

“KAR BHALA HOGA BHALA”



KADI SARVA VISHWAVIDYALAYA, GANDHINAGAR

(Established vide Gujarat State Government Act 21 of 2007 and approved by UGC (ref F.9-18/2008(cpp-1) March 19, 2009)

ACADEMIC REGULATIONS & SYLLABUS

BACHELOR OF PHARMACY

EFFECTIVE FROM JUNE-2017



K. B. INSTITUTE OF PHARMACEUTICAL EDUCATION & RESEARCH

GH-6, SECTOR-23, KADI CAMPUS, GANDHINAGAR-382023.

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PRINCIPAL

H.O.D.

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K. B. INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH
BACHELOR OF PHARMACY SYLLABUS
Effective from Session JUNE 2017

INDEX

Sr No	Title	Page No
1	ACADEMIC REGULATION	1-9
2	SCHEME OF TEACHING	10-17
	SEMESTER – I	10
	SEMESTER – II	11
	SEMESTER – III	12
	SEMESTER – IV	13
	SEMESTER – V	14
	SEMESTER – VI	15
	SEMESTER – VII	16
	SEMESTER –VIII	17
3	SCHEME OF EXAMINATION	18-25
	SEMESTER – I	18
	SEMESTER – II	19
	SEMESTER – III	20
	SEMESTER – IV	21
	SEMESTER – V	22
	SEMESTER – VI	23
	SEMESTER – VII	24
	SEMESTER –VIII	25
4	SYLLABUS MPHARM SEM – I	28 - 48
	BP101T Human Anatomy and Physiology I– Theory	28
	BP102T Pharmaceutical Analysis I – Theory	31
	BP103T Pharmaceutics I – Theory	34
	BP104T Pharmaceutical Inorganic Chemistry – Theory	38
	BP105T Communication skills – Theory *	41
	BP106RMT Remedial Mathematics – Theory*	44
	BP106RBT Remedial Biology	46
	BP107P Human Anatomy and Physiology – Practical	30
	BP108P Pharmaceutical Analysis I – Practical	33
	BP109P Pharmaceutics I – Practical	36
	BP110P Pharmaceutical Inorganic Chemistry – Practical	40
	BP111P Communication skills – Practical*	43
	BP112RBP Remedial Biology – Practical*	48
5	PAPER STYLE	49

KADI SARVA VISHWAVIDYALAYA
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ACADEMIC REGULATION
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Short Title and Commencement

These regulations shall be called as “The Revised Regulations for the B. Pharm. Degree Program (CBCS) of the Pharmacy Council of India, New Delhi”. They shall come into effect from the Academic Year 2016-17. The regulations framed are subject to modifications from time to time by Pharmacy Council of India.

Minimum qualification for admission

• First year B. Pharm:

Candidate shall have passed 10+2 examination conducted by the respective state/central government authorities recognized as equivalent to 10+2 examination by the Association of Indian Universities (AIU) with English as one of the subjects and Physics, Chemistry, Mathematics (P.C.M) and or Biology (P.C.B/P.C.M.B.) as optional subjects individually. Any other qualification approved by the Pharmacy Council of India as equivalent to any of the above examinations.

• B. Pharm lateral entry (to third semester):

A pass in D. Pharm. course from an institution approved by the Pharmacy Council of India under section 12 of the Pharmacy Act.

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.

Medium of instruction and examinations

Medium of instruction and examination shall be in English.

Working days in each semester

Each semester shall consist of not less than 100 working days. The odd semesters shall be conducted from the month of June/July to November/December and the even semesters shall be conducted from December/January to May/June in every calendar year.

Attendance and progress

A candidate is required to put in at least 80% attendance in individual courses considering theory and practical separately. The candidate shall complete the prescribed course satisfactorily to be eligible to appear for the respective examinations.

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.

CREDIT ASSIGNMENT

Theory and Laboratory courses

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.

Minimum credit requirements

The minimum credit points required for award of a B. Pharm. degree is 208.

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 1. 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.

TABLE 1: SEMESTER WISE CREDITS DISTRIBUTION

Table-IX: Semester wise credits distribution Semester	Credit Points
I	27/29 [§] /30 [#]
II	29
III	26
IV	28
V	26
VI	26
VII	24
VIII	22
Extracurricular/ Co-curricular activities	01 [*]
Total credit points for the program	209/211[§]/212[#]

*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.

[§]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

EXAMINATIONS

Each examination has two components:

Internal Evaluation, which is done at the Institute level; and **Semester-End examination**, conducted by the Kadi Sarva Vishwavidyalaya. Semester-End examination is also referred to as University Examination or External Examination in the following sections. The internal evaluation and University examination will have a ratio of 25:75.

Internal evaluation will be carried out in two components: **Continuous Evaluation** and **Sessional** or Internal examination. The marks allocated for Continuous mode of Internal Assessment shall be awarded as per the scheme given below.

TABLE 2: SCHEME FOR AWARDED INTERNAL ASSESSMENT: CONTINUOUS MODE

Theory		
Criteria	Maximum Marks	
	For [25]	For [15]
Attendance (Table 3)	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 (Table 3)	2	
Based on Practical Records, Regular viva voce, etc.	3	
Total	5	

TABLE 3: 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

TABLE 4: MARKING SYSTEMS

MODE OF EXAMINATION	CONTINUOUS MODE	SESSIONAL				TOTAL	EXTERNAL EXAM	TOTAL
		1 st	2 nd	Avg.	Computed Marks	INTERNAL		
Theory	10	30	30	30	15	25	75	100
Practical/LPW	5	40	40	40	10	15	35	50

For practicals, the continuous evaluation will be carried out in form of evaluation of each individual LPW (laboratory practical work) exercise, which may consist of oral examination or *viva voce*, written evaluation like quiz or synopsis, performance of the student in the laboratory, etc. The average marks out of 10 will be calculated for the purpose.

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 Scheme of examination.

Sessional exam shall be conducted for 30 marks for theory and shall be computed for 15 marks. Similarly, Sessional exam for practical shall be conducted for 40 marks and shall be computed for 10 marks.

TABLE 5: SCHEME OF EXAMINATION:

	Internal Evaluation			University examination	Total
	Continuous evaluation	Internal Examination	Total		
Theory	10	15	25	75	100
Practical/LPW	5	10	15	35	50

Assessment:

For assessment, theory and LPW will be considered as separate subject heads. To pass a course, the candidates will have to pass in all examinations of all subject heads of that course. The method of assessment will be as follows:

In all assessment the overall percentage marks, if fractional will be rounded off to the next higher integer value.

Internal Evaluation:

The student must get at least 50% marks in internal evaluation (i.e. 12.5 out of 25 and 7.5 out of 15) in each subject head (i.e. separately in theory and LPW respectively). An Improvement Sessional Examination will be conducted before semester end examination. The eligibility criteria for the same will be:

- The students who have scored < 50% marks in internal evaluation, and/or
- The students who fail to appear for the sessional examination for the verifiable reasons acceptable to the Academic Committee of the Institute; this decision will be taken on a case-to-case basis.
- The syllabus for improvement sessional examination will be decided by Academic Committee of the Institute.

Improvement of Internal assessment

A student shall have the opportunity to improve his/her performance only once in the Sessional exam component of the internal assessment. The re-conduct of the Sessional exam shall be completed before the commencement of next end semester theory examinations.

The maximum total internal marks (marks obtained in the internal evaluation) of the students appearing for Improvement Sessional Examination shall be considered as actual or 50% (5 out of 10), whichever is lower; in the respective subject head.

Semester-End Examination:

The student must get at least 50% marks in the semester-end examination (i.e. 37.5 out of 75 and 17.5 out of 35) in each subject head (i.e. separately in theory and LPW respectively). In order to pass an examination, the student must pass in all the subject heads. In order to pass in a subject head, a student must obtain:

- (a) At least 50% marks in Internal Evaluation (i.e. 12 out of 25), **AND**
- (b) At least 50% marks in semester-end examination (i.e. 37 out of 75), **AND**
- (c) At least 50% marks aggregate of internal evaluation and semester-end examination (i.e. 50 out of 100)

If one or more of the above criteria are not satisfied, the student shall be declared “Fail” in the respective subject head. If a student fails in one or more subject head, she/he will be declared “Fail” in the respective examination. If the student passes in the internal evaluation, but fails in the semester-end examination, she/he will be required to reappear for the semester-end examination of the respective subject/s. If the student fails in internal evaluation, or in both, the internal evaluation and semester-end examination; she/he will be required to reappear for both the internal evaluation **and** semester-end examination of the respective subject/s. The student will be allowed to keep the terms for the next semester subject to fulfillment of requirements for Granting of Term.

