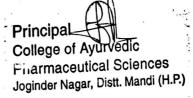
# Bachelor of Pharmacy-Ayurveda Program (B.Pharmacy Ayurveda) (Regular)

These ordinances shall be called the "Atal Medical & Research University" Ordinances for Bachelor of Pharmacy Ayurveda Program.  They shall come into force with immediate effect.  initions  "Academic Council" means the Academic Council of the University;  "Advisory Committee" means an Advisory Committee comprising of prominent and knowledges blass research University.							
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"Advisory Committee" means an Advisory Committee comprising of prominent and							
knowledgeable members having expertise in the area of Ayurvedic Pharmaceutical Sciences from within and outside the University or College;							
"Board" means the Board of Governors of the University;							
"Board of Studies" means the Board of Studies of the program;							
"Common Entrance Test (CET)" means a test conducted for admission to under-graduate degree programs as per the directions of the State Government of Himachal Pradesh from time to time;  Note: To be decided by the Atal Medical & Research University Mandi.							
"Institute or College" means an institution, organization, training center or other establishment providing teaching, research, and experimentation of practical training in Ayurvedic Pharmacy and is affiliated to the University;							
"NCC" means National Cadet Corps giving basic military training in small arms and parades;							
"NSS" means National Service Scheme an Indian government sponsored public service program conducted by Department of Youth Affairs and Sports of the Government of India for developing student's personality through community service; and							
"University" means the Atal Medical & Research University.							
ssion							

	(a	The admissions to B. Pharmacy (Ayurveda) program shall be as per rules and Regulations of the University and in accordance with the guidelines issued by the State and Central Government from time to time.
	(b	The admissions shall be made through centralized counseling on the basis of merit depending upon the availability of seats in the Institution.  Note: -To be decided by the Atal Medical & Research University Mandi
	(c)	Every student admitted to the Under Graduate degree program shall have to submit the necessary documents such as Migration Certificate /Transfer Certificate (in original), as the case may be, and attested copies of other required academic certificates. After completing all necessary formalities, a permanent Enrolment Number shall be provided to for all future references.
4.	Eli	gibility
	(a)	A candidate shall be eligible for admission to B. Pharmacy (Ayurveda) program if he/she has passed the Senior Secondary School Certificate (10+2) Examination or its equivalent from a recognized Board/University with Physics, Chemistry, Biology/ Mathematics as compulsory subjects securing 45 % marks in aggregate (40% for SC/ST category) in these subjects taken together.  Or  The grading system introduced by CBSE or any other Govt. recognized board equivalent to above percentage of marks will be considered eligibility for admission.
	(b)	The candidate must have appeared in Common Entrance Test (CET) during the corresponding year.  Note: To be decided by the Atal Medical & Research University Mandi
	(c)	Candidates sponsored by the Industries, Govt. Departments, established Institutes/ Research and Development (R&D) Organizations/National laboratories fulfilling the eligibility as per Clause 4(a) are also eligible to apply subject to production of sponsorship Certificate and Leave sanctioned from the employer.
	(d)	Foreign nationals whose applications are received through Indian Council for Cultural Relation, Government of India, fulfilling the eligibility as per Clause 4(a), are also eligible to apply.
	(e)	<b>Non-Resident Indians</b> fulfilling the eligibility as per <b>Clause 4(a)</b> are also eligible under the self-financing scheme, for which applications are invited through their embassies.
		The candidates who have passed two years Diploma in Pharmacy (Ayurveda) from a recognized Board/ University will also be eligible for admission to 2 <sup>nd</sup> year in B. Pharmacy Ayurveda Program under lateral entry scheme as notified by the Government from time to ime.

5	. Du	ration of the Program					
	(a)	Ho	student is ordinarily expected to complete the B. Pharmacy (Ayurveda) program in 8 nesters/ 6 Semesters (for lateral entry students) from the date of initial registration. wever, a student may complete the program at a slower pace by taking more time but in case, not more than 16 semesters / 12 semester (for lateral entry students) from the				
		date	e of initial registration in the program excluding rustication or temporary withdrawal				
	(b)	A s with	student, who fails to fulfill all the academic requirements for the award of the degree hin the stipulated period from the date of his /her initial admission, shall lose his/her				
6.	Ten	npora	ary Withdrawal from the Program				
	(a)	A st Univ	udent may be permitted to discontinue/withdraw from the program by the versity up to 2 years (4 Semesters) for reasons of ill health or others:				
		(i)	Provided the candidate applies to the Institute/Department within at least 2 weeks of the commencement of the semester or from the date he/she last attended his/her classes whichever is later, stating the reasons for such withdrawal together with supporting documents;				
		(ii)	Provided further that the Institute/Department is satisfied that, counting the period of withdrawal, the student is likely to complete his/her requirements of the B. Pharmacy (Ayurveda) degree within the maximum time limits specified for the program above.				
		(iii)	Provided further that there are no outstanding dues in the Department/Hostel/Library/NCC/NSS, etc. against the name of the candidate.				
÷		provi	adent who has been granted temporary withdrawal from the Institute under the sions of Clause 6(a) will be required to pay fees/charges during the period of leave. ever, fees once paid will not be refunded.				
	(c)	Norm	ally, a student shall be permitted only once to withdraw from the program.				
7.	Struc	ucture of the Program					
			institute shall have a curriculum for the program offered by it duly approved by the mic Council.				
			omplete program of study will consist of following categories of courses distributed ght semesters (6 semesters for lateral entry students):				



	(i)	The artiful (III)	i) for t	B. Pharmacy (Ayurveda) de Co-curricular and Extracurricula he courses as approved by the time.	ar activities) a	ind cour
	(ii)	The curriculum owork, seminars e	of indivi tc.	dual program shall include theo	ry and lab cour	ses, proj
	(iii)	training, if consi the end of 6 <sup>th</sup> se during end semes	egree. T dered ne mester a ster vacar	be satisfactorily completed bef he curriculum may show a cred ecessary. Normally industrial tra nd /or 7 <sup>th</sup> semester either in on tions.	it allocation for sining will be and e stretch or two	industri
(c)	credits .	A candidate has a completion of	5/ 113 fo to earn a	macy (Ayurveda) program sha or lateral entry and maximum of minimum of 155 credits/ 113 co macy (Ayurveda) under differen	160/118 for lat	eral entr
	S.NO	Component	Code	Subject	Credits allotted	
	1	Additional core	AC	Computer science, Industrial Training, Hospital Training, Project work	9	
	2	Program core	PC	That introduces students to Foundation of Ay. Pharmacy	143	
	3	Elective core	EC	Ayurvedic cosmetics, Yoga, AFI	4	
	4	Humanities and social sciences	HS	Environmental Science, Disaster management,	4	
			101	Total	160	
(d)	By the	Board of Studies	(here in	d credits shall be reviewed and up a after referred as BOS) of the mic Council for approval.	•	•
(e)	stream of BOS ma	of specialization and any grant permission to the some	nd succes	all the <i>core courses</i> listed in the ssfully complete all of them. How tudent not to register for some urses, depending on the courses lents in the program.	wever, the Depar	rtmental

	(f)	Courses identified as core courses are compulsorily to be studied by a student for the award of the B. Pharmacy Ayurveda degree. For electives, failure to earn credits does not necessarily require repeating the course. Instead, another approved elective could be permitted as a replacement course by the faculty advisor concerned. For some courses there could be a prerequisite courses completion requirement for registration.
	(g)	Medium of Instruction /Evaluation/etc. shall be English, Hindi and Sanskrit.
	-	
8.	Cre	dit System
	(a)	All courses have a Lecture/Tutorial/Practical component (L-T-P) to indicate the contact hours. 'T' and 'P' components of a course may be void. A separate Laboratory course (0-0-P) may also be provided. All courses have credit counts (C) which reflect their weightage depending on the number of hours of instruction per week.
	(b)	One lecture per hour per week shall normally be assigned one credit.
		A three hour of laboratory course per week shall normally be assigned one credit. The courses having three hours of contact every alternate week or two hours per week shall have one credit only; similarly, six hours of laboratory course per week shall normally be assigned two credits. This is for calculating credits only.
		Special courses like practical training, seminar, project, dissertation, group discussion, comprehensive viva-voce etc. shall have credits calculated by converting the load assigned in terms of equivalent lectures per week and applying the same principle as in (a).
	cr fo cu Th ha A	the curriculum of B. Pharmacy (Ayurveda) program is designed to have minimum 155 redits for the award of degree. For lateral entry students the number of credits to be earned or the award of the B.Pharmacy (Ayurveda) degree shall be in accordance with the arriculum of program concerned. The curriculum of the Lateral entry B. Pharmacy (Ayurveda) program shall be designed to the ve minimum credits in the 113 credits. Candidate must earn a minimum of 113 credits for successful completion of B. Pharmacy yurveda) under different categories of course as follows:

		S	.NO	Component	Code	Subject	Credits allotted	
				Program core	PC	That introduces students to Foundation of Ay. Pharmacy	109	
		2	: × +	Elective core	EC	Ayurvedic cosmetics, Yoga, AFI	4	
		3		Additional Core		Industrial training, Hospital training, Project work	9	
					A. L.	Total	122	
	(f)	- 1	a-curr cribed	ricular activities l NCC/NSS/Gen	carry no ceral Profic	credits and a student should sciency program by securing 'S	atisfactorily compl	ete the
	(g)	Acti Studinsti or 'U	vities/lents in tute to U' as ester a	Industrial visit/ may be taken of pexpose them to per Clause 14 against the Gener	Extension on conduct o various shall app ral Proficio		out beyond class works arranged industry. The gen ne student in ever	hours. by the eral 'S'
9.	(h)				ewed & ar	mended from time to time by	Board of studies.	
9.	En	ronne	пі апо	d Registration				
	(a)	prese be p	enting ursued	himself or herse	elf at the o	s, every student is required commencement of each seme rogram, on the date (s) notific	ster and for the co	urses to
-	(b)	fails consi on pa natur Direct from	to emideration deration derati	roll on the spect on of any comput of late fee as amity or family rincipal of the cate of first regist	ified date elling reas prescribe exigencion cerned ration.	nt and registration rests with for the purpose may be person (including medical reasoned by the University. However, the registration of a stud Institution/College up to a new person of the control of	rmitted late-registins), within the nex ver, under special ent may be allowed aximum period o	ration, in t 15 days cases of ed by the f 21 days
	(c)	A stu to be	dent r regist	nust ensure that ered on a specif	he/she hate a	as completed the pre-requisit t the beginning of a semester	tes, if any, for each	h course
	(d)	The re		ation procedure				
		(i)	ment	•	ses to be	um examination form pres pursued in the semester incl		

		(ii)	Payment of fees including examination fee and clearance of outstanding dues (mess library and others if any), and
		(iii)	Submission of the registration cum examination form and signing of the registration roll as notified by the College/Institution concerned.
	(e)	acade	dudent will be eligible for enrollment only if he/she has cleared all the dues of the rute, Hostel, Library, etc. up to the end of the previous semester and completed the emic requirement of all the previous semesters, provided he/she is not debarred from ment, on disciplinary grounds.
	(f)	Cone	list of all the registered students for the semester shall be sent to the University by the eges/Institutions/Departments on or before 30 September and 28 February respectively year for further processing and necessary action.
	(g)	The detair	registration cum examination form of each candidate must accompany the required fination fee as specified by the University to appear in the end semester examination. examination fee once paid shall not be refunded if a student is expelled or ned/debarred from appearing the end semester examination on account of shortage of dance, discipline or any other ground whatsoever.
	(h)	A stud	dent must ensure that he/she has earned the minimum specified credits to register for a cular semester as specified in <b>Clause 19</b> .
10.	Atte	endanc	e e
	(a)	activit emerg actuall	dent must attend every lecture, tutorial and practical class. To account for approved of absence (e.g. representing the University in sports, games or athletics, placement ties, NCC/NSS activities etc.) and /or any other such contingencies like medical gencies etc., the attendance requirement shall be a minimum of 75% of the classes ly conducted. However, the Principal may condone attendance to an extent of 10% in special cases. Each subject shall be treated as a separate unit for calculation of the
		attenda	ance.
	(b)	A cand	didate, who does not satisfy the attendance requirement, mentioned as above, shall be eligible to appear for the Examination of that subject and the candidate shall be ed to repeat the subject during the summer term or whenever it will be offered next.

The Head of the Department shall notify regularly, the list of such candidates who fall short of attendance. The list of the candidates falling short of attendance shall be sent to the Controller of Examination with a copy to Registrar of the University at least one week prior to the commencement of the examination. 11. Assessment & Evaluation The progress of the candidate shall be evaluated on the basis of continuous assessment. Each course shall have two components of assessment i.e. Internal Assessment (Component-I) and External Assessment (end semester examination/evaluation -Component-II). TAL BEDICAL & RESEARCH The Internal assessment (Component-I) is a continuous process spread over the semester (b) and involves components as mid semester examinations, home assignments, quizzes, surprise quiz, case analysis, attendance, etc. In order to maintain transparency in internal evaluation, the tests and quiz answer sheets will be shown to the students as per the request of students afterwards. The assessment in component-II will be based on the performance in the end semester (c) examination/Viva-voce examination/Presentation as the case may be. The evaluation in theory courses which involves written examination shall be carried out by the external examiner whereas in case of practical, projects, training, etc. it shall be carried out jointly by the course coordinator and external examiner. For each subject, there shall be passing minimum as follows: (d) i) For Internal Assessment 40% (16 out of 40 marks) ii) For External / end semester major examination 40% (24 out of 60 marks) iii) Overall 40% (40 out of 100marks). The assessment of a candidate in each subject shall be done on absolute marks basis - 100 in (e) case of theory courses and 50 in case of lab and other courses as follows: (i) Theory Courses Component Category Max. Marks I (a) Teachers Assessment (Assignments/Quizzes) 20 (b) Mid- Semester Examinations/Tests (Two mid-term tests) 20 **Total** 40 II **End-Semester Examination** 60 Total 100 (ii) Laboratory Courses

