the candidate has worked under him/her during the M.Pharm Part – II course and has satisfactorily conducted the two seminars during the period shall be attached along with the thesis. Certificate from the college, if any, is also necessary.

The candidate shall be eligible to submit their thesis only after passing M.Pharm Part – I examination.

All M.Pharm Part –II students have to present two seminars relevant to their subject specialization including recent advances before submission of thesis.

2.5 Duration

Duration of the course:

- a) The duration of the M.Pharm course shall be of two academic years full time with each academic year spread over a period of not less than 365 working days.
- b) The study of M. Pharm course shall be of annual system, which includes M.Pharm (Part-I) extending for 12 months from the commencement of the academic term and M.Pharm (Part-II) of another 12 months duration.
- c) At the end of M.Pharm (Part-I) there shall be a university examination of M.Pharm (Part-I). At the end of M.Pharm (Part-II) the candidate shall submit a dissertation on the topic approved by the university.

2.6 Syllabus

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

2.8 Branches if any, with definition:

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

2.9 Teaching-Learning method:

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

2.10 Content of each subject in each year

SYLLABUS

**for Courses affiliated to the
Kerala University of Health Sciences
Thrissur 680596**



**POST GRADUATE COURSE IN
PHARMACOLOGY**

Course Code: 280

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

Master of Pharmacy in Pharmacology

2.2 Objectives of course

To generate Pharmacy Post Graduates with profound knowledge in various branches of Pharmaceutical Sciences to meet with the rapidly increasing demands put forward by-

- Pharmaceutical Manufacturing
- Pharmaceutical Research & Development
- Pharmacological research including preclinical & clinical studies
- Herbal Drug Research
- Pharmaceutical & Herbal Drug Analysis
- Clinical Toxicology & Toxicological Analysis

To discover the potential to become faculty in Pharmaceutical Science with unmatched quality and excellence, so as to educate the future generation (Undergraduate, Postgraduate, and Doctoral).

2.3 Medium of instruction:

Medium of instruction shall be in English.

2.4 Course outline

a) M.Pharm Part – I course of study consists of two subjects namely the compulsory and *one optional*

course of study for each branch have been divided into one compulsory subject and *three specialization* subjects. The *compulsory subject* consist of two subjects namely – a theory paper and a practical paper.

The *specialization subject* consists of three theory paper (Paper I, Paper II, Paper III) with one practical paper for each respective theory paper.

b) M.Pharm Part – II course of study consists of a thesis written on the basis of original research work during the second year by the candidate. A certificate by the supervising teacher (guide) stating that the candidate has worked under his/her during the M.Pharm Part – II course and has satisfactorily completed the two semesters during the period shall be attached along with the thesis. Certificate from the co-guide, if any, is also necessary.

The candidate shall be eligible to submit their thesis only after passing M.Pharm Part – II examination.

All M.Pharm Part –II students have to present two seminars relevant to their subject specialization including recent advances before submission of thesis.

2.5 Duration

Duration of the course:

- a) The duration of the M.Pharm course shall be of two academic years full time with each academic year spread over a period of not less than 365 working days.
- b) The study of M. Pharm course shall be of annual system, which includes M.Pharm (Part-I) extending for 12 months from the commencement of the academic term and M.Pharm (Part-II) of another 12 months duration.
- c) At the end of M.Pharm (Part-I) there shall be a university examination of M.Pharm (Part-I). At the end of M.Pharm (Part-II) the candidate shall submit a dissertation on the topic approved by the university.

2.6 Syllabus

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

2.8 Branches if any, with definition:

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

2.9 Teaching-Learning method:

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

2.10 Content of each subject in each year

SYLLABUS

for Courses affiliated to the
Kerala University of Health Sciences
Thrissur 680595



**POST GRADUATE COURSE IN
PHARMACY PRACTICE**

Course Code:281

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

Master of Pharmacy in Pharmacy Practice

2.2 Objectives of course

To generate Pharmacy Post Graduates with profound knowledge in various branches of Pharmaceutical Sciences to meet with the rapidly increasing demands put forward by:

- Pharmaceutical Manufacturing
- Pharmaceutical Research & Development
- Pharmacological research including preclinical & clinical studies.
- Herbal Drug Research
- Pharmaceutical & Herbal Drug Analysis
- Clinical Toxicology & Toxicological Analysis

To discover the potential to become faculty in Pharmaceutical Sciences with unmatched quality and excellence, so as to educate the future pharmacy generation (Undergraduate, Postgraduate, and Doctoral).

2.3 Medium of instruction:

Medium of instruction shall be in English

2.4 Course outline

a) M.Pharm Part – I course of study consists of two subjects namely one compulsory and one optional

course of study for each branch have been divided into one compulsory subject and three specialization subjects. The compulsory subject consist of two subjects papers – a theory paper and a practical paper.

The specialization subject consists of three theory paper (Paper I, Paper II, Paper III) with one practical paper for each respective theory paper.

b) M.Pharm Part – II course of study consists of a thesis written on the basis of regular research work during the second year by the candidate. A certificate by the supervising teacher (guide) stating that the candidate has worked under him/her during the M.Pharm Part – II course and has satisfactorily conducted the two seminars during the period shall be attached along with the thesis. Certificate from the co-guide, if any, is also necessary.

The candidate shall be eligible to submit their thesis only after passing M.Pharm Part – I examination. Students of Pharmacy Practice have to undergo clerkship programme in various clinical departments during the first 3 months of M.Pharm Part – II.

All M.Pharm Part –II students have to present two seminars relevant to their subject specialization including recent advances before submission of thesis.

2.5 Duration

Duration of the course:

- a) The duration of the M.Pharm course shall be of two academic years full time with each academic year spread over a period of not less than 365 working days.
- b) The study of M. Pharm course shall be of annual system, which includes M.Pharm (Part-I) extending for 12 months from the commencement of the academic term and M.Pharm (Part-II) of another 12 months duration.
- c) At the end of M.Pharm (Part-I) there shall be a university examination of M.Pharm (Part-I). At the end of M.Pharm (Part-II) the candidate shall submit a dissertation on the topic approved by the university.

2.6 Syllabus

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

2.8 Branches if any, with definition:

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

2.9 Teaching-Learning method:

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

2.10 Content of each subject in each year

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

REGULATIONS 2016

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

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