Granting the term:

Academic Progression: Academic progression rules are applicable as follows:

- A candidate is required to put in at least 80% attendance in individual courses considering theory and practical separately. The candidate shall complete the prescribed course satisfactorily to be eligible to appear for the respective examinations.
- 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 attend the courses of V semester until all the courses of I and II semesters are successfully completed.
- A student shall be eligible to carry forward all the courses of III, IV and V semesters till the VI semester examinations. However, he/she shall not be eligible to attend the courses of VII semester until all the courses of I, II, III and IV semesters are successfully completed.
- A student shall be eligible to carry forward all the courses of V, VI and VII semesters till the VIII semester examinations. However, he/she shall not be eligible to get the course completion certificate until all the courses of I, II, III, IV, V and VI semesters are successfully completed.
- A student shall be eligible to get his/her CGPA upon successful completion of the courses of I to VIII semesters within the stipulated time period as per the norms specified in 26.
- A lateral entry student shall be eligible to carry forward all the courses of III, IV and V semesters till the VI semester examinations. However, he/she shall not be eligible to attend the courses of VII semester until all the courses of III and IV semesters are successfully completed.
- A lateral entry student shall be eligible to carry forward all the courses of V, VI and VII semesters till the VIII semester examinations. However, he/she shall not be eligible to get the course completion certificate until all the courses of III, IV, V and VI semesters are successfully completed.
- A lateral entry student shall be eligible to get his/her CGPA upon successful completion of the courses of III to VIII semesters within the stipulated time period as per the norms.
- Any student who has given more than 4 chances for successful completion of I / III semester courses and more than 3 chances for successful completion of II / IV semester courses shall be permitted to attend V / VII semester classes ONLY during the subsequent academic year as the case may be. In simpler terms there shall NOT be any ODD BATCH for any semester.

TABLE 6: SEMESTER-WISE CONDITIONS:

Sr.	SEMESTER	Condition	Inference	Action
1	Semester-I	Regularity & Term work completion	Allowed to appear in Sem-I examination	
2	Semester-II	Regularity and term work completion in Sem-II, Sem-I is not cleared.	Allowed to appear in Sem-II examination	Have to appear in Sem-I remedial exam
3	Semester-III	Regularity and term work completion Sem-I has to be cleared	Allowed to attend Sem-III	
4	Similarly the sequence will be followed in consequent semesters.			

The aggregate of CGPA of Semesters 3 to 8 will be considered for awarding the class.

In case of change in syllabus by the University, the student will be allowed one additional attempt to pass the examination of the semester in question. If she/he still fails to pass the examination, she/he will be required to re-enroll for the course.

GRADE AND CREDIT SYSTEM

SUBJECT CREDITS:

- Each subject offered is either theory or practical (including term work) or tutorials.
- Credits for each subject are mentioned in course structure.
- The overall performance of students in a course is represented by letter grades with following meanings and equivalent grade points:

Table 7: Grade Points scale

Letter Grade	Quantitative (Meaning)	Equivalent grade point
A++	90-100%	10
A+	80-89%	9
A	70-79%	8
B+	60-69%	7
B	50-59%	6
F	>50%	0

A learner who remains absent for any end semester examination shall be assigned a letter grade of AB and a corresponding grade point of zero. He/she should reappear for the said evaluation/examination in due course.

The Semester grade point average (SGPA)

The performance of a student in a semester is indicated by a number called ‘Semester Grade Point Average’ (SGPA). The SGPA is the weighted average of the grade points obtained in all the courses by the student during the semester. For example, if a student takes five courses(Theory/Practical) in a semester with credits C₁, C₂, C₃, C₄ and C₅ and the student’s grade points in these courses are G₁, G₂, G₃, G₄ and G₅, respectively, and then students’ SGPA is equal to:

$$\text{SGPA} = \frac{C_1G_1 + C_2G_2 + C_3G_3 + C_4G_4 + C_5G_5}{C_1 + C_2 + C_3 + C_4 + C_5}$$

The SGPA is calculated to two decimal points. It should be noted that, the SGPA for any semester shall take into consideration the F and ABS grade awarded in that semester. For example, if a learner has a F or ABS grade in course 4, the SGPA shall then be computed as:

$$\text{SGPA} = \frac{C_1G_1 + C_2G_2 + C_3G_3 + C_4 * \text{ZERO} + C_5G_5}{C_1 + C_2 + C_3 + C_4 + C_5}$$

Cumulative Grade Point Average (CGPA)

The CGPA is calculated with the SGPA of all the VIII semesters to two decimal points and is indicated in final grade report card/final transcript showing the grades of all VIII semesters and their courses. The CGPA shall reflect the failed status in case of F grade(s), till the course(s) is/are passed. When the course(s) is/are passed by obtaining a pass grade on subsequent examination(s) the CGPA shall only reflect the new grade and not the fail grades earned earlier. The CGPA is calculated as:

$$\text{CGPA} = \frac{C_1S_1 + C_2S_2 + C_3S_3 + C_4S_4 + C_5S_5 + C_6S_6 + C_7S_7 + C_8S_8}{C_1 + C_2 + C_3 + C_4 + C_5 + C_6 + C_7 + C_8}$$

where C1, C2, C3....., is the total number of credits for semester I, II, III.... and S1, S2, S3.....is the SGPA of semester I, II, III.....,

Declaration of class: The class shall be awarded based on CGPA as follows:

First Class with Distinction	=	CGPA of. 7.50 & Above
First Class	=	CGPA of 6.00 to 7.49
Second Class	=	CGPA of 5.00 to 5.99

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.

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.

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.

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.

Award of degree

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

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.

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.

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Effective from Session JUNE 2017
SEMESTER-I
SCHEME OF TEACHING

SUB CODE	NAME OF SUBJECT	CONTACT HOURS PER WEEK		TUTORIAL	CREDIT	
		T	P		T	P
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/	2	-	-	2	-
BP106RMT	Remedial Mathematics – Theory*			-		
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)

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 Effective from Session JUNE 2017
SEMESTER-II
SCHEME OF TEACHING

SUB CODE	NAME OF SUBJECT	CONTACT HOURS PER WEEK		TUTORIAL	CREDIT	
		T	P		T	P
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)

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Effective from Session JUNE 2017
SEMESTER-III
SCHEME OF TEACHING

SUB CODE	NAME OF SUBJECT	CONTACT HOURS PER WEEK		TUTORIAL	CREDIT	
		T	P		T	P
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
BP308P	Pharmaceutical Engineering – Practical	-	4	-	-	2
Total		28		4	29	

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BACHELOR OF PHARMACY SYLLABUS
Effective from Session JUNE 2017
SEMESTER-IV
SCHEME OF TEACHING

SUB CODE	NAME OF SUBJECT	CONTACT HOURS PER WEEK		TUTORIAL	CREDIT	
		T	P		T	P
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	

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K. B. INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH
BACHELOR OF PHARMACY SYLLABUS
Effective from Session JUNE 2017
SEMESTER-V
SCHEME OF TEACHING

SUB CODE	NAME OF SUBJECT	CONTACT HOURS PER WEEK		TUTORIAL	CREDIT	
		T	P		T	P
BP501T	Medicinal Chemistry II – Theory	3	-	1	4	-
BP502T	Industrial Pharmacy I– 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	Industrial Pharmacy I – Practical	-	4	-	-	2
BP507P	Pharmacology II – Practical	-	4	-	-	2
BP508P	Pharmacognosy and Phytochemistry II – Practical	-	4	-	-	2
Total		27		5	26	

KADI SARVA VISHWAVIDYALAYA
K. B. INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH
BACHELOR OF PHARMACY SYLLABUS
Effective from Session JUNE 2017
SEMESTER-VI
SCHEME OF TEACHING

SUB CODE	NAME OF SUBJECT	CONTACT HOURS PER WEEK		TUTORIAL	CREDIT	
		T	P		T	P
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	

KADI SARVA VISHWAVIDYALAYA
K. B. INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH
BACHELOR OF PHARMACY SYLLABUS
 Effective from Session JUNE 2017
SEMESTER-VII
SCHEME OF TEACHING

SUB CODE	NAME OF SUBJECT	CONTACT HOURS PER WEEK		TUTORIAL	CREDIT	
		T	P		T	P
BP701T	Instrumental Methods of Analysis – Theory	3	-	1	4	-
BP702T	Industrial Pharmacy II – 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		5	24	

* Non-University Examination (NUE)

**KADI SARVA VISHWAVIDYALAYA
K. B. INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH
BACHELOR OF PHARMACY SYLLABUS
Effective from Session JUNE 2017
SEMESTER-VIII
SCHEME OF TEACHING**

SUB CODE	NAME OF SUBJECT	CONTACT HOURS PER WEEK		TUTORIAL	CREDIT	
		T	P		T	P
BP801T	Biostatistics and Research Methodology	3	-	1	4	-
BP802T	Social and Preventive Pharmacy	3	-	1	4	-
BP803ET	Pharma Marketing Management	3+3	-	1+1	4+4	-
BP804ET	Pharmaceutical Regulatory Science		-			-
BP805ET	Pharmacovigilance		-			-
BP806ET	Quality Control and Standardization of		-			-
BP807ET	Computer Aided Drug Design		-			-
BP808ET	Cell and Molecular Biology		-			-
BP809ET	Cosmetic Science		-			-
BP810ET	Experimental Pharmacology		-			-
BP811ET	Advanced Instrumentation Techniques		-			-
BP812ET	Dietary Supplements and Nutraceuticals		-			-
BP813PW	Project Work	-	12	-	-	6
Total		24		4	22	

KADI SARVA VISHWA VIDYALAYA
K. B. INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH
BACHELOR OF PHARMACY SYLLABUS
Effective from Session JUNE 2017
SEMESTER-I
SCHEME OF EXAMINATION