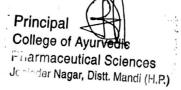
	Component	Category	Marks				
	I	(a) Teachers Assessment	15				
	,	(b) Viva-voce (two mid-term viva-voce tests)	10				
		Total					
	II	End-Semester Practical & viva-voce Examination					
		Total	50				
1	panel sugges	xaminers for component I & II shall be appointed by the sted by the head of the college/ institutions/department or thinners outside the suggested panel.	the University				
	(iii) Project/	Seminar					
	Component	Category	Marks				
2 ,r,k	I	Internal evaluation- The distribution and weightage to be decided by course coordinator	40				
1	II						
		Total					
	course and	roject/Seminar courses will be examined by the teacher(s) at one more Examiners from amongst the teachers of the					
	course and recommende	roject/Seminar courses will be examined by the teacher(s) a	ssociated with				
	course and recommende	Project/Seminar courses will be examined by the teacher(s) at one more Examiners from amongst the teachers of the ed by the Board of studies of the department concerned.  ial/Practical Training	ssociated with				
	course and recommende (iv) Industr	Project/Seminar courses will be examined by the teacher(s) at one more Examiners from amongst the teachers of the ed by the Board of studies of the department concerned.  ial/Practical Training  Category	associated with department to Marks				
	course and recommende	Project/Seminar courses will be examined by the teacher(s) at one more Examiners from amongst the teachers of the ed by the Board of studies of the department concerned.    Category	ssociated with department to				
	course and recommended  (iv) Industry  Component  (I) Interr	Project/Seminar courses will be examined by the teacher(s) at one more Examiners from amongst the teachers of the ed by the Board of studies of the department concerned.  ial/Practical Training  Category  nal Project Work	Marks				
	course and recommended  (iv) Industry  Component  (I) Interr	roject/Seminar courses will be examined by the teacher(s) at one more Examiners from amongst the teachers of the ed by the Board of studies of the department concerned.  ial/Practical Training  Category  nal Project Work nation Project Report	Marks  10 15 15 40				
	course and recommended  (iv) Industry  Component  (I) Interr	Project/Seminar courses will be examined by the teacher(s) at one more Examiners from amongst the teachers of the ed by the Board of studies of the department concerned.    Category	Marks 10 15 40 15				
	course and recommended  (iv) Industry  Component  (I) Interrute evaluation	Project/Seminar courses will be examined by the teacher(s) at one more Examiners from amongst the teachers of the ed by the Board of studies of the department concerned.    Category	Marks 10 15 15 40 15				
	course and recommended  (iv) Industry  Component  (I) Interrute evaluation  (II) External	roject/Seminar courses will be examined by the teacher(s) at one more Examiners from amongst the teachers of the ed by the Board of studies of the department concerned.    Category	Marks  10 15 15 40 15 15 30				
	course and recommended  (iv) Industry  Component  (I) Interrute evaluation  (II) External	Project/Seminar courses will be examined by the teacher(s) at one more Examiners from amongst the teachers of the ed by the Board of studies of the department concerned.    Category	Marks 10 15 15 40 15				
	course and recommended  (iv) Industry  Component  (I) Interrute evaluation  (II) External	Project/Seminar courses will be examined by the teacher(s) at one more Examiners from amongst the teachers of the ed by the Board of studies of the department concerned.    Category	Marks  10 15 15 40 15 15 30				
	course and recommended  (iv) Industry  Component  (I) Interrecevalu  (II) Externevalu	Project/Seminar courses will be examined by the teacher(s) at one more Examiners from amongst the teachers of the ed by the Board of studies of the department concerned.    Category	Marks  10 15 15 40 15 15 30 60				
	course and recommended  (iv) Industry  Component  (I) Interrevalu  (II) Externevalu  (v) Audit Component	Project/Seminar courses will be examined by the teacher(s) at one more Examiners from amongst the teachers of the ed by the Board of studies of the department concerned.    Category	Marks  10 15 15 15 40 15 15 60				
	course and recommended  (iv) Industry  Component  (I) Interrevalu  (II) Externevalu  (v) Audit Course State	Project/Seminar courses will be examined by the teacher(s) at one more Examiners from amongst the teachers of the ed by the Board of studies of the department concerned.    Category	Marks  10 15 15 15 40 15 15 00 60				
2. Ei	course and recommended  (iv) Industry  Component  (I) Interrevalu  (II) Exterevalu  (v) Audit Course State  Audit Pass	Project/Seminar courses will be examined by the teacher(s) at one more Examiners from amongst the teachers of the end by the Board of studies of the department concerned.    Category	Marks  10 15 15 15 40 15 15 00 60				

		(i)	has registered for tha	t course an	d paid the neces	sary fees;			
		(ii)	has minimum prescri						
		(iii)	has secured the minimand	mum presc	ribed marks in	Internal assessment (Component-			
		(iv)	should have complete the minimum prescrib	ed a minim ed mårks i	um of 8 / 4 expe	eriments in the lab course and secur			
13.	Gı	rading S							
	(a)	Abso	plute grading will be fise (Table 13.1).	followed in	respective of n	umber of students registered for a			
	100	Tabl	e 13.1			****			
		Tot	tal Marks secured by the Candidate	Grade	Point Value of Grade	Qualitative Assessment			
		91 an	ad above	О	10	Outstanding			
		81 an 91	d above but less than	Е	9	Excellent			
		71 an 81	d above but less than	A	8	Very Good			
		61 an 71	d above but less than	В	7	Good			
		51 and	d above but less than	C	6	Average/Fair			
		40 and	d above but less than	D	4	Pass (minimum pass grade)			
		Belov	v 40	F	-	Unsatisfactory (fail)			
	(b)		n a laboratory course, if a student obtains ≥51 marks and is graded as 'D' or 'F' based elative grading, he/she will be graded as 'C'.						
	(c)	A student who obtains 'F' grade has to reappear for the Component-II only. Such a student need not attend the classes and marks obtained in sessional tests, assignments, quizzes and attendance will be carried for the subsequent attempts of the student.							
	(d)	not obt	Grade "I" (Incomplete) is awarded to a student if he/she has shortage of attendance or does of obtain the minimum pass marks in the internal assessment (Component-I). Such a tudent has to re-register for the course during the summer term or whenever it is offered ext.						
+		(i) I	llness or accident which	disabled h	nim from appear	ing at the examination or			
-			any exigency in the fam pinion of the Institute, r						
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		Provided his/her attendance and performance in internal assessment are complete and
		satisfactory. Such a student chall be
		satisfactory. Such a student shall have to appear only in the end semester examination only
		during the summer term or along with the next semester examinations provided he/she
		registers for the same. The grade shall be converted in to appropriate letter grade
		depending upon his/her combined performance in the sessional and end semester
		examination.
14.	Dec	claration of Results
	-	natation of Results
	(a)	Normalized marks are referred to the Controller of Examination for the finalization of
		results. Controller of Examination assigns letter grades and announces the results.
	(2)	
	(b)	The satisfactory grade 'S' acquired by the student will be indicated in the grade card of the
	1.5	appropriate semester with an indication of the month and the year of passing. The
		Cumulative Grade Point Average (CGPA) will be accordingly revised.
		will be accordingly levised.
	(c)	The F/I grade once awarded stays in the record of the student and will be deleted when
		he/she completes the course successfully later. The grade acquired by the student will be
	100	indicated in the grade card of the appropriate semester with an indication of the month and
		the year of passing of that course.
15.	Peri	Formance Indices
13.	I CI	of mance findices
	(a)	At the end of every semester, a student's academic standing shall be determined by
		Semester Grade Point Average (SGPA), and a Cumulative Grade Point Average
		(CGPA).
	(b)	The SGPA is the credit-weighted average of grade points of all courses pursued by the
1	` /	student during a semester and is computed as follows:
		$\sum_{i=1}^{n} C_i G_i$
		$SGPA = \frac{\sum_{i=1}^{n} C_i G_i}{\sum_{i=1}^{n} C_i}$
		$\sum_{i=1}^{n} C_i$
	- 11	
	V	Where, 'C <sub>i</sub> ' is the course Credits allotted to the subject 'G <sub>i</sub> ' the grade-points earned and 'n' is
9	- 1	ne number of courses pursued by the student during the semester. It would indicate the
		erformance of the student in the semester to which it refers.
	lb	SHORMance of the student in the semester to which it refers.

	(c)	The CGPA is the credit-weighted average of grade points of all courses except "Graduating
		Course" passed by a student in all the semesters since admission. Starting from the second
		semester, at the end of each semester S, a Cumulative Grade Point Average (CGPA) will
		be computed for every student as follows:
		be computed for every student as follows: $CGPA = \sum_{i=1}^{m} C_i G_i$ $\sum_{i=1}^{m} C_i$
		$\sum_{i=1}^{L} C_{i}$
		where, 'm' is the total number of subjects the student has registered from the first semester onwards up to and including the semester S.
	(d)	Both SGPA and CGPA will be rounded off to the second place of decimal and recorded as such.
16.	Sup	plementary Examination
	(a)	A student failing in one or more subject will be allowed to appear/ pass in the next
		scheduled examination. The exact dates of examinations shall be notified from time to time.
	(b)	A student failing in the supplementary examinations will have to re-register for the course
		whenever it will be offered next.
	(c)	Marks sheets will be issued only once in a year after the result of supplementary examinations is declared, however a soft copy will be available at the end of each semester.
17.	Re-	riew of Answer Scripts
	Cor exa	ase any student is not satisfied with the evaluation in subject, he/she may apply to the roller of Examinations, along with the prescribed fee for review of end semester mination answer script within the stipulated time. The Controller of Examinations shall tate the review of the answer script and if any discrepancy is noticed during review the shall be rectified and the originally awarded grade shall be amended accordingly.
18.	Re-	egistration for Betterment
	(a)	A student may re-register to reappear in Component - II (theory part only) for improving the Grade in any course(s) subject to the following conditions:
		The student has obtained the lowest grade "D" in the course concerned, and
		i) The CGPA $\leq 6.5$
	(b)	A Student can re-register in a course at any time before the completion of his/her graduation program provided the University permits for it.
	(c)	For re-registering for a course, the student has to pay the pre-requisite fee as prescribed by he University.
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	(d)	A student cannot re-register for betterment in courses like Practical's, Professional Practice in Industries, summer internship, courses having course Structure 0-0-P, mini Project, Project Work, Practical training or any other courses which are conducted as vocational courses.						
(e) In case of re-registration for betterment, the student is exempted from attendin and the marks obtained in Component - I by the student earlier for that concarried forward.								
	(f)	obta	grade obtained by the student while repeating will be final and in no case the grade ained in previous attempt will be considered. However, such an improvement is not sidered for the award of Rank or Gold medal.					
19.	Pro	ogress	ion to Higher Semester					
	(a)	For I	Regular Students:					
		(i)	The candidate shall have cleared all the previous examinations before appearing for fifth semester examination. However, the candidates shall be permitted to attend the consecutive semesters.					
		(ii)	The candidate shall have cleared all the previous examinations before appearing for seventh semester examination. However, the candidates shall be permitted to attend consecutive semesters.					
		(iii)	The candidate shall have cleared all the previous examination before appearing for final year examination.					
		(iv)	The maximum period to complete the course successfully should not exceed eight (08) years.					
	(b)	For 1	Lateral Entry Students:					
		(i)	The candidate shall have cleared all the previous examinations before appearing for seventh semester examination. However, the candidates shall be permitted to attend consecutive semesters.					
		(ii)	The candidate shall have cleared all the previous examination before appearing for final year examination.					
		(iii)	The maximum period to complete the course successfully should not exceed six (06) years.					
	(c)		dent may be asked to register for a regular course or to do a substitute course if the course becomes obsolete and is not being offered anymore.					
	Dete	ntion						
		semes	dent shall be detained in a subject/course and will not be allowed to appear in the end ter examination (Component-II) if he/she secures less than minimum pass marks in al assessment (Component-I) and/or 75% of attendance in that course.					
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	(b)	)   In c	ase of the marks in continuous evaluation of any subject of a semester being less th
			or the attendance is less than 75 %, the student has to repeat the subject.
	(c)	A s	tudent shall be detained in a semester if he/she remain absent continuously for mor
			6 (six) weeks in a semester without sanctioned leave from the authorities concerned
			she has to repeat the semester.
21.	Te	rminat	ion from the Program
	(a)	A str	adent may be terminated from the program and his/her name will be struck off the rolls
	(4)		e candidate
	-	(i)	fails to secure a SGPA of 3.0 at the end of any semester. However, a student
		(1)	securing a SGPA below 3.0 may be allowed to continue in the following semester
			by the Director/Principal of the College on valid grounds to improve the CGPA in
			the following semester. A student who secures a CGPA below
			3.0 in four consecutive semesters will not be allowed to continue in the program.
		(ii)	Is found to have produced false documents or having made false declaration at the time of seeking admission.
		(iii)	is found to be pursuing regular studies and/or correspondence courses (leading to degree or diploma) in any other college, university or an educational institution.
		(iv)	On having been found to be concurrently employed and performing duty or carrying
		(11)	out business in contravention to academic schedule of the College/Institute.
$\dashv$	(b)	A stud	dent may be rusticated from the University/College on disciplinary grounds based on
	(0)		ecommendations of any committee or examination committee by the Vice
		1	sellor/Head of the Institution.
		Chane	
+	(c)	Mercy	Appeal: If the name of a student is removed from the rolls of the
	(0)	Unive	rsity/College, he/she may appeal to the Vice-Chancellor/Head of Institution stating
1	10	the rea	isons for not being able to abide by the regulations or earn the requisite credits and
	-	the Vi	ce-Chancellor/Head of Institution, if satisfied with the reasons, may allow the
			nation of admission of the student only once during the tenure of the program or
			the total duration of the program by two semesters, at the maximum, beyond 14
		semest	CIS.

	(d	) Une	der no circumstances a student will be allowed to complete the program after a lapse of
		14 :	semesters from the initial resistant.
		tem	semesters from the initial registration in the program. However, in case of rustication of
		sem	sporary withdrawal, the student shall be allowed to complete the program in 1 nesters.
22.	M	oderat	ion Committees
	-		
	(a)	Que	estion Paper Moderation Committee: There shall be a Question Paper Moderation
		Con	nmittee of the University consisting of the following members to moderate the End-
		Sem	nester Examination Question Paper(s) if required in view of large number of complaints
		fron	the students.
		(i)	Dean Academic – (Convener)
		(ii)	One subject expert who shall invariably be the paper setter and
		(iii)	One subject expert to be nominated by the Vice-Chancellor.
	(b)	Resu	alt Moderation Committee: There shall be a Result Moderation Committee of the
		conc	erned College/Department consisting of the following members to moderate course-
		wise	results of the End-Semester Examinations if required in view of extremely poor
		perfo	ormance by a large number of students:
		(i)	Controller of Examination - (Convener)
		(ii)	One subject expert who shall invariably the paper setter and
		(ii)	One subject expert to be nominated by the Vice-Chancellor.
$\top$		The F	Result Moderation Committee will examine the result of the course and in case of
		abnor	mal situation; it may suggest suitable corrective measure to amend the result or award
		grace	marks in appropriate component as the case may be. The controller of Examination
		will p	lace the evaluated answer scripts along with the brief solution and marking scheme
		before	the Committee. In case of difference of opinion among the members of the
	- 1	Comm	nittee, the majority decision will prevail.
3.	Grad	luating	g Requirement
4		<b>4</b> 4 1	1. If he are ideas to have completed the program every fully if he/she has
	(a)	A stud	ent shall be considered to have completed the program successfully if he/she has
+		(i) P	Passed successfully all courses prescribed in the curriculum/scheme;
-	+	(ii) e	arned the minimum credits specified for the degree; and
	(i	ii) ol	btained a minimum CGPA of 4.5 at the completion of the program.

(ii) Has passed all the subjects in not more than two attempts after the period. However, if the student has been permitted to go through break valid reasons, this period will not be counted as part of Stipulated /permitted period.  (c) All the other candidates who qualify for the degree are given second class.  (d) To convert CGPA into equivalent marks a multiplication factor of 9.5 is adopted CGPA 6.5 is equivalent to 6.5 x 9.5 = 61.75% of marks.  (e) Extra credits earned by the students will be counted for Honors degree, prizes a However, the grade obtained by re-registration, shall not be considered for the arms.  26. Award of Medals  (a) University may institute Gold and Silver medals to the highest and second here.											
the appropriate discipline by the University:  (i) completed the NCC / NSS/ General Proficiency requirements;  (ii) no dues to the Institute, Hostels, Libraries, NCC / NSS / etc. and  (iii) no disciplinary action is pending against him / her.  (b) The degree shall be awarded after the same is recommended by the Acade Council and approved by the Board of Governors of the University.  25. Classification of Awards  (a) A student is awarded 1st Class with distinction if the student passes all the cour in the first attempt within the permitted period and has more than 8.0 CGPA or grade. Even if a student takes break of study on valid reasons and pass all subjurarears, he/she is eligible to get 1st class with distinction.  (b) A student is awarded 1st Class if he/she  (i) has CGPA more than 6.5 at the completion of the required number of cruding the court of the student has been permitted to go through break valid reasons, this period will not be counted as part of Stipulated /permitted period.  (c) All the other candidates who qualify for the degree are given second class.  (d) To convert CGPA into equivalent marks a multiplication factor of 9.5 is adopted CGPA 6.5 is equivalent to 6.5 x 9.5 = 61.75% of marks.  (e) Extra credits earned by the students will be counted for Honors degree, prizes a However, the grade obtained by re-registration, shall not be considered for the a University may institute Gold and Silver medals to the highest and second he	requiremen										
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holders respectively as per CGPA and other academic conditions in each											
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	(b		anks/Positions will be determined at the end of the terminal semester. Only those studen to fulfill the following conditions will be eligible for ranks/positions:
		(i)	They do not have any break in their studies;
		(ii	They have passed every scheduled course in first attempt;
		(ii	i) They have passed every course on time as per the curriculum;
		(i	They have earned credits as per the schedule given in the curriculum;
	(c)		student fulfilling all the conditions stated in sub-clause 26(b) and obtaining CGPA of 9.5 d above shall be recommended by the Academic Council for Outstanding Performance.
		1	
27.	Cr	edit '	Cransfer Control of the Control of t
	(a)	fac	iversity offers Credit Accumulation and Credit Transfer frame work for promoting and ilitating inter University transfer and mobility of students across different Indian iversities and educational institutions.
	(b)		e procedure and conditions for transfer/ accepting of credits earned by a student shall be follows:
		(i)	Credit transfer from Atal Medical & Research University (here in after referred to as AMRU) to other University: Student from AMRU can take transfer to another University under the following conditions:
			AMRU has signed an Agreement with the University.
			A student has to pay the fees for all the remaining years when he/she seeks transfer.
			However, a student, after seeking transfer from AMRU can return to AMRU after a semester or year. Based on courses done in the other University, equivalent credits shall be awarded to such students.
		(ii)	Credit transfer from another University to AMRU: The University will accept the transfer of credits earned by a student from the following Institutions/Universities:
			Universities recognized under section 12(b) of the UGCAct.
			Universities as members of the Association of Indian Universities.
	_		Institutions established by the State and Central Governments.

Any Institution/University with which AMRU has a signed Agreement.

(c) When a student seeks transfer from other University to AMRU, equivalent credits based on the courses studied by him/her shall be assigned.

(d) To graduate from AMRU, a student must study at least half of the minimum duration prescribed for a program at AMRU.

28. Transitory Ordinance

Candidates admitted prior to the implementation of these Ordinances shall be governed by the Ordinances under which they were admitted. Students who fail in the courses that are no more offered in these new ordinances and new curriculum will be allowed to pass the alternative courses, and in case there are no alternative courses, the old courses may be offered. For such candidates, any marks obtained earlier shall not be taken into account for passing the course(s) and they will have to obtain marks in all components of evaluation afresh. A student admitted

previously may apply to the University to be governed by these ordinances.

#### 29. Powers To Modify

Notwithstanding all that has been stated above, if any difficulty arises in giving effect to the provisions of these Ordinances, the Vice-Chancellor may by order make such provisions not inconsistent with the Act, Statutes, Ordinances or other Regulations, as appears to be necessary or expedient to remove the difficulty. Every order made under these rules shall be subject to ratification by the Appropriate University Authorities. Such actions of Vice-Chancellor shall not be treated as precedence under any circumstances.



# B.PHARMACY (AYURVEDA)

SCHEME OF TEACHING AND EXAMINATION & SYLLABUS



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**B.PHARMACY (AYURVEDA)** 

**SCHEME OF TEACHING AND EXAMINATION** 



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2	PC	BPA- 102	Fundamentals of anatomy and physiology	3	•	•	3	20	20	40	60	100
3	PC	BPA- 103	Fundamentals of Bhaishajya kalpana-l	3	-		3	20	20	40	60	100
4	PC	BPA- 104	Fundamentals of Dravyaguna Vigyan-I	2	-	-	2	20	20	40	60	100
5	нѕ	BPA- 105	Environmental Sciences	2	-	-	2	20	20	40	60	100
6	AC	BPA- 106	Computer & its applications in Pharmaceutical Sciences	2	•		2	20	20	40	60	100
7	PC	BPA- 107	Pharmaceutical Biology	2	-		2	20	20	40	60	100
		Labs:	7		49							
1	PC	BPA- 111P	Fundamentals of anatomy and physiology		•	3	1	10	15	25	25	50
2	PC	BPA- 112P	Pharmaceutical Biology	•	•	3	1	10	15	25	25	50
3	PC	BPA- 113P	Fundamentals of Dravyaguna Vigyan-I	<b>.</b>	• «	3	1	10	15	25	25	50
4	AC	BPA- 114P	Computer & its applications in Pharmaceutical Sciences	•	•	3	1	10	15	25	25	50
			Total =	17		12	21					
						Total mark						900
		Total	Work load=29				Total cre	dit=21				

No.

П	Lecture	ECE	End Semester Examination
T	Tutorial	PC	Program Core
P	Practical	AC	Additional Core
CT	Class Test	HS	Humanities and Social Sciences
TA	Teachers Assessment	EC	Elective Core

			SCHEME O				D EXAMINA RVEDA)	TION				
EMEST	ER II		Б.Г	TAKI	VIAC	T (ATU	RVEDA)					
S.No.	Category of Paper	Paper code	Hours per			Examination						
				L	T	P/ D	2 k	Interna	l Asse:	ssment	ESE	Subj
				+				CT	TA	Total		
T	heory:	S 1 . 1	And a second of	i N	9 4	Ed I,	100 page	Just 100 pt	h- 1	4.8	- A	
1	PC	BPA- 201	Introduction to Pharmacology	3		•	3	20	20	40	60	10
2	PC	BPA- 202	Pharmaceutical chemistry (Organic & Inorganic)	3	-	•	3	20	20	40	60	100
3	PC	BPA- 203	Pharmacognosy-I	2	-		2	20	20	40	60	100
4	PC	204	Pharmaceutics-I (General and Dispensing Pharmacy)	3	•	•	3	20	20	40	60	100
5	PC	205	Rasa Shastra-I	3	-	· 4	3	20	20	40	60	100
6	PC	BPA- 206	Ayurveda Parichay including Roga Nidan evam chikitsa	2	•	•	2	20	20	40	60	100
7	HS	HS 103	Disaster Management	2	•	•	2	20	20	40	60	100
	LABS:			Sec.	1	a a shift						
1	PC	Situl comments and a second	Introduction to Pharmacology	•.89° 1-80° 2	•	3	1	10	15	25	25	50
2	PC	BPA- 212 P	Pharmaceutical chemistry (Organic & Inoganic)	- 12		3	1	10	15	25	25	50
3	PC	BPA- 213 P	Rasa Shastra-I	- 4		3	1	10	15	25	25	50
			Total =	18	•/s	9	21					
					354	Total	marks		4-04			850
			Total work load =27					Γotal credi	τ=27			

	Lecture	ECE	End Semester Examination	
T	Tutorial	PC	Program Core	
P	Practical	AC	Additional Core	
CT	Class Test	HS	Humanities and Social Sciences	
TA	Teachers Assessment	EC	Elective Core	

R III ategory f Paper  PC  PC	Paper code BPA- 301 BPA- 302	Title of Subject Dravyaguna Vigyan -II	B.PH	T		hing per	Credits	Internal		Examina		
ory: PC	BPA- 301 BPA-	Subject  Dravyaguna Vigyan -II	1 3	Н	ours we	per ak	Credits	Internal		d		
PC PC	301 BPA-	Vigyan -II	3	L	Т	P/D	7 6 6	Internal	Accor			
PC PC	301 BPA-	Vigyan -II	3		_	700	t that		Maaca	ssment	ESE	Subje- total
PC PC	301 BPA-	Vigyan -II	3					СТ	TA	Total		
	BPA-			is w	6.	zes • N	3	20	20	40	60	100
PC		Pharmacognosy of Ayurvedic Drugs-I	3		9 894 7 8 8 <sup>3</sup>	-	_ 3 <u></u>	20	20	40	60	100
	BPA- 303	Pharmaceutics (Physical pharmacy)	<b>8</b> 3	¥ 5	6.4	44 V.	3	20	20~	40	60	100
PC	BPA- 304	Rasshastra-II	2		-	•	2	20	20	40	60	100
PC	BPA- 305	Pharmacology-I	3		•	•	3	20	20	40	60	100
PC	BPA- 306	Applied Physiology	2		•	-	2	20	20	40	60	100
LABS:		may the state of t	1.09		-	10 July		- Maria				
PC	BPA- 311 P	Dravyaguna Vigyan -II	•		74. jú.	3	1	10	15	25	25	50
PC	BPA- 312 P	Pharmaceutics (Physical Pharmacy)	-		• Course	3	1	10	15	25	25	50
PC	BPA- 313P	Rasshast ra-II	-	ľ	7 <u>.</u> 200	3	1	10	15	25	25	50
PC	BPA- 314 P	Pharmacology-I	-		•	3	1	10	15	25	25	50
PC	BPA- 315 P	Applied Physiology	-		į.	3	1	10	15	25	25	50
		Total =	16		•	211			20			050
	7 8 3		0.4		20 A	Tot		4-1 1'4	24			850
	PC PC	311 P PC BPA- 312 P PC BPA- 313P PC BPA- 314 P PC BPA-	PC BPA- 314 P PC BPA- 312 P BPA- 313P Rasshast ra-II  PC BPA- 314 P PC BPA- 315 P PC BPA- 315 P Applied Physiology Total =	PC BPA- 314 P Vigyan -II PC BPA- 312 P (Physical Pharmacy) PC BPA- 313P Rasshast ra-II PC BPA- 314 P Pharmacology-I - 315 P Applied - Physiology	311 P   Vigyan -II   PC   BPA-   Pharmaceutics   - (Physical   Pharmacy)	311 P   Vigyan -II	311 P   Vigyan -II	311 P   Vigyan -II	Since   Sinc	311 P   Vigyan -II	311 P   Vigyan -II	State

L	Lecture	ECE	End Semester Examination
T	Tutorial	PC	Program Core
P	Practical	AC	Additional Core
CT	Class Test	HS	Humanities and Social Sciences
TA	Teachers Assessment	EC	Elective Core

			SCHEME OF TE	ACHIN	IG AN	ID EXA	MINATIO	N				
SEMES	TER IV		B.PHAF	RMACY	(AYL	JRVEDA	i)					
S.No.	Category of Paper	Paper code	Title of Subject		ching	g r weak	Cred its	Examination				
				L	T	P/D			Intern sessn		ESE	Subject total
T	heory:							CT	TA	Total		
1	PC	BPA- 401	Pharmaceutical analysis of Ayurvedic Drugs-I	3	Ou ·	E - [7	3	20	20	40	60	100
2	PC	BPA- 402	Pharmacology	3	•	-	3	20	20	40	60	100
3	PC	BPA- 403	Pharmacognosy of Ayurvedic Drugs-II	2	#4 T.	* • •	3	20	20	40	60	100
4	PC	BPA- 404	Pharmaceutics (Principles of Pharmaceutical operations)	3		per 3	2	20	20	40	60	100
5	PC	BPA- 405	Ras Shastra-III	3	- -		3	20	20	40	60	100
6	PC	BPA- 406	DravyagunaVigyan -III	2		•	2	20	20	40	60	100
	LABS				200	5. 100	Since Mil	200				
1	PC	BPA- 411 P	Pharmaceutical analysis of Ayurvedic Drugs-I	-	-	3	1	10	15	25	25	50
2	PC	BPA- 412P	Pharmacognosy of Ayurvedic Drugs-II	1856.7 (A) - (A) (A)	-	3	1	10	15	25	25	50
3	PC	BPA- 413P	Ras Shastra-III	•	•	3	1	10	15	25	25	50
4	PC	BPA- 414 P	DravyagunaVigyan -III	·	-	3	1	10	15	25	25	50
			Total =	16	1	12	20	ā				
		9			i a	otal mar	ks					
		-	Total work load =29	1	Copies.	80		Total c	redit=2	20		800

**Note:** Industrial training of Thirty days (30) is to be satisfactorily completed before a student is declared eligible for the degree. Normally industrial training will be arranged at the end of 4<sup>th</sup> semester either in one stretch or two stretches during end semester vacations.

# Legend

L	Lecture	ECE	End Semester Examination
T	Tutorial	PC	Program Core
P	Practical	AC	Additional Core
CT	Class Test	HS	Humanities and Social Sciences
TA	Teachers Assessment	EC	Elective Core

			SCHEME OF	TEA	CHIN	IG AND	EXAMINA"	TION	-			
SEMES	TER V		В.Р	HARN	IACY	(AYUF	RVEDA)					
S.No.	Category of Paper	Paper code	Title of Subject		Teaching Credits Hours per weak			E	xamina	tion		
				L	T	P/D		Internal	Asses	sment	ESE	Subject
TI	neory:						7027	CT	TA	Total		
1	PC	BPA- 501	Pharmacognosy -II	2	/ 10	• 12	2	20	20	40	60	100
2	PC	BPA- 502	Pharmaceutical Analysis of Ayurvedic Drugs-II	3	·	ā I	3	20	20	40	60	100
3	PC	BPA- 503	Pharmaceutical Technology for Ayurvedic drugs-l	3	•	•	3	20	20	40	60	100
4	PC	BPA- 504	Dravyaguna Vigyana-IV	3			3	20	20	40	60	100
5	PC	BPA- 505	Ras Shastra -IV	3		•	3	20	20	40	60	100
	LABS:			1839								
1	PC	BPA- 511 P	Pharmaceutical Analysis of Ayurvedic Drugs-II	•		3	1	10	15	25	25	50
2	PC	BPA- 512P	Pharmaceutical Technology for Ayurvedic drugs-l		•	3	1	10	15	25	25	50
3	PC	BPA- 513P	Dravyaguna Vigyana-IV	•	-	3	1	10	15	25	25	50
4	PC	BPA- 514 P	Ras Shastra -IV	•	•	3	1	10	15	25	25	50
5	CC	BPA- 515	Industrial training	•		•	2	•	40	40	60	100
			Total =	14		12	20	01				
					\$ <sub>NC,4</sub>	Tot	al marks					800
			Total work load =26	-	- 4		Total	credit=20				

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L	Lecture	ECE	End Semester Examination
T	Tutorial	PC	Program Core
P	Practical	AC	Additional Core
CT	Class Test	HS	Humanities and Social Sciences
TA	Teachers Assessment	EC	Elective Core

Principal College of Ayou

Finarmaceutical Sciences Joginder Nagar, Distt. Mandi (H.P.)

			SCHEME OF	TEAC	CHIN	G AND	EXAMINA	TION				
SEMES	TER VI		B.PH	IARM	ACY	(AYUF	RVEDA)					
S.No.	Category of Paper	Paper code		Н	Teaching ( Hours per weak		Credits	3 -eg	E	xaminat	tion	
		1		L	Τ	P/D		Internal	Asses	sment	ESE	Subject
T	2007/		9(7)	30 1	1 182	F 70E 1	40.5%	CT	TA	Total		
	heory:							•	•	•	•	•
1	PC	BPA- 601	Pharmaceutical Engineering	3	r		3	20	20	40	60	100
2	PC	BPA- 602	Pharmacology & Toxicology of Ayurvedic Drugs-I	3,	· K		3	20	20	40	60	100
3	PC	BPA- 603	Bhaishajya kalpana-II	. 3	-1-1		3	20	20	40	60	100
4	PC	BPA- 604	Pharmaceutical Microbiology	2	-	- H	2	20	20	40	60	100
5	PC	BPA- 605	Pharmacognosy -III	3	•	-	3	20	20	40	60	100
6	PC	BPA- 606	Pharmacology-II	3	- 03	-	3	20	20	40	60	100
g (W)	LABS		.877	1843	- 13							
1	PC	BPA- 611P	Bhaishajya kalpana-II	. •		3	1	10	15	25	25	50
2	PC	BPA- 612 P	Pharmaceutical Microbiology	-	35.9-	3	1	10	15	25	25	50
3	PC	BPA- 613 P	Pharmacognosy -III	¥ •	-	3	1	10	15	25	25	50
	, 10		Total =	17		9	20					
					7	То	tal marks					750
			Total work load =26	W.				Total cred	it=20	-		

**Note:** Hospital training of 15 days is to be satisfactorily completed before a student is declared eligible forthe degree. Normally hospital training will be arranged at the end of  $6^{\circ}$  semester either in one stretch or two stretches during end semester vacations.