SUB CODE	NAME OF SUBJECT	DURATION OF EXAM (HRS)		MARKS				TOTAL MARKS
				Institute level evaluation		University level evaluation		
		T	P	T	P	T	P	
BP101T	Human Anatomy and Physiology I– Theory	3	--	25	--	75	--	100
BP102T	Pharmaceutical Analysis I – Theory	3	--	25	--	75	--	100
BP103T	Pharmaceutics I – Theory	3	--	25	--	75	--	100
BP104T	Pharmaceutical Inorganic Chemistry – Theory	3	--	25	--	75	--	100
BP105T	Communication skills – Theory *	1.5	--	15	--	35	--	50
BP106RBT BP106RMT	Remedial Biology/ Mathematics – Theory*	1.5	--	15	--	35	--	50
BP107P	Human Anatomy and Physiology – Practical	--	4	--	15	--	35	50
BP108P	Pharmaceutical Analysis I – Practical	--	4	--	15	--	35	50
BP109P	Pharmaceutics I – Practical	--	4	--	15	--	35	50
BP110P	Pharmaceutical Inorganic Chemistry – Practical	--	4	--	15	--	35	50
BP111P	Communication skills – Practical*	--	2	--	10	--	15	25
BP112RBP	Remedial Biology – Practical*	--	2	--	10	--	15	25
Total		31.5/33 ^{\$} /35 [#]		185/200 ^{\$} /210		490/525 ^{\$} /540 [#]		675/725 ^{\$} /750 [#]

#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)

**KADI SARVA VISHWAVIDYALAYA
K. B. INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH
BACHELOR OF PHARMACY SYLLABUS
Effective from Session JUNE 2017
SEMESTER-II
SCHEME OF EXAMINATION**

SUB CODE	NAME OF SUBJECT	DURATION OF EXAM (HRS)		MARKS				TOTAL MARKS
				Institute level evaluation		University level evaluation		
		T	P	T	P	T	P	
BP201T	Human Anatomy and Physiology II – Theory	3	--	25	--	75	--	100
BP202T	Pharmaceutical Organic Chemistry I – Theory	3	--	25	--	75	--	100
BP203T	Biochemistry – Theory	3	--	25	--	75	--	100
BP204T	Pathophysiology – Theory	3	--	25	--	75	--	100
BP205T	Computer Applications in Pharmacy – Theory *	2	--	25	--	50	--	75
BP206T	Environmental sciences – Theory *	2	--	25	--	50	--	75
BP207P	Human Anatomy and Physiology II –Practical	--	4	--	15	--	35	50
BP208P	Pharmaceutical Organic Chemistry I– Practical	--	4	--	15	--	35	50
BP209P	Biochemistry – Practical	--	4	--	15	--	35	50
BP210P	Computer Applications in Pharmacy – Practical*	--	2	--	10	--	15	25
Total		30		205		520		725

*Non-University Examination (NUE)

KADI SARVA VISHWA VIDYALAYA
K. B. INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH
BACHELOR OF PHARMACY SYLLABUS
Effective from Session JUNE 2017
SEMESTER-III
SCHEME OF EXAMINATION

SUB CODE	NAME OF SUBJECT	DURATION OF EXAM (HRS)		MARKS				TOTAL MARKS
				Institute level evaluation		University level evaluation		
		T	P	T	P	T	P	
BP301T	Pharmaceutical Organic Chemistry II – Theory	3	--	25	--	75	--	100
BP302T	Physical Pharmaceutics I – Theory	3	--	25	--	75	--	100
BP303T	Pharmaceutical Microbiology – Theory	3	--	25	--	75	--	100
BP304T	Pharmaceutical Engineering – Theory	3	--	25	--	75	--	100
BP305P	Pharmaceutical Organic Chemistry II – Practical	--	4	--	15	--	35	50
BP306P	Physical Pharmaceutics I – Practical	--	4	--	15	--	35	50
BP307P	Pharmaceutical Microbiology – Practical	--	4	--	15	--	35	50
BP308P	Pharmaceutical Engineering – Practical	--	4	--	15	--	35	50
Total		28		160		440		600

KADI SARVA VISHWA VIDYALAYA
K. B. INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH
BACHELOR OF PHARMACY SYLLABUS
 Effective from Session JUNE 2017
SEMESTER-IV
SCHEME OF EXAMINATION

SUB CODE	NAME OF SUBJECT	DURATION OF EXAM (HRS)		MARKS				TOTAL MARKS
				Institute level evaluation		University level evaluation		
		T	P	T	P	T	P	
BP401T	Pharmaceutical Organic Chemistry III– Theory	3	--	25	--	75	--	100
BP402T	Medicinal Chemistry I– Theory	3	--	25	--	75	--	100
BP403T	Physical Pharmaceutics II – Theory	3	--	25	--	75	--	100
BP404T	Pharmacology I – Theory	3	--	25	--	75	--	100
BP405T	Pharmacognosy and Phytochemistry I– Theory	3	--	25	--	75	--	100
BP406P	Medicinal Chemistry I – Practical	--	4	--	15	--	35	50
BP407P	Physical Pharmaceutics II – Practical	--	4	--	15	--	35	50
BP408P	Pharmacology I – Practical	--	4	--	15	--	35	50
BP409P	Pharmacognosy and Phytochemistry I – Practical	--	4	--	15	--	35	50
Total		21		185		515		700

*Non-University Examination (NUE)

**KADI SARVA VISHWA VIDYALAYA
K. B. INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH
BACHELOR OF PHARMACY SYLLABUS
Effective from Session JUNE 2017
SEMESTER-V
SCHEME OF EXAMINATION**

SUB CODE	NAME OF SUBJECT	DURATION OF EXAM (HRS)		MARKS				TOTAL MARKS
				Institute level evaluation		University level evaluation		
				T	P	T	P	
BP501T	Medicinal Chemistry II – Theory	3	--	25	--	75	--	100
BP502T	Industrial Pharmacy I– Theory	3	--	25	--	75	--	100
BP503T	Pharmacology II – Theory	3	--	25	--	75	--	100
BP504T	Pharmacognosy and Phytochemistry II– Theory	3	--	25	--	75	--	100
BP505T	Pharmaceutical Jurisprudence – Theory	2	--	25	--	75	--	100
BP506P	Industrial Pharmacy I – Practical	--	4	--	15	--	35	50
BP507P	Pharmacology II – Practical	--	4	--	15	--	35	50
BP508P	Pharmacognosy and Phytochemistry II – Practical	--	4	--	15	--	35	50
Total		27		170		480		650

KADI SARVA VISHWAVIDYALAYA
K. B. INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH
BACHELOR OF PHARMACY SYLLABUS
 Effective from Session JUNE 2017
SEMESTER-VI
SCHEME OF EXAMINATION

SUB CODE	NAME OF SUBJECT	DURATION OF EXAM (HRS)		MARKS				TOTAL MARKS
				Institute level evaluation		University level evaluation		
		T	P	T	P	T	P	
BP601T	Medicinal Chemistry III – Theory	3	--	25	--	75	--	100
BP602T	Pharmacology III – Theory	3	--	25	--	75	--	100
BP603T	Herbal Drug Technology – Theory	3	--	25	--	75	--	100
BP604T	Biopharmaceutics and Pharmacokinetics –	3	--	25	--	75	--	100
BP605T	Pharmaceutical Biotechnology – Theory	2	--	25	--	75	--	100
BP606T	Quality Assurance –Theory	2	--	25	--	75	--	100
BP607P	Medicinal chemistry III – Practical	--	4	--	15	--	35	50
BP608P	Pharmacology III – Practical	--	4	--	15	--	35	50
BP609P	Herbal Drug Technology – Practical	--	4	--	15	--	35	50
Total		30		195		555		750

KADI SARVA VISHWAVIDYALAYA
K. B. INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH
BACHELOR OF PHARMACY SYLLABUS
 Effective from Session JUNE 2017
SEMESTER-VII
SCHEME OF EXAMINATION

SUB CODE	NAME OF SUBJECT	DURATION OF EXAM (HRS)		MARKS				TOTAL MARKS
				Institute level evaluation		University level evaluation		
		T	P	T	P	T	P	
BP701T	Instrumental Methods of Analysis – Theory	3	--	25	--	75	--	100
BP702T	Industrial Pharmacy II – Theory	3	--	25	--	75	--	100
BP703T	Pharmacy Practice – Theory	3	--	25	--	75	--	100
BP704T	Novel Drug Delivery System – Theory	3	--	25	--	75	--	100
BP705P	Instrumental Methods of Analysis – Practical	--	4	--	15	--	35	50
BP706PS	Practice School*	5	--	25	--	125	--	150
Total		21		140		460		550

* The subject experts at college level shall conduct examinations

KADI SARVA VISHWAVIDYALAYA
K. B. INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH
BACHELOR OF PHARMACY SYLLABUS
 Effective from Session JUNE 2017
SEMESTER-VIII
SCHEME OF EXAMINATION

SUB CODE	NAME OF SUBJECT	DURATION OF EXAM (HRS)		MARKS				TOTAL MARKS
				Institute level evaluation		University level evaluation		
		T	P	T	P	T	P	
BP801T	Biostatistics and Research Methodology	3	--	25	--	75	--	100
BP802T	Social and Preventive Pharmacy	3	--	25	--	75	--	100
BP803ET	Pharma Marketing Management	3+3	--	25+25	--	75+75	--	100+100
BP804ET	Pharmaceutical Regulatory Science		--		--			
BP805ET	Pharmacovigilance		--		--			
BP806ET	Quality Control and Standardization of		--		--			
BP807ET	Computer Aided Drug Design		--		--			
BP808ET	Cell and Molecular Biology		--		--			
BP809ET	Cosmetic Science		--		--			
BP810ET	Experimental Pharmacology		--		--			
BP811ET	Advanced Instrumentation Techniques		--		--			
BP812ET	Dietary Supplements and Nutraceuticals		--		--			
BP813PW	Project Work	--	4	--	--	--	150	150
Total		16		100		450		550

KADI SARVA VISHWA VIDYALAYA
K. B. INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH
BACHELOR OF PHARMACY SYLLABUS
Effective from Session JUNE 2017
SEMESTER-I
SCHEME OF TEACHING

SUB CODE	NAME OF SUBJECT	CONTACT HOURS PER WEEK		TUTORIAL	CREDIT	
		T	P		T	P
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/	2	-	-	2	-
BP106RMT	Remedial Mathematics - Theory*			-		
BP107P	Human Anatomy and Physiology I - 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)

KADI SARVA VISHWA VIDYALAYA
K. B. INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH
BACHELOR OF PHARMACY SYLLABUS
Effective from Session JUNE 2017
SEMESTER-I
SCHEME OF EXAMINATION

SUB CODE	NAME OF SUBJECT	DURATION OF EXAM (HRS)		MARKS				TOTAL MARKS
				Institute level evaluation		University level evaluation		
		T	P	T	P	T	P	
BP101T	Human Anatomy and Physiology I – Theory	3	--	25	--	75	--	100
BP102T	Pharmaceutical Analysis I – Theory	3	--	25	--	75	--	100
BP103T	Pharmaceutics I – Theory	3	--	25	--	75	--	100
BP104T	Pharmaceutical Inorganic Chemistry – Theory	3	--	25	--	75	--	100
BP105T	Communication Skills – Theory *	1.5	--	15	--	35	--	50
BP106RBT BP106RM	Remedial Biology/ Mathematics – Theory*	1.5	--	15	--	35	--	50
BP107P	Human Anatomy and Physiology I – Practical	--	4	--	15	--	35	50
BP108P	Pharmaceutical Analysis I – Practical	--	4	--	15	--	35	50
BP109P	Pharmaceutics I – Practical	--	4	--	15	--	35	50
BP110P	Pharmaceutical Inorganic Chemistry – Practical	--	4	--	15	--	35	50
BP111P	Communication Skills – Practical*	--	2	--	10	--	15	25
BP112RBP	Remedial Biology – Practical*	--	2	--	10	--	15	25
Total		31.5/33 [§] /35 [#]		185/200 [§] /210 [#]		490/525 [§] /540 [#]		675/725 [§]

[#]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)

SUBJECT : HUMAN ANATOMY AND PHYSIOLOGY - I THEORY
SUBJECT CODE : BP101T

SCOPE This subject is designed to impart fundamental knowledge on the structure and functions of the various systems of the human body. It also helps in understanding both homeostatic mechanisms. The subject provides the basic knowledge required to understand the various disciplines of pharmacy.

OBJECTIVES Upon completion of the course, student shall be able to understand:

- Explain the gross morphology, structure and functions of various organs of the human body.
- Describe the various homeostatic mechanisms and their imbalances.
- Identify the various tissues and organs of different systems of human body.
- Perform the various experiments related to special senses and nervous system.
- Appreciate coordinated working pattern of different organs of each system

LEARNING OUTCOMES: At the end of the course the student will be able to:

1. Draw and label the internal structure of cell, arrangement of tissues, important organs and body systems.
2. Narrate the functions of important organs and their sub-parts.
3. Provide the basis for physiological variations
4. Quantify the various components of blood and able to diagnose any abnormalities based on variations in the blood components.
5. Identify the important bones, body organs in the models.
6. Able to measure the radial pulse, Blood pressure and body temperature
7. Take ECG tracings and describe the significance of each wave.
8. Explain the cause, transmission, prevention and management of common communicable diseases.
9. Define various terminologies used in health.
10. Narrate various macro and micro-nutrients and provide their importance in maintenance of health.
11. Demonstrate the various first-aid techniques used in emergencies.
12. Narrate the various contraceptive methods, their merits and demerits.

PREREQUISITES: The student should have basic knowledge of biology, physics and chemistry of HSC level.

TEACHING AND EVALUATION SCHEME:

SUB CODE	TITLE OF SUBJECT	TEACHING SCHEME (HRS)			CREDITS	EVALUATION SCHEME				TOTAL MARKS
		T	P	TOTAL		INTERNAL		EXTERNAL		
						Theory	Practical	Theory	Practical	
BP101T	Human Anatomy and Physiology I - Theory	3	-	3	4	25	--	75	--	100

Course content:

CH.NO	PARTICULARS	45 HRS
1	<ul style="list-style-type: none"> • Introduction to human body Definition and scope of anatomy and physiology, levels of structural organization and body systems, basic life processes, homeostasis, basic anatomical terminology. • Cellular level of organization Structure and functions of cell, transport across cell membrane, cell division, cell junctions. General principles of cell communication, intracellular signaling pathway 	10

	<p>activation by extracellular signal molecule, Forms of intracellular signaling: a) Contact-dependent b) Paracrine c) Synaptic d) Endocrine</p> <ul style="list-style-type: none"> • Tissue level of organization <p>Classification of tissues, structure, location and functions of epithelial, muscular and nervous and connective tissues.</p>	
2	<ul style="list-style-type: none"> • Integumentary system <p>Structure and functions of skin</p> <ul style="list-style-type: none"> • Skeletal system <p>Divisions of skeletal system, types of bone, salient features and functions of bones of axial and appendicular skeletal system Organization of skeletal muscle, physiology of muscle contraction, neuromuscular junction</p> <ul style="list-style-type: none"> • Joints <p>Structural and functional classification, types of joints movements and its articulation</p>	10
3	<ul style="list-style-type: none"> • Body fluids and blood <p>Body fluids, composition and functions of blood, hemopoiesis, formation of hemoglobin, anemia, mechanisms of coagulation, blood grouping, Rh factors, transfusion, its significance and disorders of blood, Reticulo endothelial system.</p> <ul style="list-style-type: none"> • Lymphatic system <p>Lymphatic organs and tissues, lymphatic vessels, lymph circulation and functions of lymphatic system</p>	10
4	<ul style="list-style-type: none"> • Peripheral nervous system: <p>Classification of peripheral nervous system: Structure and functions of sympathetic and parasympathetic nervous system. Origin and functions of spinal and cranial nerves.</p> <ul style="list-style-type: none"> • Special senses <p>Structure and functions of eye, ear, nose and tongue and their disorders.</p>	8
5	<ul style="list-style-type: none"> • Cardiovascular system <p>Heart – anatomy of heart, blood circulation, blood vessels, structure and functions of artery, vein and capillaries, elements of conduction system of heart and heartbeat, its regulation by autonomic nervous system, cardiac output, cardiac cycle. Regulation of blood pressure, pulse, electrocardiogram and disorders of heart.</p>	7

SUBJECT : HUMAN ANATOMY AND PHYSIOLOGY I – PRACTICAL

SUBJECT CODE : BP107P

Practical physiology is complimentary to the theoretical discussions in physiology. Practicals allow the verification of physiological processes discussed in theory classes through experiments on living tissue, intact animals or normal human beings. This is helpful for developing an insight on the subject.

SUB CODE	TITLE OF SUBJECT	TEACHING SCHEME (HRS)			CREDITS	EVALUATION SCHEME				TOTAL MARKS
		T	P	TOTAL		INTERNAL		EXTERNAL		
						Theory	Practical	Theory	Practical	
BP107P	Human Anatomy and Physiology I - Practical	-	4	4	2	--	15	--	35	50

LIST OF PRACTICALS:

SR.NO	PRACTICAL
1.	Study of compound microscope.
2.	Microscopic study of epithelial and connective tissue
3.	Microscopic study of muscular and nervous tissue
4.	Identification of axial bones
5.	Identification of appendicular bones
6.	Introduction to hemocytometry.
7.	Enumeration of white blood cell (WBC) count
8.	Enumeration of total red blood corpuscles (RBC) count
9.	Determination of bleeding time
10.	Determination of clotting time
11.	Estimation of hemoglobin content
12.	Determination of blood group.
13.	Determination of erythrocyte sedimentation rate (ESR).
14.	Determination of heart rate and pulse rate.
15.	Recording of blood pressure.