#### Legend

L	Lecture	ECE	End Semester Examination
T	Tutorial	PC	Program Core
P	Practical	AC	Additional Core
CT	Class Test	HS	Humanities and Social Sciences
TA	Teachers Assessment	EC	Elective Core

SEMES	TER VII		SCHEME OF T B.Pha	RMAC	Y (AY	URVED	AMINATION (A)	l				
S.No.	Category of Paper	Paper code			Teacl Hours	ning s per	Credits			Exami	nation	
				L	T	P/D	The Market	A	Inter		ESE	Subje
TI	heory:			OK.		- 100	3)	СТ		Total		1014
1	PC	BPA- 701	Pharmacy Acts, Rules, Regulations, and Pharmaceutical Management	2			2	20	20	40	60	100
2	PC	BPA- 702	Pharmaceutical Technology for Ayurvedic Drugs-II	2	-	•	2	20	20	40	60	100
3	PC	BPA- 703	Pharmacology & Toxicology of Ayurvedic Drugs-II	2	-		2	20	20	40	60	100
4	PC	BPA- 704	Pharmaceutical analysis of Ayurvedic Drugs-III	2	•	-	2	20	20	40	60	100
5	PC	BPA- 705	Bhaishajyakalpana-III	2	•	-	2	20	20	40	60	100
6	EC	BPA- 706- I/II/III	YOGA/AFI/ Ayurvedic cosmetics	3	-	•	3	20	20	40	60	100
	LABS:			Eggs:	逝	Jak 2						3 . 3
1	PC	BPA- 711P	Pharmaceutical Technology for Ayurvedic Drugs-II	• 10.10		3	1	10	15	25	25	50
2	PC	BPA- 712P	Pharmaceutical analysis of Ayurvedic Drugs-III	•	•	3	1	10	15	25	25	50
3	PC	BPA- 713P	Bhaishajyakalpana-III	-	-	3	1	10	15	25	25	50
4		BPA- 714-P I/II/III	YOGA/AFI/ Ayurvedic cosmetics	pice.		3	s * 1	10	15	25	25	50
5	СС	715	Hospital Training	•	- 3	ecui .	2	×	40	40	60	100
			Total =   13   1   12   19								900	
			Total work load =26					tal cre	dit=19			

L	Lecture	ECE	End Semester Examination
T	Tutorial	PC	Program Core
P	Practical	AC	Additional Core
CT	Class Test	HS	Humanities and Social Sciences
TA	Teachers Assessment	EC	Elective Core

			SCHEME OF TE	ACH	NG /	AND E	XAMINATIO	N				
SEMES	TER VIII		B.PHAR	MAC	Y (A	YURV	EDA)					
S.No.	Category of Paper	Paper code	Title of Subject	Н	each ours wea	per	Credits		Examination			
,				L	T	P/D			Internal Assessment		ESE	Subject
T	heory:		2. 20 1 1 2 2 3					CT	TA	Total		
1	PC	BPA- 801	Medicinal Chemistry	2		· ·	2	20	20	40	60	100
2	PC	BPA- 802	Pharmaceutical Analysis	2	•	5 2	2	20	20	40	60	100
3	PC	BPA- 803	Bhaishajyakalpana-IV	3			3	20	20	40	60	100
4	PC	BPA- 804	Pharmacokinetics and bio pharmaceutics	3	•	••	3	20	20	40	60	100
5	PC	BPA- 805	Clinical Pharmacy	3		•	3	20	20	40	60	100
	LABS:				- 2000							
1	PC	BPA- 811 P	Pharmaceutical Analysis		•	3	1	10	15	25	25	50
2	PC	BPA- 812 P	Bhaishajyakalpana-IV	Wild	•	3	1	10	15	25	25	50
3	CC	BPA- 813	Project Work	-	•		2		40	40	60	100
4	PC	BPA- 814 P	Medicinal Chemistry	-	•	3	1	10	15	25	25	50
			Total =	13	50	9	18					
				Total marks								
	0.4	14	Total work load =22	W		1 63		Total cr	edit=18	a i 🖏	g - s -	

**Note**: Students will be allotted to prepare one specific Ayurvedic formulation. They will study the SOP as well as manufacture the formulatuion by observing API norms and they will also perform Quality Control tests and make a conclusion of Drug/Formulation.

# Legend

L	Lecture	EC	CE	End Semester Examination
T	Tutorial	PC	2	Program Core
P	Practical	AC	2	Additional Core
CT	Class Test	HS	S	Humanities and Social Sciences
TA	Teachers Assessment	EC	3	Elective Core

# SEMESTER VISE CREDITS ASSIGNED

S.NO.	SEMESTER	CREDITS ASSIGNED
1	st	21
2	2nd	21
3	3rd	21
4	4th	20
5	5th	20
6	6th	20
7	7 <sup>th</sup>	19
8	8th	18
() ( 전 ) ( ) ( ( ) ( ) ( ) ( ) ( ) ( ) (	Total	160

# **Distribution of credits**

-

S.NO	Component	Code	Subject	Credits allotted
1	Additional core	AC	Computer science, Industrial Training, Hospital Training, Project work	9
2	Program core	PC	That introduces students to foundation of Ay. Pharmacy	143
3	Elective core	EC	Ayurvedic cosmetics, Yoga, AFI	4
4	Humanities and social sciences	HS	Environmental Sciences, Disaster management	4
		- 25 m	Total = 160	



# RAJIV GANDHI GOVT. P.G. AYURVEDIC COLLEGE & HOSPITAL PAPROLA, KANGRA (HIMACHAL PRADESH) - 176115



Email: <u>principal.gacpaprola@gmail.com</u> Website: <u>www.paprolaayurved.org</u>

No: AYR/PGC/UG B.PHARMA/22/2024:-1637

Dated: | 6

To

The Controller of Examination Atal Medical & Research University H. P. at Ner Chowk Mandi-175008

Subject:

Regarding approval of absolute grading scheme for B. Pharmacy Ayurveda.

Sir,

Kindly refer to your letter No. AMRU/COE/EVEL/B.PHARMA/AYUR/2023/98 dated 18-01-2024 on the subject captioned above.

In this connection please find enclosed herewith minutes of meeting of Board of Studies in Indian System of Medicine of Atal Medical & Research University, Ner Chowk Mandi H. P. held on 16<sup>th</sup> of February 2024 vide which agenda proposed by the Prinicpal College of Ayurvedic Pharmaceutical Sciences Joginder Nagar Distt. Mandi(HP) regarding B.Pharmacy(Ayurveda) regulation, syllabus and Scheme of examination alongwith Absolute Grading Point System been approved.

It is submitted for your kind information and further necessary action please.

Encl.: (As above.)

Yours faithfully,

Prof. Vijay Chaudhary Chairperson, Board of Studies of ISM, Atal Medical & Research University H. P. Distt. Mandi

#### Minutes of Meeting

Meeting of Undergraduate Board of Studies in Indian System of Medicine of Atal medical & Research University, H. P. Ner Chowk Mandi(HP) was held in Hybrid Mode at 11.00am on 16<sup>th</sup> of February 2024 under the Chairmanship of Prof. Vijay Chaudhary, Dean- Faculty of Indian System Medicine-cum-Prinicpal Rajiv Gandhi Government Post Graduate Ayurvedic College & Hospital Paprola.

At the outset Prof. Vijay Chaudhary, Chairman Board of Studies in Indian System of Medicine of Atal medical & Research University welcomed the members. The following proposed agenda was discussed in detail and same was approved by all the members of Undergraduate Board of Studies in ISM of Atal Medical & Research University, HP:

Agenda I: Consideration of the agenda proposed by the Principal College of Ayurvedic Pharmaceutical Sciences Joginder Nagar Distt. Mandi regarding B. Pharmacy(Ayurveda) Regulation, syllabus and Scheme of Examination alongwith Absolute grading point System in Ordinance of Atal Medical & Research University, Himachal Pradesh Ner Chowk, Mandi Volume –I. Enclosure Annexure-I

<u>Decision taken:</u> After having a detailed discussion it was decided that B. Pharmacy(Ayurveda) Regulation, syllabus and Scheme of Examination alongwith Absolute grading point System may be incorporated in Ordinance of Atal Medical & Research University, Himachal Pradesh Ner Chowk, Mandi Volume –1.

Agenda II: No agenda was brought in the meeting on spot by the any member present in the meeting .

The meeting ended with thanks from the Chair.

Following members attended the meeting physically/virtually:

1. Principal, College of Ayurvedic Pharmaceutical Sciences Joginder Nagar Distt. Mandi(HP)

Hammon

2. Principal, Men-isee-Khang Sowa-Rigpa College, Dharamshala(HP).

3. Principal, Solan Homeopathic Medical College & hospital Kumarhatti, Distt. Solan(HP)

Dewadi

4. Prof. Rajesh sood, Professor & HOD Ayurveda samhita Evum Siddhant Deptt. RGG PG Ayurvedic College & Hospital Paprola Distt Kangra(HP)

5. Prof. Rajesh Manglesh, Professor & HOD Rog Nidan Deptt. RGG PG Ayurvedic College & Hospital Paprola Distt Kangra(HP).

6. Dr. Ashish Mehta (outside expert) Prof. & HOD Panchkarma, Shri Krishna Govt. Ayurvedic College, Kurukshetra, Haryana.

Prof. Wijay Chaudhary

Chairman, Board of Studies in Indian System of Medicine, Atal Medical Research University HP Distt. Mandi



ATAL MEDICAL & RESEARCH UNIVERSITY, HIMACHAL PRADESH

> इट्ड सायांकियान एक प्रनुपातान विक्वविकासम्बद्धाः विस्तावस्य प्रदेश

**B.PHARMACY (AYURVEDA)** 

**SYLLABUS** 

nmnu

ATAL MEDICAL & RESEARCH UNIVERSITY, HIMACHAL PRACESH

रूप मायांतिज्ञान एक प्रमुखास

SEMESTER-I

SEMESTER-I

BPA-101 FUNDAMENTALS OF AYURVEDA INCLUDING SWASTHAVRITTA

Teaching Scheme			Credits	N. Ma. Helling I	Marks	Duration of End		
L	Т	P/D	C	Sessional	End Semester Examination	Total	Semester Examination	
3	0	0	3	40	60	100	3 hrs	

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover theentire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

Introduction to Ayurveda - Definition of Ayu and Ayurved with introduction to Ashtanga Ayurved and introduction to basic principles of Ayurveda and their significance. Ayurvediya Padarth Vigyan and its importance. Characteristics and classification of Padarth. Laghutrayi and Brihattrayi Parichaya. Atymological derivation of the word Darshan and its classification.

#### Unit II

Basic Ayurvedic Concept - Concept of Dincharya, Ritucharya, Saddvritta and its relevance in the pharmaceutical sciences. Characteristics of Dik, Kala, Atma and Mana, Purush.

#### **Unit III**

Introduction and utility of Pramana – Pratyaksha, Anuman, Aaptopadesh and Yukti. Concept of Panchamahabhuta and its utility in pharmaceutical sciences. Intoduction to Dharniya and Adharniya vega.

#### **Unit IV**

**Triupstambh and Yoga basics** – Aahar according to Ayuveda, diet components, Nindra, Brahmcharya, Definition and importance of Yoga, Different types of Yoga, Components of ashtang yoga, Pranayama.

#### **Text Books:**

- 1. Dr. Ram Harsh Singh. Swasthvritta Vigyan Chaukhamba Prakashan, New Delhi, Varanasi.
- 2. Dr. Kashinath Samgandhi Swasthvritta Suddha Chaukhamba Prakashan, New Delhi, Varanasi.

#### Reference Books:

- 1. Charak Sahimta, Chaukhamba Prakashan, New Delhi, Varanasi.
- 2. Sushrat Sahimta, Meharchand Lakshamandas Prakashan, New Delhi.

## BPA 102 Fundamentals of Anatomy and Physiology

T	Teaching Scheme Credits				Marks	Duration of End		
L	Т	P/D	С	Sessional End Semester Examination		Total	Semester Examination	
3	0	0	3	40	60	100	3 hrs	

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

**Introduction to Human body** – Definition and scope of anatomy and physiology, General introduction to human body, Structure and function of cell, Basic tissues and their functions (Epithelial, Connective, Muscular and Nervous.)

#### **Unit II**

**Introduction to Skin, Skeletal system and joints** – Structure and function of skin, Divisions of skeletal system, types of bones, organization of skeletal muscle, physiology of muscle contraction, neuromuscular junction, types of joints and its functions.

#### **Unit III**

**Body fluids and blood** – Body fluids, composition and function of blood, mechanism of coagulation, blood grouping, Rh factors, Disorders of blood.

#### Unit IV

**Lymphatic system** – Lymphatic organs and tissues, lymphatic vessels, lymph circulations and function of lymphatic system.

#### **Text Books:**

1. A.C. Guyton & J.E. Hall, Text book of Medical Physiology published in India by Prism Books Ltd. on arrangement with W.B. Saunders Company, U.S.A., U.S.A., Ninth Edition, 1996.

- 2. C.A. Keele, E. Neil and N. Joels, Samson Wright's Applied physiology, Thirteenth Edition, published by Oxford University Press, 1982.
- 3. Cunningham's Textbook of Anatomy, edited by G.J. Romanes, Eleventh Edition, published by AMRU OxfordUniversity Press, 1972.

# Reference Books:

- 1. W.F. Ganong, Review of Medical Physiology, Thirteenth Edition, published by Appleton & Lange, U.S.A., 1987.
- 2. A.J. Vander, J.H. Sherman and D.S. Luciano, Human Physiology.
- 3. Ross and Wilson.Anatomy and Physiology in Health and Illness. Sydney: Churchill Livingstone.

4. Relative portions of Sushruta Samhita.

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# BPA-111 (P) Fundamentals of Anatomy and Physiology

	Teaching S	cheme	Credits		Marks		Duration of End
L	T P/D		С	Sessional	End Semester Examination	Total	Semester Examination
0	0	3-	1	25	25	50	3 hrs

Note: Practicals as per topics in the syllabus for the course will be conducted in the laboratory class.

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# List of experiments:

- 1. Introductory study of human skeleton.
- 2. Study of humerus, tibia fibla, scapla, vertebra.
- 3. Study of different systems with the help of charts and models.
- 4. Study of preserved human organs.
- 5. Recording of body temperature, pulse rate and blood pressure.
- 6. HB estimation, BT, CT, ESR recording.
- 7. Physico-chemical parameters of Urine.

#### Text Books:

- Gray's Anatomy, edited by P.L. Williams & R. Warwick, 38<sup>th</sup> Edition, published by Churchill livingstone, 1995.
- 2. Cunningham's Textbook of Anatomy, edited by G.J. Romanes, Eleventh Edition and published by Oxford University Press, 1972.

# Reference Books:

- 1. Tortora GJ, Derrickson B. Principles of Anatomy and Physiology. New York: John Wiley & Sons.
- 2. Ross and Wilson. Anatomy and Physiology in Health and Illness. Sydney: Churchill Livingstone.
- 3. Guyton AC, Hall JE. Textbook of Medical Physiology. New York: WB Sanders Co.

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**BPA- 103 FUNDAMENTALS OF BHAISHAJYA KALPANA-I** 

Te	Teaching Scheme			Marks			Duration of End
L	T	P/D	С	Sessional	End Semester Examination	Total	Semester Examination
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

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#### Unit I

# History of Bhaishajya Kalpana and its gradual development

Bhaishajya kalpana utpatti, Bheshaja, Aushadham, Kalpana, Qualitative and quantitative aspects of Aushadha Kalpana, Basic fundamentals of processing techniques, Yogas (compound formulation) and benefits of drug combination, Synergism, Potentiation, Pharmaceutical processes of Ayurveda, Bhaishajya Kalpana sankshipta itihasa and Kramika Vikasa.