BOOKS RECOMMENDED

1.	Essentials of Medical Physiology by K. Sembulingam and P. Sembulingam. Jaypee brother's medical publishers, New Delhi.
2.	Anatomy and Physiology in Health and Illness by Kathleen J.W. Wilson, Churchill Livingstone, New York.
3.	Physiological basis of Medical Practice-Best and Tailor. Williams & Wilkins Co, Riverview, MI USA
4.	Text book of Medical Physiology- Arthur C, Guyton and John. E. Hall. Miamisburg, OH, USA.
5.	Principles of Anatomy and Physiology by Tortora Grabowski. Palmetto, GA, U.S.A.
6.	Textbook of Human Histology by Inderbir Singh, Jaypee brother's medical publishers, New Delhi.
7.	Textbook of Practical Physiology by C. L. Ghai, Jaypee brother's medical publishers, New Delhi.
8.	Practical workbook of Human Physiology by K. Srinageswari and Rajeev Sharma, Jaypee brother's medical publishers, New Delhi.
Reference Books (Latest Editions)	
9.	Physiological basis of Medical Practice-Best and Tailor. Williams & Wilkins Co, Riverview, MI USA
10.	Text book of Medical Physiology- Arthur C, Guyton and John. E. Hall. Miamisburg, OH, U.S.A.
11.	Human Physiology (Vol 1 and 2) by Dr. C.C. Chatterjee, Academic Publishers Kolkata

SUBJECT : PHARMACEUTICAL ANALYSIS I - THEORY
SUBJECT CODE : BP102T
SCOPE : This course deals with the fundamentals of analytical chemistry and principles of electrochemical analysis of drugs
OBJECTIVES Upon completion of the course, student shall be able to understand:

- Understand the principles of volumetric and electro chemical analysis
- Carry out various volumetric and electrochemical titrations
- Develop analytical skills

LEARNING OUTCOMES: At the end of the course the student will be able to:

1. Correctly sample the drug for testing
2. Carry out calculations involved in basic statistics.
3. Narrate the principles of methods and instruments used in assay of various drugs and chemicals.
4. Conduct assays of some drugs using these methods and instruments.

PREREQUISITES: Basic knowledge of physics, chemistry and pharmaceutical calculations taught in earlier semesters

TEACHING AND EVALUATION SCHEME:

SUB CODE	TITLE OF SUBJECT	TEACHING SCHEME (HRS)			CREDITS	EVALUATION SCHEME				TOTAL MARKS
		T	P	TOTAL		INTERNAL		EXTERNAL		
						Theory	Practical	Theory	Practical	
BP102T	Pharmaceutical Analysis I - Theory	3	-	3	4	25	--	75	--	100

Course content:

CH.NO	PARTICULARS	45 HRS
1	<ul style="list-style-type: none"> • Pharmaceutical analysis- Definition and scope <ol style="list-style-type: none"> I. Different techniques of analysis II. Methods of expressing concentration iii) Primary and secondary standards. III. Preparation and standardization of various molar and normal solutions- Oxalic acid, sodium hydroxide, hydrochloric acid, sodium thiosulphate, sulphuric acid, potassium permanganate and ceric ammonium sulphate. Errors: Sources of errors, types of errors, methods of minimizing errors, accuracy, precision and significant figures Pharmacopoeia, Sources of impurities in medicinal agents, limit tests. • Acid base titration: Theories of acid base indicators, classification of acid base titrations and theory involved in titrations of strong, weak, and very weak acids and bases, neutralization curves • Non-aqueous titration: Solvents, acidimetry and alkalimetry titration and estimation of Sodium benzoate and Ephedrine HCl 	10
2	<ul style="list-style-type: none"> • Precipitation titrations: Mohr's method, Volhard's, Modified Volhard's, Fajans method, estimation of sodium chloride. • Complexometric titration: Classification, metal ion indicators, masking and demasking reagents, estimation of Magnesium sulphate, and calcium gluconate. • Gravimetry: Principle and steps involved in gravimetric analysis. Purity of the precipitate: co-precipitation and post precipitation, Estimation of barium sulphate. • Basic Principles, methods and application of diazotization titration. 	10
	Redox titrations	8

	(a) Concepts of oxidation and reduction (b) Types of redox titrations (Principles and applications) Cerimetry, Iodimetry, Iodometry, Bromatometry, Dichrometry, Titration with potassium iodate	
3	Electrochemical methods of analysis <ul style="list-style-type: none">• Conductometry- Introduction, Conductivity cell, Conductometric titrations, applications.• Potentiometry - Electrochemical cell, construction and working of reference (Standard hydrogen, silver chloride electrode and calomel electrode) and indicator electrodes (metal electrodes and glass electrode), methods to determine end point of potentiometric titration and applications.• Polarography - Principle, Ilkovic equation, construction and working of dropping mercury electrode and rotating platinum electrode, applications	7

SUBJECT : PHARMACEUTICAL ANALYSIS I - PRACTICAL
SUBJECT CODE : BP108P

SUB CODE	TITLE OF SUBJECT	TEACHING SCHEME (HRS)			CREDITS	EVALUATION SCHEME				TOTAL MARKS
		T	P	TOTAL		INTERNAL		EXTERNAL		
						Theory	Practical	Theory	Practical	
BP108P	Pharmaceutical Analysis I - Practical	-	4	4	2	--	15	--	35	50

LIST OF PRACTICALS

SR.NO	PRACTICAL
I Limit Test of the following	
1.	Chloride
2.	Sulphate
3.	Iron
4.	Arsenic
II Preparation and standardization of	
5.	Sodium hydroxide
6.	Sulphuric acid
7.	Sodium thiosulfate
8.	Potassium permanganate
9.	Ceric ammonium sulphate
III Assay of the following compounds along with Standardization of Titrant	
10.	Ammonium chloride by acid base titration
11.	Ferrous sulphate by Cerimetry
12.	Copper sulphate by Iodometry
13.	Calcium gluconate by Complexometry
14.	Hydrogen peroxide by Permanganometry (6) Sodium benzoate by non-aqueous titration (7) Sodium Chloride by precipitation titration
IV Determination of Normality by electro-analytical methods	
15.	Conductometric titration of strong acid against strong base
16.	Conductometric titration of strong acid and weak acid against strong base
17.	Potentiometric titration of strong acid against strong base

SR.NO	NAME OF BOOK/REFERENCE
1.	A.H. Beckett & J.B. Stenlake's, Practical Pharmaceutical Chemistry Vol I & II, Stahlone Press of University of London
2.	A.I. Vogel, Text Book of Quantitative Inorganic analysis
3.	P. Gundu Rao, Inorganic Pharmaceutical Chemistry
4.	Bentley and Driver's Textbook of Pharmaceutical Chemistry
5.	John H. Kennedy, Analytical chemistry principles
6.	Indian Pharmacopoeia.

SUBJECT : PHARMACEUTICS I - THEORY
SUBJECT CODE : BP103T
SCOPE : This course is designed to impart a fundamental knowledge on the preparatory pharmacy with arts and science of preparing the different conventional dosage forms.

OBJECTIVES Upon completion of the course, student shall be able to understand:

- Know the history of profession of pharmacy
- Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations
- Understand the professional way of handling the prescription
- Preparation of various conventional dosage forms

LEARNING OUTCOMES: At the end of the course the student will be able to:

- Narrate various dosage forms, routes of administration and their merits and demerits
- Describe importance of environmental factors on drug manufacturing.
- Explain some unit processes used in industry.
- Describe the importance of certain physical properties of drugs and excipients and their utilization in drug manufacturing

PREREQUISITES: The student knowledgeable of basic physics and chemistry can take this course well.

TEACHING AND EVALUATION SCHEME:

SUB CODE	TITLE OF SUBJECT	TEACHING SCHEME (HRS)			CREDITS	EVALUATION SCHEME				TOTAL MARKS
		T	P	TOTAL		INTERNAL		EXTERNAL		
						Theory	Practical	Theory	Practical	
BP103T	Pharmaceutics I - Theory	3	-	3	4	25	--	75	--	100

Course content:

CH.NO	PARTICULARS	45 HRS
1	<p>Historical background and development of profession of pharmacy:</p> <ul style="list-style-type: none"> • History of profession of Pharmacy in India in relation to pharmacy education, industry and organization, • Pharmacy as a career, Pharmacopoeias: Introduction to IP, BP, USP and Extra Pharmacopoeia. • Different dosage forms, • Routes of administration and their comparisons, • Environment control in Pharmaceutical industry and its importance, • Importance of air, water, Humidity, Temperature in drug manufacturing giving some examples, • Introduction to various processes in Pharmaceutical manufacturing units • Prescription: Definition, Parts of prescription, handling of Prescription and • Errors in prescription. • Posology: Definition, Factors affecting posology. Pediatric dose calculations based on age, body weight and body surface area. 	10
2	<p>Pharmaceutical calculations: Weights and measures –</p> <ul style="list-style-type: none"> • Imperial & Metric system, • Calculations involving percentage solutions, allegation, proof spirit and isotonic solutions based on freezing point and molecular weight. <p>Powders:</p>	10

	<ul style="list-style-type: none"> • Definition, classification, advantages and disadvantages, • Simple & compound powders – official preparations, dusting powders, effervescent, efflorescent and hygroscopic powders, • Eutectic mixtures. Geometric dilutions. 	
	<p>Liquid dosage forms:</p> <ul style="list-style-type: none"> • Advantages and disadvantages of liquid dosage forms. • Excipients used in formulation of liquid dosage forms. • Solubility enhancement techniques 	
3	<p>Monophasic liquids: Definitions and preparations of Gargles, Mouthwashes, Throat Paint, Eardrops, Nasal drops, Enemas, Syrups, Elixirs, Liniments and Lotions.</p> <p>Biphasic liquids:</p> <ul style="list-style-type: none"> • Suspensions: Definition, advantages and disadvantages, classifications, Preparation of suspensions; Flocculated and Deflocculated suspension & stability problems and methods to overcome. • Emulsions: Definition, classification, emulsifying agent, test for the identification of type of Emulsion, Methods of preparation & stability problems and methods to overcome. 	10
4	<p>Suppositories: Definition, types, advantages and disadvantages, types of bases, methods of preparations. Displacement value & its calculations, evaluation of suppositories.</p> <p>Pharmaceutical incompatibilities: Definition, classification, physical, chemical and therapeutic incompatibilities with examples.</p>	8
5	<p>Semisolid dosage forms: Definitions, classification, mechanisms and Factors influencing dermal penetration of drugs. Preparation of ointments, pastes, creams and gels. Excipients used in semi solid dosage forms. Evaluation of semi solid dosages forms</p>	7

SUBJECT : PHARMACEUTICS I – PRACTICAL
SUBJECT CODE : BP109P

SUB CODE	TITLE OF SUBJECT	TEACHING SCHEME (HRS)			CREDITS	EVALUATION SCHEME				TOTAL MARKS
		T	P	TOTAL		INTERNAL		EXTERNAL		
						Theory	Practical	Theory	Practical	
BP109P	Pharmaceutics I - Practical	-	4	4	2	--	15	--	35	50

LIST OF PRACTICALS

SR.NO	PRACTICAL
1.	To prepare the list of market products as per physical form.
2.	To prepare the list of market products as per route of administration.
3.	To collect the data of environment requirements of various sections of Pharmaceutical industry.
4.	1. Conversion tables. 2. Household measures and conversions 3. Apothecary system units' conversions
5.	Syrups (a) Syrup IP'66 (b) Compound syrup of Ferrous Phosphate BPC'68
6.	Elixirs (a) Piperazine citrate elixir (b) Paracetamol pediatric elixir
7.	Linctus (a) Terpin Hydrate Linctus IP'66 (b) Iodine Throat Paint (Mandle's Paint)
8.	Solutions (a) Strong solution of ammonium acetate (b) Cresol with soap solution (c) Lugol's solution
9.	Suspensions (a) Calamine lotion (b) Magnesium Hydroxide mixture (c) Aluminium Hydroxide gel
10.	Emulsions (a) Turpentine Liniment (b) Liquid paraffin emulsion
11.	Powders and Granules (a) ORS powder (WHO) (b) Effervescent granules (c) Dusting powder (d) Divided powders
12.	Suppositories a) Glycero gelatin suppository b) Coca butter suppository c) Zinc oxide suppository
13.	Semisolids a) Sulphur ointment b) Non staining iodine ointment with methyl salicylate

	c) Carbopol gel
14.	Gargle Mouthwashes a) Iodine gargle b) Chlorhexidine mouthwash

Sr. NO	NAME OF BOOK/REFERENCE
1.	H.C. Ansel et al., Pharmaceutical Dosage Form and Drug Delivery System, Lippincott Williams and Walkins, New Delhi.
2.	M.E. Aulton, Pharmaceutics, The Science & Dosage Form Design, Churchill Livingstone, Edinburgh.
3.	Carter S. J., Cooper and Gunn's-Dispensing for Pharmaceutical Students, CBS publishers, New Delhi.
4.	Indian pharmacopoeia.
5.	British pharmacopoeia.
6.	Lachmann Theory and Practice of Industrial Pharmacy, Lea & Febiger Publisher, The University of Michigan.
7.	Alfonso R. Gennaro Remington. The Science and Practice of Pharmacy, Lippincott Williams, New Delhi.
8.	Carter S.J., Cooper and Gunn's. Tutorial Pharmacy, CBS Publications, New Delhi.
9.	E.A. Rawlins, Bentley's Text Book of Pharmaceutics, English Language Book Society, Elsevier Health Sciences, USA.
10.	Isaac Ghebre Sellassie: Pharmaceutical Pelletization Technology, Marcel Dekker, INC, New York.
11.	Dilip M. Parikh: Handbook of Pharmaceutical Granulation Technology, Marcel Dekker, INC, New York.
12.	Francoise Nieloud and Gilberte Marti-Mestres: Pharmaceutical Emulsions and Suspensions, Marcel Dekker, INC, New York.

SUBJECT : PHARMACEUTICAL INORGANIC CHEMISTRY - THEORY
SUBJECT CODE : BP104T
SCOPE : This subject deal with the monographs of inorganic drugs and pharmaceuticals.

OBJECTIVES Upon completion of the course, student shall be able to understand:

- Know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals
- Understand the medicinal and pharmaceutical importance of inorganic compounds

LEARNING OUTCOMES: At the end of the course the student will be able to:

1. Describe the method of preparation, assay principle for testing purity, official methods to measure the quality and medicinal uses of important inorganic compounds.
2. Refer the Pharmacopeia (monographs and appendices) for the drugs they study.
3. Prepare some standard reagents used in testing purity and quality of inorganic compounds.
4. Conduct limit tests for heavy metals, iron, arsenic, lead, chloride, sulphates as per pharmacopeia.
5. Conduct quantitative tests to identify inorganic mixtures

PREREQUISITES: The student should be knowledgeable of the basic chemistry learnt till HSC level.

TEACHING AND EVALUATION SCHEME:

SUB CODE	TITLE OF SUBJECT	TEACHING SCHEME (HRS)			CREDITS	EVALUATION SCHEME				TOTAL MARKS
		T	P	TOTAL		INTERNAL		EXTERNAL		
						Theory	Practical	Theory	Practical	
BP104T	Pharmaceutical Inorganic Chemistry - Theory	3	-	3	4	25	--	75	--	100

Course content:

CH.NO	PARTICULARS	45 HRS
1	Impurities in pharmaceutical substances: History of Pharmacopoeia, Sources and types of impurities, principle involved in the limit test for Chloride, Sulphate, Iron, Arsenic, Lead and Heavy metals, modified limit test for Chloride and Sulphate General methods of preparation, assay for the compounds superscripted with asterisk (*), properties and medicinal uses of inorganic compounds belonging to the following classes	10
	Acids, Bases and Buffers: Buffer equations and buffer capacity in general, buffers in pharmaceutical systems, preparation, stability, buffered isotonic solutions, measurements of tonicity, calculations and methods of adjusting isotonicity. <ul style="list-style-type: none"> • Major extra and intracellular electrolytes: Functions of major physiological ions, Electrolytes used in the replacement therapy: Sodium chloride*, Potassium chloride, Calcium gluconate* and Oral Rehydration Salt (ORS), Physiological acid base balance. • Dental products: Dentifrices, role of fluoride in the treatment of dental caries, Desensitizing agents, Calcium carbonate, Sodium fluoride, and Zinc eugenol cement. 	10
2	Gastrointestinal agents Acidifiers: Ammonium chloride* and Dil. HCl Antacid: Ideal properties of antacids, combinations of antacids, Sodium Bicarbonate*, Aluminum hydroxide gel, Magnesium hydroxide mixture Cathartics: Magnesium sulphate, Sodium orthophosphate, Kaolin and Bentonite Antimicrobials: Mechanism, classification, Potassium permanganate, Boric acid, Hydrogen peroxide*, Chlorinated lime*, Iodine and its preparations	10
	3	Miscellaneous compounds

Expectorants: Potassium iodide, Ammonium chloride*. Emetics: Copper sulphate*, Sodium potassium tartarate. Haematinics: Ferrous sulphate*, Ferrous gluconate Poison and Antidote: Sodium thiosulphate*, Activated charcoal, Sodium nitrite ³³³ Astringents: Zinc Sulphate, Potash Alum	
Radiopharmaceuticals: Radio activity, Measurement of radioactivity, Properties of α , β , γ -radiations, Half-life, radio isotopes and study of radio isotopes - Sodium iodide I ¹³¹ , Storage conditions, precautions & pharmaceutical application of radioactive substances.	7

SUBJECT : PHARMACEUTICAL INORGANIC CHEMISTRY - PRACTICAL
SUBJECT CODE : BP110P
SCOPE : This subject deal with the monographs of inorganic drugs and pharmaceuticals.
OBJECTIVES Upon completion of the course, student shall be able to understand:

- Know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals
- Understand the medicinal and pharmaceutical importance of inorganic compounds

PREREQUISITES: The student should be knowledgeable of the basic chemistry learnt till HSC level.