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#### Unit II

# Adharabhuta siddhanta of Bhaishajya Kalpana-A

Paribhasha Glossary of Technical Terms: Lavanapanchaka, Lavana traya, Triphala, Trikatu, Ksharadravya, Ksharatraya, Ksharapanchaka, Ksharaashataka, Mutrastaka, Amlavarga Amlapanchaka, Panchtikta, Panchmrittika, Madhuratraya, Panchamrita, Panchgavya, Kshiratraya, Dudghavarga, Tailavarga.

#### **Unit III**

# Adharabhuta siddhanta of Bhaishajya Kalpana-B

Anuktadravyagrahana, selection of drugs, drugs to be used in wet-form, general rule, vishesokta dravya grahana, form of ausadha kalpana, naming a recipe, importance of Rasa, Guna, Virya, Vipaka, Karma and Prabhava, bhaishajya marga, matra, posology, anupana, aushadha sevena kala (time of drug administration), kalpana and their saviryataavadhi (formulae and their expiry dates), aushadha samrakshana vidhi (guidelines for the storage of medicines), antioxidants and preservatives.

#### Unit IV

# Ausadhanirmanashala (Rasashala) and brief introduction of Yantra

Rasashala, plan of pharmacy, section wise description of yantra (machines) mentioned in different prescribed sections in GMP, dolayantra, patalayantara, khalvayantra, saravasamputa importance of size reduction, mechanisms of grinding machines, disintegrator, cutter mill, roller mill, hammer mill, end runner mill, capsule filling machine, automatic capsule filling machine, rotary tablet machine, coating pan, Monsanto hardness tester, tablet disintegration test apparatus, simple distillation apparatus, hot-air oven.

Concept of aushadhi nirmanshala with respect of GMP in accordance to schedule T.

**Text Books:** 

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- 1. Text book of Bhaishajya Kalpana Vigyana (A Science of Indian Pharmacy) by Dr. K.RamachandraReddy, Chaukhamba.
- 2. Text Book of Bhaishajya Kalpana Vigyana by Dr. Siddhinandana Mishra, Chaukhamba SanskritBhawan, Varanasi.

Text book of Bhaishajya Kalpana Vigyana by Dr. Santosh Kumar Mishra, Chakhambha Orientalia, Varanasi.

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# Reference Books:

- 1. The Drugs & Cosmetics Act 1940.
- 2. The Ayurvedic Formulary of India, Part-I&II Govt. of India Publication.
- 3. The Ayurvedic Pharmacopoeia of India Part-II, Govt. of India Publication.
- 4. Ayurved Sara Sangraha.

Rasa Tantra Sara avum Siddha Prayog Sangraha, Sri Krishan Gopal Bhawan Kaleda, Rajasthan.

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## BPA-104 FUNDAMENTALS OF DRAVYAGUNA VIGYANA - I

Te	aching Schen	ne	Credits		Marks		Duration of End
L	Т	P/D	С	Sessional	ional End Semester Total Examination		Semester Examination
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I- Dravya avum dravya guna Shastra

Definition of dravya guna vigyan, importance, prayojan and vibhag. Sapat padhart of dravya guna vigyan-dravya, guna, rasa, vipaka, virya, prabhav, and karma.

Definition and importance of dravya, panchbhautik sanghatan and division of dravya- chetan achetan bhed, karya karan bhed, nishpatti bhed, yoni bhed, rasa bhed, virya bhed, dosh karam bhed.

Nomenclature of dravya dravya and bhibhag- adahar swaroop bhodhak avayav bhodhak, guna bhodhak, karam bhodhak, dsh bhodhak and kaal bhodhak.

#### Unit II- rasa,guna,veerya,vipak aur prabhava ka varnana

Definition and classification of rasa with panch bhodhik sangathan, definition and classification of guna with importance of gurvadi guna in chikitsha. Definition and classification of vipaka. Study of virya, importance and application of prabhav.

#### Unit III-Vividh Gana vivechan

Triphala, madhur triphala, sungandh triphala, swalp triphala. Trijaata, chaturjaata, trikattu, panchkol, panchpallav panchvalkal, trikantak, chaturbhadra, trikarshik, lakhupancmoola, vridahpancmoola, trinpancmoola, kantakpancmoola, madhyampancmoola, jeevanpancmoola, shadushana, cghaturushna, chaturveej, panchksharivrikash, madhurtraya, amalpanchak, mahapanchvish, upvish, ashatvarg.

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#### Unit IV-Karma -

Deepana, pachana, grahi, stambhana, bhedana, rechna, anulomana, sransana, sanshodhana, rasayan, vaajikarana, vyavayi, madkari, vikasi, swedhana, swedhenopaga, snehana, snehnopaga, vamana, vamanopaga, virechna, virechanopaga.

## **Text Books:**

- 1. Dravyaguna vijana; by Dr. Mansi Deshpandey, Chaukhamba Sanskrit Pratisnthana, NewDelhi.
- 2. Dravyaguna vijana Vol 1-5 by Prof.Sharma P.V; published by Chaukhambha Bharti Academy, Varanasi.

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# Reference Books:

- 1. The Wealth of India Publication and Directorate (CSIR, New Delhi)
- 2 Database on medicinal plants used in Ayurveda by CCRAS, New Delhi.

Indian Medicinal Plants by K.R.Kirtikar and B.D.Basu.

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# BPA-113 (P) FUNDAMENTALS OF DRAVYAGUNA VIGYANA - I

Te	Teaching Scheme				Marks		Duration of End
L	Т	P/D	С	Sessional	End Semester Examination	Total	Semester Examination
0	0	3	1	25	25	50	3 hrs

Note: Practical's as per topics in the syllabus mentioned below

- 1. Planatation of herbal plant in college campus and creation of herbal garden.
- Prepartion of herbarium sheets by collecting
   medicinal plants.

#### **Text Books:**

- 1. Dravyaguna vijana; by Dr. Mansi Deshpandey, Chaukhamba Sanskrit Pratisnthana, New Delhi.
- 2. Dravyaguna vijana Vol 1-5 by Prof.Sharma P.V; published by Chaukhambha Bharti Academy, Varanasi.

#### Reference Books:

- 1. The Wealth of India Publication and Directorate (CSIR, New Delhi)
- 2 .Database on medicinal plants used in Ayurveda by CCRAS, New Delhi.
- 3 .Indian Medicinal Plants by K.R.Kirtikar and B.D.Basu

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## **BPA 105 ENVIRONMENTAL SCIENCES**

Te	aching Schen	ne	Credits		Marks		Duration of End
L	L T P/D		С	Sessional End Semester Total		Total	Semester Examination
2	0	0	2	40	60	100	3 hrs

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### **UNIT I**

The Multidisciplinary nature of environmental studies: Natural Resources Renewable and non-renewable resources: Natural resources and associated problems a) Forest resources; b) Water resources; c) Mineral resources; d) Food resources; e) Energy resources; f) Land resources: Role of an individual in conservation of natural resources.

# **UNIT II**

Biodiversity: Introduction, genetic, species and ecosystem diversity, bio-geographic classification of India, value and importance of biodiversity, threats to biodiversity, endangered and endemic species in India, conservation of biodiversity.

#### **UNIT III**

Ecosystems: Concept of an ecosystem, Structure and function of an ecosystem, Introduction, types, characteristic features, structure and function of the ecosystems: Forest ecosystem; Grassland ecosystem; Desert ecosystem; Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

#### **UNIT IV**

Environmental Pollution: Air pollution; Water pollution; Soil pollution

# Text books (Latest edition):

- 1. Y.K. Sing, Environmental Science, New Age International Pvt, Publishers, Bangalore
- 2. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.

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# **BPA-106 COMPUTER AND ITS APPLICATIONS IN PHARMACEUTICAL SCIENCES**

Т	eaching Sche	eme	Credits		Duration of End		
L	Т	P/D	С	Sessional	End Semester Examination	Total	Semester Examination
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

- a) Fundamentals of Computer: Introduction to computers, Characteristics of computers, Historical perspective of computers, Computer generations, Types of computers and uses, Software and Hardware, Basic organization of a computer system and functions performed by each unit. Various Input devices like Keyboard, Mouse, Joystick, Electronic pen, Trackball etc. and output devices Printers, Monitors. Memory storage: Memory Cells, Semiconductor and Magnetic core memory, ROM and its types, RAM, Cache and Virtual Memory. Secondary Storage devices and their organization (Hard disk, Floppy disk, CD and DVD).
- b) Operating System: Definition, Need and organization of OS, Functions performed by operating system. Type of Operating System. DOS, windows, Directories and files. Commands (internal & external). Icons, Clipboard. Folders, Major differences between a DOS and Windows.

#### **Unit II**

- a) Data Communication and Networks: Basic elements of a commutation system, Data transmission mode, Network Topologies (ring, star, fully connected and Bus), LAN and WAN, Bounded and unbounded communication media.
- b) Internet Technology: Internet, Services provided by internet, Potential uses and abuses of internet, Working of search engine, Effective use of social media sites. Concept and implementation of E-Services (Digital India)

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#### **Unit III**

- a) Computer Virus: Definition, Causes and symptoms of virus, Types of viruses, Detections, prevention and cure against viruses using antivirus software packages.
- b) Role of Computers in Pharmacy: Use of computer in various pharmaceutical and clinical applications like drug information services hospital and community pharmacy, drug design, pharmacokinetics and data analysis.

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#### **Unit IV**

# Ms Office Package VERSITY, HIVACHEL PRADESH

- a) Word Processing Package: Features and uses of MS -Word processing, File handling(opening, creating, saving printing and editing), Formatting, Printing setups, Table Handling, Mail Marge, Spell check, file protection etc. in MS-Word.
- **b)Spreadsheet Package**: Basics of spreadsheet, feature and uses of Excel, Worksheet, formatting Sheets, Data(Sort and Filter), Calculation and graphing using formulae and function, Goal seek, scenario
- c)Presentation Package: Introduction to power point, features and uses of PowerPoint, creating a new presentation, editing and formatting, working with slides in different views, Animation, Transitions, Action buttons, Macros, Insert (text, slide, picture).

#### **Text Books:**

- 1. Sinha PK, Sinha P. Computer Fundamentals. New Delhi: BPB Publications.
- 2. Rajaraman V. Fundamental of Computers. New Delhi: Prentice Hall (India).

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# BPA-114 (P) COMPUTER AND ITS APPLICATIONS IN PHARMACEUTICAL SCIENCES

T	eaching Sch	ieme	Credits	100	Mark s		Duration of End
L	T	P/D	С	Sessional	End Semester Examination	Total	Semester Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

#### **List of Practicals:**

- 1. MS Word
- 2. MS Excel
- 3. Basic exercises of Internet
- 4. PowerPoint presentation
- 5. Basic exercises of spreadsheets
- 6. Basic exercises of E:mail
- 7. Basic exercises of searching databases related to Ayurvedic Pharmacy

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- 8. Basic exercises of Paint
- 9. Basic exercises of preparing Pdf files
- 10. Basic exercises of converting doc files into one another

#### **Text Books:**

- 1. Sinha PK, Sinha P. Computer Fundamentals. New Delhi: BPB Publications.
- 2. Rajaraman V. Fundamental of Computers. New Delhi: Prentice Hall (India).

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# **BPA- 107 PHARMACEUTICAL BIOLOGY**

	Teaching S	icheme	Credits		Marks		Duration of End Semester
L	Т	P/D	С	Sessional End Semest Examination		Total	End Semester Examination
	-		2	40	60	100	3 hrs

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and

shall be of 20 marks.

#### Unit -I

Structure of typical plant cell and its important inclusions including mitochondria, ribosomes, chloroplast, neucleus, endoplasmic reticulum, golgi apparatus, cytoplasm etc. Structure and functions of some important plant tissues like parenchyma, xylem, sclerenchyma, phloem etc.

#### Unit -II

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.

#### Unit -III

Principles of classification of plants with special reference to the plants of the following families. Studies of chemical constituents and medicinal value of Rutaceae, Leguminosae, Umbelliferae, Apocynaceae, Solanaceae, Convolvulaceae, Euphorbiaceae, Liliaceae, Zingiberaceae.

# Unit -IV

Definition of the crude, organized and unorganized drugs, Classification of the crude drugs including Alphabetical, morphological, microscopical, chemical etc.

Methods of systematic studies of the crude drugs, Cultivation methods, collection and storage of crude drugs.

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## **Text Books:**

- 1. A text book of 'Pharmacognosy' by R.K. Parmar, Vol.I, Edn.-I, P.Prakashan, India.
- 2. Kokate CK, Gokhale SB, Purohit AP: Parmacognosy 36th edn. Nirali Prakashan, Pune, India.
- 3.S.S HandaTextbook of Pharmacognosy Vallabh Publications, New Delhi.

## Reference Books:

- 1. Evans WC (3002): Trease and Evan's Pharmacognosy. 15<sup>th</sup>edn., Saunder' Elsevier Pvt Ltd. New Delhi-24, India.
- 2. Arya V, Kaur R. Kangrian Medicinal Flora. Ist edn. Pranav Prakashan, Kangra, H.P., India.
- 3. Khandelwal KR (3006): Practical Pharmacognosy Techniques and Experiments 16<sup>th</sup> Edn. Nirali Prakashan, Pune, India.

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# **BPA-112(P) PHARMACEUTICAL BIOLOGY**

	Teaching Sch	eme	Credits	Marks			Duration of End Semester
L	T P/		С	Sessional	End Semester Examination	Total	Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

# List of experiments:

- 1. To study different parts of leaves.
- 2. To study different parts of flowers.
- 3. To study different parts of fruits.
- 4. To study different parts of compound microscope.
- 5. To study different parts of binocular microscope.
- 6. To study different root systems
- To study difference between monocot and dicot plants morphologically.
- 8. To carry out morphology of leaves, flower and fruit.
- 9. To study different types of barks.
- 10. To study different Plant tissues like Parenchyma, collenchyma, sclerenchyma, xylem,phloem etc.

# Text Books:

- 1. A text book of 'Pharmacognosy' by R.K. Parmar, Vol.I, Edn.-I, P.Prakashan, India.
- 2. Kokate CK, Gokhale SB, Purohit AP: Parmacognosy 36<sup>th</sup> edn. Nirali Prakashan, Pune, India.

# Reference Books:

- 1. Evans WC (3002): Trease and Evan's Pharmacognosy. 15<sup>th</sup>edn., Saunder' Elsevier Pvt Ltd. New Delhi-24, India.
- 2. Khandelwal KR (3006): Practical Pharmacognosy Techniques and Experiments 16<sup>th</sup> Edn. NiraliPrakashan, Pune, India.

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# SEMESTER- II BPA-201 Introduction to Pharmacology

7	eaching Sc	heme	Credits	Credits Marks					
L	L T P/D C				End Semester Examination	Total	End Semester Examination		
3	0	0	3	40	60	100	3 hrs		

#### Unit-1

Introduction: Definition, scope and development of pharmacological thought (historical development). Routes of drug administration, agonists, antagonists, addiction, dependence, idiosyncrasy.

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#### Unit -2

Pharmacokinetics: Definition, biological membrane, Trasportation, diffusion and basic introduction to absorption, distribution, metabolism and excretion Bioavailability, bioequivalence,

#### Unit -3

Pharmacodynamics: Principles and mechanism of drug action. Classification of receptors. G-protein-coupled receptors, ion channel receptor, transmembrane enzyme linked receptors, transmembrane JAK- STAT binding receptors and receptors that regulate transcription factor.

#### Unit - 4

Adverse drug reactions, Drug interactions (Pharmacokinetic and pharmacodynamic). Drug discovery and clinical evaluation of new drug. Drug discovery phase, preclinical evaluation phase, clinical trial phase, phases of clinical trials and pharmacovigilance, Health education.

#### **Text Books:**

- 1. Essentials of Medical Pharmacology- KD Tripathi, latest edition.
- 2. A book of Clinical Pharmacology- R Kumar.