TEACHING AND EVALUATION SCHEME:

SUB CODE	TITLE OF SUBJECT	TEACHING SCHEME (HRS)			CREDITS	EVALUATION SCHEME				TOTAL MARKS
		T	P	TOTAL		INTERNAL		EXTERNAL		
						Theory	Practical	Theory	Practical	
BP110P	Pharmaceutical Inorganic Chemistry - Practical	-	4	4	2	--	15	--	35	50

LIST OF PRACTICALS

SR.NO	PRACTICAL
1.	Limit tests for following ions
2.	Limit test for Chlorides and Sulphates
3.	Modified limit test for Chlorides and Sulphates
4.	Limit test for Iron
5.	Limit test for Heavy metals
6.	Limit test for Lead
7.	Limit test for Arsenic
II Identification Test: Magnesium hydroxide, Ferrous sulphate, Sodium bicarbonate, Calcium gluconate, Copper sulphate	
III Test for purity	
8.	Swelling power of Bentonite
9.	Neutralizing capacity of aluminum hydroxide gel
10.	Determination of potassium iodate and iodine in potassium Iodide
IV Preparation of inorganic pharmaceuticals	
11.	Boric acid Potash Alum Ferrous sulphate

SR.NO	NAME OF BOOK/REFERENCE
1.	A.H. Beckett & J.B. Stenlake's, Practical Pharmaceutical Chemistry Vol I & II, Stahlone Press of University of London, 4th edition.
2.	A. I. Vogel, Text Book of Quantitative Inorganic analysis
3.	P. Gundu Rao, Inorganic Pharmaceutical Chemistry, 3rd Edition
4.	M.L Schroff, Inorganic Pharmaceutical Chemistry
5.	Bentley and Driver's Textbook of Pharmaceutical Chemistry
6.	Anand & Chatwal, Inorganic Pharmaceutical Chemistry
7.	Indian Pharmacopoeia

SUBJECT : COMMUNICATION SKILLS – THEORY*
SUBJECT CODE : BP105T
SCOPE : This course will prepare the young pharmacy student to interact effectively with doctors, nurses, dentists, physiotherapists and other health workers. At the end of this course the student will get the soft skills set to work cohesively with the team as a team player and will add value to the pharmaceutical business.

- OBJECTIVES** Upon completion of the course, student shall be able to understand:
1. Understand the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation
 2. Communicate effectively (Verbal and Non-Verbal)
 3. Effectively manage the team as a team player
 4. Develop interview skills
 5. Develop Leadership qualities and essentials

LEARNING OUTCOMES: At the end of the course the student will be able to:
 The student should be able to communicate well both verbally and in written form at various levels such as at interviews, group discussion, letter writing, writing proposals etc.

PREREQUISITES: Basic English

TEACHING AND EVALUATION SCHEME:

SUB CODE	TITLE OF SUBJECT	TEACHING SCHEME (HRS)			CREDITS	EVALUATION SCHEME				TOTAL MARKS
		T	P	TOTAL		INTERNAL		EXTERNAL		
						Theory	Practical	Theory	Practical	
BP105T	Communication skills – Theory*	2	-	2	2	15	--	35*	--	50

*NON-UNIVERSITY EXAM

Course content:

CH.NO	PARTICULARS	30 HRS
1	<ul style="list-style-type: none"> ❖ Communication Skills: Introduction, Definition, The Importance of Communication, The Communication Process – Source, Message, Encoding, Channel, Decoding, Receiver, Feedback, Context ❖ Barriers to communication: Physiological Barriers, Physical Barriers, Cultural Barriers, Language Barriers, Gender Barriers, Interpersonal Barriers, Psychological Barriers, Emotional barriers ❖ Perspectives in Communication: Introduction, Visual Perception, Language, Other factors affecting our perspective - Past Experiences, Prejudices, Feelings, Environment 	7
2	<ul style="list-style-type: none"> ❖ Elements of Communication: Introduction, Face to Face Communication - Tone of Voice, Body Language (Non-verbal communication), Verbal Communication, Physical Communication ❖ Communication Styles: Introduction, The Communication Styles Matrix with example for each -Direct Communication Style, Spirited Communication Style, Systematic Communication Style, Considerate Communication Style 	7
3	<ul style="list-style-type: none"> ❖ Basic Listening Skills: Introduction, Self-Awareness, Active Listening, Becoming an Active Listener, Listening in Difficult Situations ❖ Effective Written Communication: Introduction, When and When Not to 	7

	Use Written Communication - Complexity of the Topic, Amount of Discussion' Required, Shades of Meaning, Formal Communication ❖ Writing Effectively: Subject Lines, Put the Main Point First, Know Your Audience, Organization of the Message	
4	❖ Interview Skills: Purpose of an interview, Do's and Dont's of an interview ❖ Giving Presentations: Dealing with Fears, Planning your Presentation, Structuring Your Presentation, Delivering Your Presentation, Techniques of Delivery	5
5	❖ Group Discussion: Introduction, Communication skills in group discussion, Do's and Dont's of group discussion	4

SUBJECT : COMMUNICATION SKILLS – PRACTICAL*
SUBJECT CODE : BP111P
PREREQUISITES : Basic English
TEACHING AND EVALUATION SCHEME:

SUB CODE	TITLE OF SUBJECT	TEACHING SCHEME (HRS)			CREDITS	EVALUATION SCHEME				TOTAL MARKS
		T	P	TOTAL		INTERNAL		EXTERNAL		
						Theory	Practical	Theory	Practical	
BP111P	Communication Skills – Practical*	-	2	2	1	--	10	--	15*	25

*NON-UNIVERSITY EXAM

LIST OF PRACTICALS

SR.NO	PRACTICAL
	The following learning modules are to be conducted using words worth® English language lab software
1	Basic communication covering the following topics Meeting People Asking Questions Making Friends What did you do? Do's and Dont's.
2	Pronunciations covering the following topics Pronunciation (Consonant Sounds) Pronunciation and Nouns Pronunciation (Vowel Sounds).
3	Advanced Learning Listening Comprehension / Direct and Indirect Speech, Figures of Speech, Effective Communication, Writing Skills Effective Writing, Interview Handling Skills, E-Mail etiquette, Presentation Skills.

SR.NO	NAME OF BOOK/REFERENCE
1.	Basic communication skills for Technology, Andreja. J. Ruther Ford, 2nd Edition, Pearson Education, 2011
2.	Communication skills, Sanjay Kumar, Pushpalata, 1 st Edition, Oxford Press, 2011
3.	Organizational Behaviour, Stephen. P. Robbins, 1stEdition, Pearson, 2013
4.	Brilliant- Communication skills, Gill Hasson, 1stEdition, Pearson Life, 2011
5.	The Ace of Soft Skills: Attitude, Communication and Etiquette for success, Gopala Swamy Ramesh, 5thEdition, Pearson, 2013
6.	Developing your influencing skills, Deborah Dalley, Lois Burton, Margaret, Green hall, 1st Edition Universe of Learning LTD, 2010
7.	Communication skills for professionals, Konarnira, 2 nd Edition, New arrivals – PHI, 2011
8.	Personality development and soft skills, Barun K Mitra, 1 st Edition, Oxford Press, 2011
9.	Soft skill for everyone, Butter Field, 1 st Edition, Cengage Learning India Pvt. Ltd, 2011
10.	Soft skills and professional communication, Francis Peters SJ, 1 st Edition, Mc Graw Hill Education, 2011
11.	Effective communication, John Adair, 4thEdition, Pan Mac Millan, 2009
12.	Bringing out the best in people, Aubrey Daniels, 2ndEdition, Mc Graw Hill, 1999

SUBJECT : REMEDIAL MATHEMATICS - THEORY*
SUBJECT CODE : BP106RMT
SCOPE : This is an introductory course in mathematics. This subject deal with the introduction to Partial fraction, Logarithm, matrices and Determinant, Analytical geometry, Calculus, differential equation and Laplace transform.

OBJECTIVES Upon completion of the course, student shall be able to understand:

1. Know the theory and their application in Pharmacy
2. Solve the different types of problems by applying theory
3. Appreciate the important application of mathematics in Pharmacy

LEARNING OUTCOMES: At the end of the course the student will be able to:

- 1) Carry out routine calculations involved in pharmacy profession.
- 2) Draw and understand different graphs

PREREQUISITES: Basic knowledge of arithmetic, physics and chemistry.

TEACHING AND EVALUATION SCHEME:

SUB CODE	TITLE OF SUBJECT	TEACHING SCHEME (HRS)			CREDITS	EVALUATION SCHEME				TOTAL MARKS
		T	P	TOTAL		INTERNAL		EXTERNAL		
						Theory	Practical	Theory	Practical	
BP106RMT	Remedial Mathematics - Theory*	2	-	2	2	15	--	35	--	50

*NON-UNIVERSITY EXAM

Course content:

CH.NO	PARTICULARS	30 HRS
1	<p>Partial fraction Introduction, Polynomial, Rational fractions, Proper and Improper fractions, Partial fraction, Resolving into Partial fraction, Application of Partial Fraction in Chemical Kinetics and Pharmacokinetics</p> <p>Logarithms Introduction, Definition, Theorems/Properties of logarithms, Common logarithms, Characteristic and Mantissa, worked examples, application of logarithm to solve pharmaceutical problems.</p> <p>Function: Real Valued function, Classification of real valued functions,</p> <p>• Limits and continuity : Introduction , Limit of a function, Definition of limit of a function ($\epsilon - \delta$ definition) , $\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a} = na^{n-1}$, $\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$,</p>	6
2	<p>Matrices and Determinant:</p> <ul style="list-style-type: none"> • Introduction matrices, • Types of matrices, • Operation on matrices, • Transpose of a matrix, • Matrix Multiplication, • Determinants, Properties of determinants, Product of determinants, • Minors and co-Factors, • Adjoint or adjugate of a square matrix, • Singular and non-singular matrices, • Inverse of a matrix, 	6

	<ul style="list-style-type: none"> • Solution of system of linear of equations using matrix method, • Cramer's rule, • Characteristic equation and roots of a square matrix, • Cayley–Hamilton theorem, • Application of Matrices in solving Pharmacokinetic equations 	
3	<p>Calculus</p> <ul style="list-style-type: none"> • Differentiation: Introductions, • Derivative of a function, Derivative of a constant, Derivative of a product of a constant and a function, • Derivative of the sum or difference of two functions, • Derivative of the product of two functions (product formula), • Derivative of the quotient of two functions (Quotient formula) – Without Proof, Derivative of x^n w. r. tx, where n is any rational number, • Derivative of e^x, Derivative of $\log_e x$, Derivative of ax, Derivative of trigonometric functions from first principles (without Proof), • Successive Differentiation, • Conditions for a function to be a maximum or a minimum at a point. Application 	6
4	<p>Analytical Geometry:</p> <ul style="list-style-type: none"> • Introduction: Signs of the Coordinates, Distance formula, • Straight Line: Slope or gradient of a straight line, Conditions for parallelism and perpendicularity of two lines, Slope of a line joining two points, Slope – intercept form of a straight line • Integration: • Introduction, Definition, Standard formulae, Rules of integration, Method of substitution, • Method of Partial fractions, Integration by parts, definite integrals, application 	6
5	<p>Differential Equations:</p> <ul style="list-style-type: none"> • Some basic definitions, Order and degree, Equations in separable form, Homogeneous equations, • Linear Differential equations, • Exact equations, Application in solving Pharmacokinetic equations <p>Laplace Transform:</p> <ul style="list-style-type: none"> • Introduction, Definition, • Properties of Laplace transform, • Laplace Transforms of elementary functions, • Inverse Laplace transforms, • Laplace transform of derivatives, • Application to solve Linear differential equations, • Application in solving Chemical kinetics and Pharmacokinetics equations 	6

SR.NO	NAME OF BOOK/REFERENCE
1	Differential Calculus by Shanthinarayan
2	Pharmaceutical Mathematics with application to Pharmacy by Panchaksharappa Gowda D.H.
3	Integral Calculus by Shanthinarayan
4	Higher Engineering Mathematics by Dr. B. S. Grewal

SUBJECT : REMEDIAL BIOLOGY – THEORY*

SUBJECT CODE : BP106RBT

SCOPE To learn and understand the components of living world, structure and functional system of plant and animal kingdom.

OBJECTIVES Upon completion of the course, student shall be able to understand:

- Know the Classification and Salient Features of Five Kingdoms of Life
- Understand the Basic Components of Anatomy & Physiology of Plant
- Know Understand the Basic Components of Anatomy & Physiology Animal with Special Reference to Human

PREREQUISITES:

TEACHING AND EVALUATION SCHEME:

SUB CODE	TITLE OF SUBJECT	TEACHING SCHEME (HRS)			CREDITS	EVALUATION SCHEME				TOTAL MARKS
		T	P	TOTAL		INTERNAL		EXTERNAL		
						Theory	Practical	Theory	Practical	
BP106RBT	Remedial Biology - Theory*	2	-	2	2	15	--	35	--	50

*NON-UNIVERSITY EXAM

Course content:

CH.NO	PARTICULARS	30 HRS
1	<p>Living world:</p> <ul style="list-style-type: none"> • Definition and characters of living organisms • Diversity in the living world • Binomial nomenclature • Five kingdoms of life and basis of classification. Salient features of Monera, Protista, Fungi, Animalia and Plantae, Virus, • Morphology of Flowering plants • Morphology of different parts of flowering plants – Root, stem, inflorescence, flower, leaf, fruit, seed. • General Anatomy of Root, stem, leaf of monocotyledons & Dicotylidones 	7
2	<p>Body fluids and circulation</p> <ul style="list-style-type: none"> • Composition of blood, blood groups, coagulation of blood • Composition and functions of lymph • Human circulatory system • Structure of human heart and blood vessels • Cardiac cycle, cardiac output and ECG <p>Digestion and Absorption</p> <ul style="list-style-type: none"> • Human alimentary canal and digestive glands • Role of digestive enzymes • Digestion, absorption and assimilation of digested food <p>Breathing and respiration</p> <ul style="list-style-type: none"> • Human respiratory system • Mechanism of breathing and its regulation • Exchange of gases, transport of gases and regulation of respiration • Respiratory volumes 	7
3	<p>Excretory products and their elimination</p> <ul style="list-style-type: none"> • Modes of excretion • Human excretory system- structure and function 	7

	<ul style="list-style-type: none"> • Urine formation • Rennin angiotensin system <p>Neural control and coordination</p> <ul style="list-style-type: none"> • Definition and classification of nervous system • Structure of a neuron • Generation and conduction of nerve impulse • Structure of brain and spinal cord • Functions of cerebrum, cerebellum, hypothalamus and medulla oblongata <p>Chemical coordination and regulation</p> <ul style="list-style-type: none"> • Endocrine glands and their secretions • Functions of hormones secreted by endocrine glands <p>Human reproduction</p> <ul style="list-style-type: none"> • Parts of female reproductive system • Parts of male reproductive system • Spermatogenesis and Oogenesis • Menstrual cycle 	
4	<p>Plants and mineral nutrition:</p> <ul style="list-style-type: none"> • Essential mineral, macro and micronutrients • Nitrogen metabolism, Nitrogen cycle, biological nitrogen fixation • Photosynthesis • Autotrophic nutrition, photosynthesis, Photosynthetic pigments, Factors affecting photosynthesis. 	5
5	<p>Plant respiration: Respiration, glycolysis, fermentation (anaerobic).</p> <p>Plant growth and development</p> <ul style="list-style-type: none"> • Phases and rate of plant growth, Condition of growth, Introduction to plant growth regulators • Cell - The unit of life • Structure and functions of cell and cell organelles. Cell division • Tissues • Definition, types of tissues, location and functions. 	4

SUBJECT : REMEDIAL BIOLOGY – PRACTICAL*

SUBJECT CODE : BP112RBP

PREREQUISITES:

TEACHING AND EVALUATION SCHEME:

SUB CODE	TITLE OF SUBJECT	TEACHING SCHEME (HRS)			CREDITS	EVALUATION SCHEME				TOTAL MARKS
		T	P	TOTAL		INTERNAL		EXTERNAL		
						Theory	Practical	Theory	Practical	
BP112RBP	Remedial Biology – Practical*	-	2	2	1	--	10	--	15	25

*NON-UNIVERSITY EXAM

LIST OF PRACTICALS:

SR.NO	PRACTICAL
1.	Introduction to experiments in biology a) Study of Microscope b) Section cutting techniques c) Mounting and staining d) Permanent slide preparation
2.	Study of cell and its inclusions
3.	Study of Stem, Root, Leaf, seed, fruit, flower and their modifications
4.	Detailed study of frog by using computer models
5.	Microscopic study and identification of tissues pertinent to Stem, Root, Leaf, seed, fruit and flower
6.	Identification of bones
7.	Determination of blood group
8.	Determination of blood pressure
9.	Determination of tidal volume

SR.NO	NAME OF BOOK/REFERENCE
1	Practical human anatomy and physiology. by S. R. Kale and R. R. Kale.
2	A Manual of pharmaceutical biology practical by S. B. Gokhale, C. K. Kokate and S. P. Shriwastava.
4	Biology practical manual according to National core curriculum. Biology forum of Karnataka. Prof. M. J. H. Shafi

Text Books

(a)	Text book of Biology by S. B. Gokhale
(b)	A Text book of Biology by Dr. Thulajappa and Dr. Seetaram.

Reference Books

(a)	A Text book of Biology by B.V. Sreenivasa Naidu
(b)	A Text book of Biology by Naidu and Murthy c. Botany for Degree Students By A.C. Dutta.
(c)	Outlines of Zoology by M. Ekambaranatha Ayyer and T. N. Ananthakrishnan.
(d)	A manual for pharmaceutical biology practical by S.B. Gokhale and C. K. Kokate

EXAM NO _____

KADI SARVA VISHWAVIDYALAYA
SEMESTER END EXAMINATION (MONTH-YEAR)
B. PHARM SEM - (NEW)
(SUBJECT CODE) SUBJECT NAME

DATE:

TIME: 3 HRS

MARKS: 75

NOTE: 1) Attempt ALL the Questions from each section.
2) Tie both the Sections Separately.

SECTION-I

[40]

- Q.1 Answer the following questions (MCQs/fill in blanks/Objective/ T/F) one Marks each [10]
- Q.2 LONG Answer the following [10]
OR//
- Q.2 LONG Answer the following [10]
- Q.3 Short Answer the following [ANY FOUR] [20]
1)
2)
3)
4)
5)

SECTION-II

[35]

- Q.4 Answer the following questions (MCQs/fill in blanks/Objective/ T/F) marks each [10]
- Q.5 LONG Answer the following [10]
OR//
- Q.5 LONG Answer the following [10]
- Q.6 Short Answer the following [ANY THREE] [15]
1)
2)
3)
4)