# Reference Books:

- 1. Rang MP, Dale MM, Riter JM. Pharmacology. New York: Churchill Livingstone.
- 2. Brunton LL, Lazo JS, Parker KL. Goodman and Gilman's The Pharmacological Basis of Therapeutics. New York: McGraw Hill.
- 3. Mycek MJ, Harvey RA, Champe PC. Lipponcott's Illustrated Reviews -Pharmacology.Philadelphia: Lippincott Williams & Wilkins.

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Introduction to Pharmacology **BPA-211 (P)** 

	Teaching Scheme Credits Marks							
L	T P/D C		С	Sessional	End Total Semester Examination		End Semester Examination	
0	0	3	1	25	25	50	3 hrs	

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

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# List of experiments:

- 1. Introduction to experimental pharmacology
- 2. Commonly used instruments in experimental pharmacology.
- 3. Study of common laboratory animals.
- 4. Maintenance of laboratory animals as per CPCSEA Guidelines.
- Study of different routes of drug administration in mice/rats.
- Study of local anaesthetics by different methods.
- 7. Dose calculation in pharmacological experiments.
- 8. Calculation of pharmacokinetics from given data.

# Text Book:

1. Kulkarni SK. Handbook of Experimental Pharmacology. New Delhi: Vallabh Prakashan.

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# BPA-202 PHARMACEUTICAL CHEMISTRY-(ORGANIC AND INORGANIC CHEMISTRY)

	Teaching Scheme			Mai	rks		<b>Duration of</b>
L	T	P/D C		Sessional	End Semester Examination	Total	End Semester Examinatio n
3	0	0	3	40	60	100	3 hrs

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### **ORGANIC CHEMISTRY**

#### Unit-I

# a.) Structure and Properties

Basic atomic and molecular structure with their properties- hybridization, valance bond theory, dipole moment, emperical formula, inter and intra molecular hydrogen bonding, ionic and covalent bonding in chemical compounds.

#### b.) Aliphatic Compounds

Structure, nomenclature, preparation and reactions of alkanes and Structure, nomenclature, preparation and reactions of alkenes. Inductive and electromeric effects.

#### Unit-II

# a.) Isomerisim

Isomerism and nomenclature and associated physicochemical properties, optical activity.

#### b.) Reaction Mechanisms

Addition reactions, Elimination reactions, Substitution reactions (nucleophilic and electrophilic substitutions).

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#### **INORGANIC CHEMISTRY**

#### **Unit-III**

#### a.)Introduction of Periodic Table

Introduction of periodic table, electronic configuration. Properties and important compounds of iron, gold and potassium.

# b.) Pharmaceutical Agents

Preparation and uses of Ammonium chloride and physical and chemical properties of Borax with their uses.

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#### **Unit-IV**

# a.) Quantitative and Qualitative study

General introduction of Quantitative and Qualitative study of heavy metals (Lead, arsenic, mercury) in Ayurvedic preparation.

# b.) Titrametric analysis

General introduction of Titrametric analysis and General introduction of Gravimetric methods of analysis.

#### **Text Books:**

- 1. Sykes PA. A Guidebook to Mechanisms in Organic Chemistry. Hyderabad: Orient Longman.
- 2. Vogel. Vogel's Textbook of Micro and Semmicro Qualitative Inorganic Analysis. Hyderabad

# Reference Books:

- 1. Block JH, Roche E, Soine TO, Wilson CO. Inorganic Medicinal and Pharmaceutical Chemistry. Philadelphia: Lea and Febiger.
- 2. Jeffery GH, Bessett J, Mendham J, Denney RC. Vogel's Textbook of Quantitative Inorganic Analysis including Elementary Instrumental Analysis. London: ELBS and Longman
- 3. Roberts JD, Caserio MC. Basic Principles of Organic Chemistry. New York: WA. Benjamin Inc.

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# BPA-212 P PHARMACEUTICAL CHEMISTRY- ORGANIC AND INORGANIC CHEMISTRY

Teaching Scheme			Credits	Marks		Duration of	
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

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# List of experiments:

- 1. To study instrumentation and working of pH meter.
- 2. To study instrumentation and working of distillation.
- 3. Determination of boiling point.
- 4. To prepare nitro benzene.
- 5. To prepare m-dinitrobenzene.
- 6. Limit test for chlorides, sulfates
- 7. Determination of melting point.
- 8. Identification of Nitrogen in compounds.
- 9. Identification of Halogen in compounds.
- 10. Estimation of NaOH by Titration.

#### Text Books:

- 1. Orient Longman.Atherden LM. Bentley and Driver's Textbook of Pharmaceutical Chemistry. New Delhi: Oxford University Press
- Vogel. Vogel's Textbook of Micro and Semmicro Qualitative Inorganic Analysis. Hyderabad:

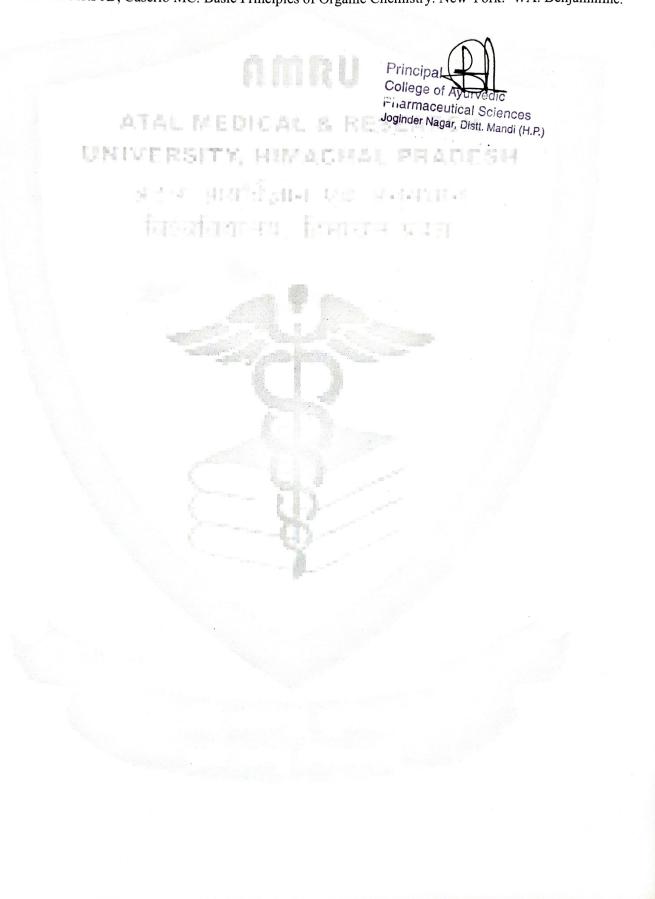
#### Reference Books:

- 1. Block JH, Roche E, Soine TO, Wilson CO. Inorganic Medicinal and Pharmaceutical Chemistry. Philadelphia: Lea and Febiger.
- 2. Jeffery GH, Bessett J, Mendham J, Denney RC. Vogel's Textbook of Quantitative Inorganic Analysis including Elementary Instrumental Analysis. London: ELBS and Longman

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- 3. Mann FC, Saunders BC. Practical Organic Chemistry. London: ELBS/ Longman.
- 4. Morrison TR, Boyd RN. Organic Chemistry. New Delhi: Prentice Hall India.
- 5. Roberts JD, Caserio MC. Basic Principles of Organic Chemistry. New York: WA. BenjaminInc.



#### BPA-203 PHARMACOGNOSY-I

	Teaching Scheme			Marks	<b>Duration</b> of		
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
2	0	0	2	40	60	100	3 hrs

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit-I

# Introduction to Pharmacognosy and Plant microscopy

Introduction, development, present status and future scope of Pharmacognosy. Techniques in microscopy covering use of mountants (water and glycerine), clearing agents (chloral hydrate), chemomicroscopic reagents (stains), micrometer, quantitative microscopy

#### Unit -II

Introduction to plant metabolites

Definitions of selected botanical terms related to groups of plant constituents: Carbohydrates, glycosides, tannins, lipids, volatile oils, terpenes, resins combinations, alkaloids, flavonoids, anthraquinones, coumarins, saponins, gums and mucilage's.

#### Unit -III

#### Sources of drugs

Terrestrial, Marine and Microbial and a brief introduction to following groups with biological source, chemical constituents and uses of the drugs listed:

Thallophytes:

(a) Algae-Diatoms, Agar and Alginic

Acid. (b)Fungi-Ergot, Yeast and

Mushrooms. Pteridophytes: Male fern

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#### Unit -IV

Spermatophytes: (a) Gymnosperms - Medicinal importance of family Pinaceae.

(b) Angiosperms- Covering important medicinal plants of families with reference to their biological source, major chemical constituents and uses: Apocynaceae, Compositae, Labiatae, Convolvulaceae, Liliaceae, Leguminosae, Papaveraceae, Rubiaceae, Rutaceae Solanaceae, Scrophulariaceae and Umbelliferae.

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## **Text Books:**

- 1. A text book of 'Pharmacognosy' by R.K. Parmar, Vol.I, Edn.-I, P.Prakashan, India.
- 2. Kokate CK, Gokhale SB, Purohit AP: Parmacognosy 36th edn. Nirali Prakashan, Pune, India.
- 3. S.S HandaTextbook of Pharmacognosy Vallabh Publications, New Delhi.

### Reference Books:

- 1. Evans WC (3002): Trease and Evan's Pharmacognosy. 15<sup>th</sup>edn., Saunder' Elsevier Pvt Ltd. New Delhi-24, India.
- 2. Quality Standards of Indian Medicinal Plants. New Delhi: ICMR.
- 3. Medicinal Plants of India. New Delhi: ICMR.

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BPA-204 PHARMACEUTICS- I (GENERAL AND DISPENSING PHARMACY)

	Teaching S	Scheme	Credit		Duration of End			
L	T	P/D	С	Sessiona   End   Total   Semester   Examination		Total	Semester Examination	
3	0	0	3	40	60	100	3 hrs	

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

Introduction and Scope of the Pharmacy Profession: Introduction and scope of pharmacy profession, Pharmacopoeias: Introduction to IP, BP, and USP.

**Pharmaceutical calculations:** Weights and measures – Imperial & Metric system. Simple calculation involved in preparing solutions of solids in liquids (W/V), liquids in liquids (V/V), Method of alligation.

Dosage forms: Introduction to dosage forms, classification and definitions

Posology: Definition, Pediatric dose calculations based on age, body weight and body surface area.

#### Unit II

Liquid dosage forms: Advantages and disadvantages of liquid dosage forms. Excipients used in formulation of liquid dosage forms.

Monophasic liquids: Definitions and preparation of Gargles, Mouthwashes, Throat Paint, Eardrops, Nasal drops, Enemas, Syrups, Elixirs, Liniments and Lotions.

**Biphasic liquids:** Suspensions: Definition, advantages and disadvantages, classifications, Preparation of suspensions; Flocculated and Deflocculated suspension & stability problems and methods to overcome. Emulsions: Definition, classification, emulsifying agents, test for the identification of type of Emulsion, Methods of preparation & stability problems and methods to overcome.

## **Unit III**

Semisolid dosage forms: Definitions, classification. Preparation of ointments, pastes, creams and gels. Excipients used in semi solid dosage forms. Evaluation of semi solid dosage forms.

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### **Unit IV**

Prescription: Definition, Parts of prescription, handling of Prescription.

**Pharmaceutical incompatibilities:** Definition, classification, physical, chemical and therapeutic incompatibilities with examples.

Text Books: Recent editions of the following books to be referred

1. L. Lachman, H.A. Lieberman and J.L. Kanig, The Theory and Practice of Industrial Pharmacy, Lea and Febiger, Philadelphia, U.S.A.

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2.N.K.Jain, Vallabh Prakashan, Text book of General & Dispensing Pharmacy, Edn. 2012, India.

#### Reference Books:

- 1. Indian Pharmacopoeia 2007. New Delhi: Indian Pharmacopoeia Commission
- 2. Remington, The Science and Practice of Pharmacy, Mack Publishing Co., U.S.A.
- 3.S.J. Carter, Dispensing for Pharmaceutical Students, 11<sup>th</sup> and 12<sup>th</sup> edition, 1967 and 1975, PitmanBooks Ltd., London, U.K.
- 4. M.E. Aulton, Pharmaceutics, The Science& Dosage Form Design, Churchill Livingstone, Edinburgh.
- 5. H.C. Ansel et al., Pharmaceutical Dosage Form and Drug Delivery System, LippincottWilliams and Walkins, New Delhi.

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#### BPA-205 RAS SHASTRA-I

Teaching Scheme			Credits	Marks		Duration of	
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
3	0	0	3	40	60	100	3 hrs

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

Definition and etymology of word Rasa, brief history of Rasa Shastra, concept of Rasa shala, concept of Rasamandap, importance of Rasaushadhi, concept of Rasa & Rasayana, fundamental principles of Rasashastra.

#### Unit-II

# Brief description of technical terminologies (Paribhasa prakarana)

Avapa, Nirvapa, Dhalana, Bhavana, Jarana, Murcchan, Shodhana, Marana, Varitara, Rekhapurna, Apunarbhava, Uttama, Niruttha, Amritikarana, Lohitikarana, Mrta loha, Satwa patana, Shuddhavarta, Bijavarta, Rudra bhaga and Dhanvantari bhaga etc. Concept of Shodhana, Marana and, Amritikarana with their importance as per classical and modern literature.

Dravya varga Amlavarga, Kshiratraya, Madhuratraya, Panchamrttika, Panchagavya, Panchamrta, Ksarastaka, Dravakagana, Mitra pancaka, Rakta varga, Sweta varga, Lavanapancaka etc.

#### **Unit-III**

## Brief description of yantra and their application

Ulukhala yantra, Khalva yantra, Kachchhapa yantra Urdhwa patan yantra, Adaha patan yantra, Jaranarth tula yantra, Dola yantra, Damaru yantra, Vidhyadhara yantra, Tiryak patana yantra, Patala yantra, Palika yantra, Puta yantra, Valuka yantra, Lavana yantra, Bhudhara yantra, Sthali yantra, Swedana yantra.

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#### **Unit-IV**

# Brief description and application of Musha (crucible) and Kosthi

Samanya Musa, Gostanimusa, Vajramusa, Maha musa, Yoga musa, Vrintak musa, Malla/pakwa musa, different types of crucibles. Satvapatana kosthi, Chullika, Patala kosthi, Gara kosthi, Angara kosthi and knowledge of various heating appliances viz. Gas stove, Hot plate and heating mantle.

#### Text Books:

1 Text book of Rasa Shastra by Dr. K.Ramachandra Reddy, Chaukhamba Sanskrit Bhawan, Varanasi 2 Text Book of Rasashastra by Dr. Siddhinandana Mishra ,Chaukhamba Sanskrit Bhawan, Varanasi

3 Text book of Nutan Ayurvediya Rasa Shastra by Dr. Santosh Kumar Mishra, ChaukhambhaOrientalia,Varanasi

#### Reference Books:

- 1. The Drugs & Cosmetics Act 1940.
- 2. The Ayurvedic Formulary of India, Part-I&II Govt. of India Publication.
- 3. The Ayurvedic Pharmacopoeia of India Part-II, Govt. of India Publication.
- 4. Ayurved Sar Sangraha.
- 5. Rasa Tantra Sara avum Siddha Prayog Sangraha, Sri Krishan Gopal Bhawan Kaleda, Rajasthan.

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# BPA-213(P) RASA SHASTRA-I

Teaching Scheme			Credits	Marks	Duration of		
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examinatio n
0	0	3	1	25	25	50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

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# List of experiments:

- 1. To study the classification of different Rasa Dravya.
- 2. To perform identification tests for different drugs of Maharasa group.
- 3. To perform identification tests for different drugs of Uparasa group.
- 4. To perform identification tests for different drugs of Sadharanarasa group.
- 5. To perform identification tests for different drugs of Dhatu-Upadhatu group.
- 6. To demonstrate different Heat appliances used in Ayurvedic Drug preparation.
- 7. To carry out Shodhana of ten drugs.
- 8. To carry out Bhavna and mardana.
- 9. To study the various classical tests and evaluate parameters of available sample of Bhasma.

#### **Text Books:**

- 1. Text book of Rasa Shastra by Dr. K.Ramachandra Reddy, Chaukhamba Sanskrit Bhawan, Varanasi
- 2. Text Book of Rasa Shastra by Dr. Siddhinandana Mishra ,Chaukhamba Sanskrit Bhawan, Varanasi
- 3. Text book of Nutan Ayurvediya Rasa Shastra by Dr. Santosh Kumar Mishra, ChakhambhaOrientalia, Varanasi

#### Reference Books:

- 1. The Drugs & Cosmetics Act 1940.
- 2. The Ayurvedic Formulary of India, Part-I&II Govt. of India Publication.
- 3. The Ayurvedic Pharmacopoeia of India Part-II, Govt. of India Publication.
- 4. Ayurved Sar Sangraha.
- 5. Rasa Tantra Sara avum Siddha Prayog Sangraha, Sri Krishan Gopal Bhawan Kaleda, Rajasthan.

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# BPA 206 AYURVEDA PARICHAY INCLUDING ROGA NIDAN EVAM CHIKITSA

	Teaching Scheme Credits			Marks	Duration of			
L	T	P/D	С	Sessional			End Semester Examination	
2	0	0	2	40	60	100	3 hrs	

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

### Unit I

Brief introduction of Ashtang Ayurveda, Ayurveda Utpatti and Vikas. Panchakarma, Kriyakalpa, Agnikarma, Kshara Karma etc. Special therapeutic procedures – brief description.

#### Unit II

Clinical importance of Chikitsa Chatuspada, Tridosha, Dhatu, Mala, Siddhanta.Definition and importance of Roga Vignan and Vikruti Vignan. Signs and symptoms of the increase and decrease of Doshas, Dhatu and Malas. Kriyakala.

## Unit III

The importance of srotasa in the production of diseases. Disorders, Causes, sign and symptoms of srotasa, Definition and types of Vyadhi (disease) Astha mahagada (major disease) and astha nindita (condemned)

#### **Unit IV**

General description and importance of Nidana - panchaka. Trividha Rogi pariksha vidhi (Darshana etc. three types of Methodology of investigating a patient). Signs, Symptoms and diseases of ojovyapata, ojokshaya and ojochyuti. Vyadhikshamatva (Immunity). General description of Janapadodhvamasaka vyadhi (Epidemics) and Aupsargika Roga and Sansargaja Roga (Infectious and communicable diseases).

#### **Reference Books:**

- 1. Charak Sahimta, Chaukhamba Prakashan, New Delhi, Varanasi.
- 2. Sushrat Sahimta, Meharchand Lakshamandas Prakashan, New Delhi.

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**HS 103-Disaster Management** 

	Teaching Scheme Credits			Marks	Pristance .	Duration of	
L	T	P/D	C	Sessional	End Semester Examination	Total	End Semester Examination
2	0	0	2	40	60	100	3 hrs

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### **UNIT I**

Introduction: Principles of Disaster Management. Natural Disasters such as Earthquake, Floods, Fire, Landslides, Tornado, Cyclones, Tsunamis, Nuclear, Chemical. Assessment of Disaster Vulnerability of a location and vulnerable groups, National policy on disaster Management.

#### **UNIT II**

Prevention, Preparedness and Mitigation measures for various Disasters, Post Disaster Relief & Logistics Management, Emergency Support Functions and their coordination mechanism, Resource & Material Management, Management of Relief Camp, Information systems & decision making tools.

### **UNIT III**

Renewable and non-renewable resources, Role of individual in conservation of natural resources for sustainable life styles. Use and over exploitation of Forest resources,

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Deforestation, Timber extraction, Mining, Dams and their effects on forest and tribal people.

#### **UNIT IV**

Global Environmental crisis, Current global environment issues, Global Warming, Greenhouse Effect, role of Carbon Dioxide and Methane, Ozone Problem, CFC's and Alternatives, Causes of Climate Change Energy Use: Past, present and future, Role of Engineers.

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# TEXT BOOKS: IVERSITY, HIVACHAL PRADESH

- 1. Disaster Management By G. K. Ghosh A. P. H. Publishing Corporation.
- 2. Environmental Studies, R Rajgopalan, Oxford University Press

#### **REFERENCE BOOKS:**

- 1. Disaster Management By B Narayan A. P. H. Publishing Corporation.
- 2. Environmental Studies, Basak, Pearson Publication.
- 3. Satish M. Citizen's guide to disaster management. New Delhi: Macmillan Publishers.
- 4. Duggal KN. Elements of public health engineering. New Delhi: S Chand & Co.
- 5. Trivedi RK, Goel PK. Introduction to air pollution. Hyderabad: BS Publications.
- 6. Rao CS. Environmental pollution control engineering. New Delhi: Wiley Eastern.

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#### Semester- III

#### **BPA-301 DRAVYA GUNA VIGYAN II**

Teaching Scheme			eaching Scheme Credits Marks				
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
3	0	0	3	40	60	100	3 hrs

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit-I

Basis of nomenclature of dravya, Basis and Derivation of synonyms. Ecology- Classification of geographical area (desha) and soil (bhumi), collection of dravya, Nature and quality of drug to be collected (swarupa of sangrahyadravya), Method of collection (Sangrahana vidhi), -Vegetable and Animal drugs according to part used. Period of collection according tovirya, preservation of collected dravyas, Storehouse (bheshajagara).

#### **Unit-II**

Ideal drug (Prashastabheshaja), Use of different parts of medicinal plants (bheshaja prayoga, rayojyanga), Incompatibility (knowledge of viruddhatwa), principles of preparation of Aushadha yoga, Consideration of vaya, bala, linga, agni, dosha, dushya, vyadhi, koshta, dehaprakriti, Abhyasa, satwa, deshakaal and kalpana for deciding dosage of drugs (Matranishchiti). Anupanavyavastha, time of administration (Bheshajasevanakaal), routes of drug administration (Bheshajaprayogamarga)

#### **Unit-III**

Detailed knowledge of following drugs with respect to Basonym of drug, Main Synonyms, Regional Name, Botanical Name, Family, classification of Dravya (Gana) as described in Charak, Sushrut and Bhavaprakasha i.e. Habit and habitat/varieties, External morphology, Useful parts, Important phytoconstituents, Rasa panchaka, Action on Dosha, Dhatu, Mala, Therapeutic indications, Amayikaprayoga and Matra (Therapeutic administration and Dose), Name of important formulations, Adverse effects, remedial measures and Shodhana (as required) 1.

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Ahiphena 2. Agnimantha 3.Agaru 4. Amalaki 5. Apamarga 6.Aragvadha 7. Ardraka-sunti 8. Arjuna 9.Arka 10. Ashvagandha 11. Ashvagola 12. Asoka 13. Ativisha 14. Bakuchi 15.Baladvayam. 16. Bharangi 17. Bhallataka 18.Bibhitaka 19. Bijaka/Vijayasara 20. Bilva 21.Brahmi 22. Bhrungaraj 23. Bruhati 24.Chandanadvaya, 25. Chitraka 26. Dadima 27.Danti 28. Daruharidra 29. Dhanyaka 30.Dhataki

#### **Unit-IV**

Detailed knowledge of following drugs with respect to Basonym of drug, Main Synonyms, Regional Name, Botanical Name, Family, classification of Dravya (Gana) as described in Charak, Sushrut and Bhavaprakasha i.e. Habit and habitat/varieties, External morphology, Useful parts, Important phytoconstituents, Rasa panchaka, Action on Dosha, Dhatu, Mala, Therapeutic indications, Amayikaprayoga and Matra (Therapeutic administration and Dose), Name of important formulations, Adverse effects, remedial measures and Shodhana (as required) 1. Draksha 2. Durva 3.Ela 4. Eranda 5. Gambhari 6.Gokshura 7. Guduchi 8. Guggulu 9.Haridra 10. Haritaki 11. Agastya 12. Akarakarabha

- 13.Ajamoda 14. Amra 15. Amragandhiharidra 16.Ankola 17. Aparajita 18. Ashvatha 19.Asthishrunkhala
- 20. Avartaki 21. Babbula 22.Badara 23. Bakula 24. Bhumyamalki 25.Bimbi 26. Bijapoora 27. Bola 28.Chandrashura 29. Changeri 30.Vrukshamla

#### **Text Books**

- 1. Dravyaguna vigyana by Dr. Mansi Deshpandey, Chaukhamba Sanskrit Pratisnthana, NewDelhi.
- 2. Dravyaguna vigyana Vol 1-5 by Prof.Sharma P.V; published by Chaukhambha Bharti Academy, Varanasi.

#### Reference Books

- 1. The Wealth of India Publication and Directorate (CSIR, New Delhi).
- 2. Database on medicinal plants used in Ayurveda by CCRAS, New Delhi.
- 3. Indian Medicinal Plants by K.R.Kirtikar and B.D.Basu.
  - 4. The Ayurvedic Pharmacopoeia of India, Govt of India Publication.

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#### **BPA-311P DRAVYA GUNA VIGYAN II**

	Teaching Scheme Credit			Marks	Duration of		
L	Т	P/D	С	Sessional	Sessional End Total Semester Examination		End Semester Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class.

- 1. To carry out survey in nearby places and identify and collect the rare medicinal plants (not less than 10)
- 2. Genuineness test of following substances: Gaudugdha, ghrita, hingu, madhu and guda.
- 3. Knowledge of market sample and price of dravya.

#### **Text Books-**

- 1. Dravyaguna vijana by Dr. Mansi Deshpandey, Chaukhamba Sanskrit Pratisnthana, New Delhi.
- Dravyaguna vijana Vol 1-5 by Prof.Sharma P.V; published by Chaukhambha Bharti Academy, Varanasi.

#### Reference Books:

- 1. The Wealth of India Publication and Directorate (CSIR, New Delhi).
- 2.Database on medicinal plants used in Ayurveda by CCRAS,New Delhi3 Indian Medicinal Plants by K.R.Kirtikar and B.D.Basu.
- 4. The Ayurvedic Pharmacopoeia of India, Govt of India Publication.

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# BPA-302 PHARMACOGNOSY OF AYURVEDIC DRUGS - I

	Teaching Scheme			Marks	les.		Duration of
L	Т	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

Systematic study of Crude drugs (Synonym, Biological source, Chemical constituents, uses, substitutes, pharmacology etc.) and factor affecting cultivation (altitude, temperature, humidity, rainfall, soil, fertilizers, pest and pest control), Collection, harvesting(drying) and Storage of crude drugs with examples. River system, mineral wealth and medicinal plants of Himachal Pradesh.

#### **Unit-II**

Theory of extraction, properties of solvent, extraction techniques including Maceration, Percolation, Soxhlation, Hydro-distillation, Digestion, Decoction, Infusion and a brief introduction to isolation techniques of plant secondary metabolites.

#### **Unit III**

# A) Drugs containing Plant metabolites

Study of Biological source, Chemical constituents and uses of Carbohydrates-Starch – Maize, Amrita Satwa, Honey. Gums – Babul niryas, Shalmali niryas.

Mucliages - Isabgola, Brihat gokshura, Bilvaphal, Svetamusli.

# B) Study of Biological source, Chemical constituents and uses of Volatile Oils

Dhanyaka, Misreya, Krishna jeerka, Sveta jiraka, Ajamoda, Yavani, Lavanga, Jaiphal, Talisapatra, Tamalpatra, Vastuka, Svetachandana, Vacha, Devadaru, Jatamansi, Nilgiri.

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c) Study of Biological source, Chemical constituents uses and organoleptic characters

of Tannis: Ashoka, Arjuna, Khadir, Karkatasringi, Mayaphal, Haritaki, Bhaibhitak and

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#### Amalaki.

#### **Unit IV**

Study of Biological source, Chemical constituents and uses of Glycosides a) Anthraquinone glycosides- Svarnapatri, Kumari, Manjishta, Aragvadha, Chakramarda.

b) Cardiac - Karavira, Arka, Vanapalandu, Digitalis. c) Saponins -Brahmi, Mandukparni,
 Laghugokshura, Arishtaka, Kantakari, Shatavari. d) Flavonoids - Yashtimadhu, Bhallataka,
 Karanja, Kalmegh, Palash. e) Coumarians - Bakuchi, Ajamoda. f)Bitters - Kiratikta, Katuki,
 Guduchi.

MEN HERENIN DE PARTIE

#### **Text Books:**

- 1. A text book of 'Pharmacognosy' by R.K. Parmar, Vol.I, Edn.-I, P. Prakashan, India.
- 2. Kokate CK, Gokhale SB, Purohit AP: Parmacognosy 36th edn. Nirali Prakashan, Pune, India.

#### Reference Books:

- 3. Evans WC (3002): Trease and Evan's Pharmacognosy. 15<sup>th</sup>edn., Saunder' Elsevier Pvt Ltd. NewDelhi-24, India.
- 4. Quality Standards of Indian Medicinal Plants. New Delhi: ICMR.
- 5. Medicinal Plants of India. New Delhi: ICMR.

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**BPA-303** 

# PHARMACEUTICS - PHYSICAL PHARMACY

Te	aching Sch	eme	Credits	Marks			Duration of
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
3	0	0	3	40	60	100	3 hṛs

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit-I

#### Introduction to following topics

Refractive index, density: bulk density, tapped density, angle of repose, use of screw gauge, vernier caliper and hardness tester for determination of tablet, vatti and guttica thickness and hardness.

Micrometrices: Particle and powder characteristics, particle size determination, derived properties of powders

#### **Unit-II**

# Surface and Interfacial Phenomenon

Liquid interface, surface and interfacial tensions, capillary rise methods, surface free energy, spreading coefficient, wetting phenomena, contact angle, critical surface tension, detergency, surface active agents.

HLB: Hydrophilic Lipophilic balance: concept, application of HLB, required HLB.

#### **Unit-III**

**Rheology:** Newtonian systems, law of flow, kinematic viscosity, effect of temperature,non-Newtonian systems, pseudoplastic, dilatant, plastic, thixotropy, thixotropy informulation, determination of viscosity, capillary, falling Sphere, rotational viscometers.

#### **Unit-IV**

**Drug Stability:** Physical degradation of drugs, chemical decomposition of drugs, Stability testing of dosage forms, storage methods and storage conditions.

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Text Books: Recent editions of the following books to be referred

- 1. Patrick J. Sinko, Martin's Physical Pharmacy. New Delhi: Wolters Kluwer Pvt. Ltd.
- 2. Subramanyam CVS. Text book of Physical Pharmacy. New Delhi: Vallabh Prakashan.

#### Reference Books:

- 1. Brey WS. Physical Chemistry and Biological Applications. London: Academic Press.
- 2. Shoemaker DP, Garland CW. Experiments in Physical Chemistry. New York: McGraw Hill. Remington, The Science and Practice of Pharmacy, Mack Publishing Co., U.S.A.

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#### **BPA-312P**

#### PHARMACEUTICS - PHYSICAL PHARMACY

I	Teaching Scheme			Marks			<b>Duration of</b>
L	T	P/D	С	Sessional	End	Total	End
	Sh.	TAL	EDIC	AL S	Semester Examination	RC.Hs	Semester Examination
0	F = 0, F = 5	3		25	25	50	3 hrs

## Note:

Practical's as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

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# List of experiments:

- 1. Determination of surface tension of given liquids by drop count and drop weightmethod
- 2. Determination of viscosity of liquids by Ostwald Viscometer.
- 3. Determination of angle of repose of Ayurvedic formulations and influence of lubricant on angle of repose
- 4. Determination of bulk density and tapped density of Ayurvedic formulations.
- 5. To prepare and dispense the biphasic liquid dosage form (Emulsion).
- 6. To prepare and dispense the coarse dispersion (Suspension). Determination of sedimentation volume with effect of different suspending agent
- Determination of thickness and diameter of tablet, Vatti, Guttika by screw gauge or vernier caliper.
- 8. Determination of Hardness of Ayurvedic tablets by different hardness testers.
- 9. Determination of viscosity of semisolid by using Brookfield viscometer.
- 10. Determination of refractive index of Ayurvedic formulations by using Abbe's refractometer.
- 11. Determination of refractive index of Ayurvedic formulations by using Handheld refractometer.

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12. Determination of partition coefficient.

Text Books: Recent editions of the following books to be referred

- 1. Patrick J.Sinko, Martin's Physical Pharmacy. New Delhi: Wolters Kluwer Pvt. Ltd.
- 2. Subramanyam CVS., J.Thimma Setty Laboratory manual of Physical pharmaceutics.

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NewDelhi: Vallabh Prakashan.

# Reference Books:

1. Brey WS. Physical Chemistry and Biological Applications. London: Academic Press.

2. Shoemaker DP, Garland CW. Experiments in Physical Chemistry. New York: McGraw Hill.

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3. Remington, The Science and Practice of Pharmacy, Mack Publishing Co., U.S.A.

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		В	PA-304	RAS	SHASTRA-II		
Teaching Scheme Credits				Marks		Duration of	
L	Т	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

Definition and types of Puta: Surya puta, Candra puta, Govara puta, Lawaka puta, Kukkuta puta, Kapota puta, Varaha puta, Gaja puta, Maha puta, Kumbha puta, Baluka puta, Bhudhara puta, Laghu puta.

#### Unit II

Knowledge of Parada, synonyms, occurrence, natural and artificial sources of Parada, Hingulad parada extraction, types of rasa, naisargika, yougika, aupadhika (kanchuka) etc Parada dosa and characteristics of Grahya-Agrahya Parada, Samanya and vishesha shodhana of Parada, Parada asta samskara, Parada gati and Rasa bandha.

#### Unit III

Murchhana and Jarana of Parada, Preparation & examination of Kajjali, types of ras ausadhis, knowledge of khalviya rasayana e.g. Tribhuvana kirthi rasa, Sutsekhar rasa, Parpati kalpa, Rasa parpati, Tamraparpati, Gagan Parpati, Kupipakva rasayan-rasa karpura, Rasa sindhura, Samirapannaga rasa, Siddha Makardhwaja, Shila Sindoor, Tamra Sindoor, Swarna Vanga, Pottali kalpa-Hemagarbha pottali.

#### Unit IV

Applications of Electric muffle furnace and fuel (diesel) dependant furnace.

Brief introduction of Quality Control, Standarization & GMP's of Rasa aushadhis.

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#### Text Books:

- 1. Text book of Rasa Shastra by Dr. K.Ramachandra Reddy, Chaukhamba Sanskrit Bhawan ,Varanasi
- 2. Text Book of Rasa Shastra by Dr. Siddhinandana Mishra ,Chaukhamba Sanskrit Bhawan, Varanasi
- 3. Text book Nutan Ayurvediya Rasa Shastra by Dr. Santosh Kumar Mishra, Chakhambha Orientalia, Varanasi

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#### **BPA-313 P**

#### RAS SHASTRA-II

	Teaching Scheme			Marks			Duration of
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

## List of experiments:

- 1. To extract Parada (Mercury) from its ore Hingula by classical Kanduk Yantra method.
- 2. To prepare Kajjali and its examination.
- 3. To prepare Rasa Parpati.
- 4. To prepare Shweta Parpati.
- 5. To study the identification of different drugs of Ratna varga.
- 6. To study the identification of different drugs of Upratna varga.
- 7. To study the identification of different drugs of Suddha varga.
- 8. To study the identification of different drugs of Sikata varga.
- 9. To study the identification of different drugs of Kshara varga.
- 10. To study the identification of different drugs of Visha and Upavisha varga.

#### Text Books:

- 1. Text book of Rasa Shastra by Dr. K.Ramachandra Reddy, Chaukhamba Sanskrit Bhawan ,Varanasi
- 2. Text Book of Rasa Shastra by Dr. Siddhinandana Mishra ,Chaukhamba Sanskrit Bhawan, Varanasi
- 3. Text book Nutan Ayurvediya Rasa Shastra by Dr. Santosh Kumar Mishra, Chakhambha Orientalia, Varanasi.

#### Reference Books:

- 1. The Drugs & Cosmetics Act 1940.
- 2. The Ayurvedic Formulary of India, Part-I&II Govt. of India Publication.
- 3. The Ayurvedic Pharmacopoeia of India Part-II, Govt. of India Publication.
- 4. Ayurved Sara Sangraha.

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5. Rasa Tantra Sara avum Siddha Prayog Sangraha, Sri Krishan Gopal Bhawan Kaleda, Rajasthan.

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**BPA-305 PHARMACOLOGY-I** 

L	Te	aching Sch	eme	Credits	Marks			Duration of
	L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
	3	0	0	3	40	60	100	3 hrs

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

Pharmacology of Autonomic Nervous System: Autonomic neurotransmission, parasympathomimetics, parasympatholytics, sympathomimetics, sympatholytics ganglion transmission and blocker, neuromuscular blocking agents and antispasticity drugs.

#### Unit II

Pharmacology of Central Nervous System: Synaptic transmission in the CNS, , hypnosedatives, analgesics, antipyretics, anti- inflammatory agents and drugs used in gout, anti- epileptics, antiparkinsonian drugs, psychopharmacological agents (antipsychotics, antianxiety and antidepressant agents), CNS stimulants and hallucinogens.

#### **Unit III**

General anaesthetics and Local anaesthetics- Classification, mechanism of action, adverse effects, contraindications).

In-vivo Synthesis of Histamine and antihistamine- Classification, mechanism of action, adverse effects, contraindications

#### **Unit IV**

Gastrointestinal disorders-Pathogenesis, sign and symptoms and pharmacology of Peptic ulcer, Duodenal ulcer, ulcerative colitis, IBD and basic introduction to Ayurvedic approach of GIT disorders (Ajirna, Parinamasula, Grahani).

#### **Text Books:**

- 1. Tripathi KD. Essential of medical Pharmacology, New Delhi: Jaypee Brothers Medical Publishers,
- 2. Ghosh MN. Fundamentals of Experimental Pharmacology. Kolkata: Scientific Book Agency.

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3. A book of Clinical Pharmacology- R Kumar.

#### Reference Books:

- 1. Rang MP, Dale MM, Riter JM. Pharmacology. New York: Churchill Livingstone.
- 2. Brunton LL, Lazo JS, Parker KL. Goodman and Gilman's The Pharmacological Basis of Therapeutics. New York: McGraw Hill.
- 3. Mycek MJ, Harvey RA, Champe PC. Lipponcott's Illustrated Reviews -Pharmacology. Philadelphia: Lippincott Williams & Wilkins

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**BPA-314 P PHARMACOLOGY-I** 

Teaching Scheme Credits Marks Duration of

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L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

# UNIVERSITY, HIMACHAL PRADESH List of experiments:

Note: All laboratory techniques and animal experiments are demonstrated by simulated experiments by softwares and videos

- 1. Test for pyrogens.
- 2. Biostatistics methods in experimental pharmacology (student's t test, ANOVA)
- 3. Biostatistics methods in experimental pharmacology (Chi square test, WilcoxonSigned Rank test)
- 4. Qualitative analysis of carbohydrates (Glucose, Fructose, Lactose, Maltose, Sucrose and starch)
- 5. Identification tests for Proteins (albumin and Casein)
- 6. Determination of blood sugar
- 7. Determination of serum total cholesterol
- 8. Qualitative analysis of urine for abnormal constituents
- 9. Study of first aid kit components

#### **Text Books:**

- 4. Text book of Rasa Shastra by Dr. K.Ramachandra Reddy, Chaukhamba Sanskrit Bhawan ,Varanasi
- 5. Text Book of Rasa Shastra by Dr. Siddhinandana Mishra ,Chaukhamba Sanskrit Bhawan,Varanasi
- Text book Nutan Ayurvediya Rasa Shastra by Dr. Santosh Kumar Mishra, ChakhambhaOrientalia, Varanasi

#### Reference Books:

- 1. The Drugs & Cosmetics Act 1940.
- 2. The Ayurvedic Formulary of India, Part-I&II Govt. of India Publication.
- 3. The Ayurvedic Pharmacopoeia of India Part-II, Govt. of India Publication.

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4. Ayurved Sara Sangraha.

5. Rasa Tantra Sara avum Siddha Prayog Sangraha, Sri Krishan Gopal Bhawan Kaleda, Rajasthan.

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# **BPA-306 APPLIED PHYSIOLOGY**

Te	eaching Sch	eme	Credits	Marks			
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
2	0	0	2	40	60	100	3 hrs

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit -I

**Nervous system** – Organization of nervous system, neurons, action potential, nerve impulse, receptor, synapse, neurotransmitters. Structure and function of brain.

#### Unit-II

**Digestive system** – General introduction to digestive system, organs of digestive system (Salivary glands, oesophagus, pancreas, stomach, liver, gall bladder, large intestine, small intestine, rectum and anus).

#### Unit -III

**Respiratory system** - General introduction to respiratory system, organs of respiratory system (Nasal cavity, larynx, pharynx, trachea, lungs, bronchii, alveoli). Transportation of gases (Oxygen and Carbon dioxide).

Reproductive system - General introduction to reproductive system and menstrual cycle.

#### Unit -IV

Cardiovascular system - General introduction to cardiovascular system. Structure and function of heart.

#### **Text Books:**

- 1. A.C. Guyton & J.E. Hall, Text book of Medical Physiology published in India by Prism BooksLtd. on arrangement with W.B. Saunders Company, U.S.A., U.S.A., Ninth Edition, 1996.
- 2. C.A. Keele, E. Neil and N. Joels, Samson Wright's Applied physiology, Thirteenth Edition, published by Oxford University Press, 1982.
- 3. Ayurvedic Kriya Sharir Vigyan by Shiv Kumar Gord.

# Reference Books:

- 1. W.F. Ganong, Review of Medical Physiology, Thirteenth Edition, published by Appleton &Lange, U.S.A., 1987.
- 2. A.J. Vander, J.H. Sherman and D.S. Luciano, Human Physiology

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# **BPA-315P APPLIED PHYSIOLOGY**

Te	eaching Sch	neme	Credits	Marks	loca .		Duration of
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
0	0	3	1-	25	25	50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class.

# List of experiments: CERSITY, HIMACHAL PRADESH

- 1. Urine Analysis.
- 2. Measurment of blood pressure.
- 3. Pulse examination.
- 4. Determination of Blood grouping.
- 5. Determination of Bleeding time.
- 6. Determination of Clotting time.
- 7. Estimation of Haemoglobin.
- 8. Demonstration of E.S.R.
- 9. Demonstration of E.C.G.

# Text Books:

- 1. A.C. Guyton & J.E. Hall, Text book of Medical Physiology published in India by Prism BooksLtd. on arrangement with W.B. Saunders Company, U.S.A., U.S.A., Ninth Edition, 1996.
- 2. C.A. Keele, E. Neil and N. Joels, Samson Wright's Applied physiology, Thirteenth Edition, published by Oxford University Press, 1982.
- 3. Ayurvedic Kriya Sharir Vigyan by Shiv Kumar Gord.

# Reference Books:

- 1. W.F. Ganong, Review of Medical Physiology, Thirteenth Edition, published by Appleton &Lange, U.S.A., 1987.
- 2. A.J. Vander, J.H. Sherman and D.S. Luciano, Human Physiology

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SEMESTER- IV

# BPA-401 PHARMACEUTICAL ANALYSIS OF AYURVEDIC DRUGS-I

T	eaching Sc	heme	Credis	Marks		Duration of	
L	T	P/D	C	Sessional	End Semester Examination	Total	End Semester Examination
3	0	0	3	40	60	100	3 hrs

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

Analytical Parameters of Ayurvedic Dosage Formulations viz. Solid, Liquid and Gaseous Formulations. Determination of different physico-chemical parameters of Solid Dosage Formulations like foreign matter, loss on drying, total ash content, acid insoluble ash, extractive values etc.

#### Unit II

Determination of different physico-chemical parameters of Liquid Dosage Formulations like Bioling Point etc. Determination of alcohol content, volatile oil content, Optical Activity and its determination.

#### **Unit III**

Determination of different physico-chemical parameters of Gaseous Dosage Formulations. Methods for analysis of raw materials and single Ayurvedic drugs.

#### **Unit IV**

Methodology to study toxicity of different Ayurvedic drug, metallic and herbal formulations. Limits for toxicity studies as per WHO guidelines for example- Mercury, lead, Arsenic.In -vivo methods for evaluation of toxicity.

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# Text Books:

- 1.A text book of 'Pharmacognosy' by R.K. Parmar, Vol.I, Edn.-I, P.Prakashan, India.
- 2. Munson JW. Pharmaceutical Analysis: Modern Methods. Part A & B. New York: MarcelDekker.

# Reference Books:

- 1. Willard HH, Merritt LL, Dean JA. Instrumental Methods of Analysis. New Delhi: CBS Publishers.
- 2. Ewing GW. Instrumental Methods of Chemical Analysis. Singapore: McGraw Hill.
- 3. Schirmer RE. Modern Methods of Pharmaceutical Analysis. Vol 1 & 2. Pennsylvania: FranklinBook Co. 11, ERSITY, HIMACHAE PRADESH

4. Kemp W. Organic Sepctroscopy: London: ELBS / WH Freeman & Co.

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# BPA-411 P PHARMACEUTICAL ANALYSIS OF AYURVEDIC DRUGS-I

T	Teaching Scheme		Credits	Marks			<b>Duration of</b>
L	1	P/D	C	Sessional	End Semester Examination	Total	End Semester
0	0	3	1	25	25	50	Examination 3 hrs

#### Note:

ATAL MEDICAL & RESEARCH Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

# List of experiments:

- To study Loss on drying of Drug.
- 2. To study foreign matter of Drug.
- 3. To study Acid Value of Oil
- 4. To study Acetyl Value of Oil.
- 5. Methods for analysis of raw materials and single Ayurvedic drugs.
- 6. To study total ash value of Drug.
- 7. To study acid insoluble ash value of Drug.
- 8. To study extractive value of Drug.
- 9. To study Iodine value of Oil.
- 10. To study acid soluble ash value of Drug.

#### **Text Books:**

- 1. A text book of 'Pharmacognosy' by R.K. Parmar, Vol.I, Edn.-I, P. Prakashan, India.
- 2. Munson JW. Pharmaceutical Analysis: Modern Methods. Part A & B. New York: Marcel Dekker

# Reference Books:

- 1. Willard HH, Merritt LL, Dean JA. Instrumental Methods of Analysis. New Delhi: CBS Publishers.
- 2. Ewing GW. Instrumental Methods of Chemical Analysis. Singapore: McGraw Hill.
- 3. Schirmer RE. Modern Methods of Pharmaceutical Analysis. Vol 1 & 2. Pennsylvania: FranklinBook Co.
- 4. Kemp W. Organic Sepctroscopy: London: ELBS / WH Freeman & Co.

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# **BPA-402 PHARMACOLOGY**

Te	aching Sc	heme	Credits	Credits Marks				
L	Т	P/D	С	Sessiona 1	End Semester Examination	Total	Duration of End Semester	
3	0	0	3	40	60	100	Examination 3 hrs	

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

Haematological Diseases: Iron deficiency, megaloblastic anemia (Vit B12 and folic acid), sickle cell anemia, thalasemia, hereditary acquired anemia, hemophilia.

#### Unit II

Inflammatory bowel diseases, jaundice, hepatitis (A,B,C,D,E,F) alcoholic liver disease.

#### Unit III

Sexually transmitted diseases: AIDS, Syphilis, Gonorrhea

#### **Unit IV**

Ayurvedic concept of skin disorders Acne, leprosy, vitiligo, bone and joint disorders. Ayurvedic and modern concepts of peripheral neuropathy.

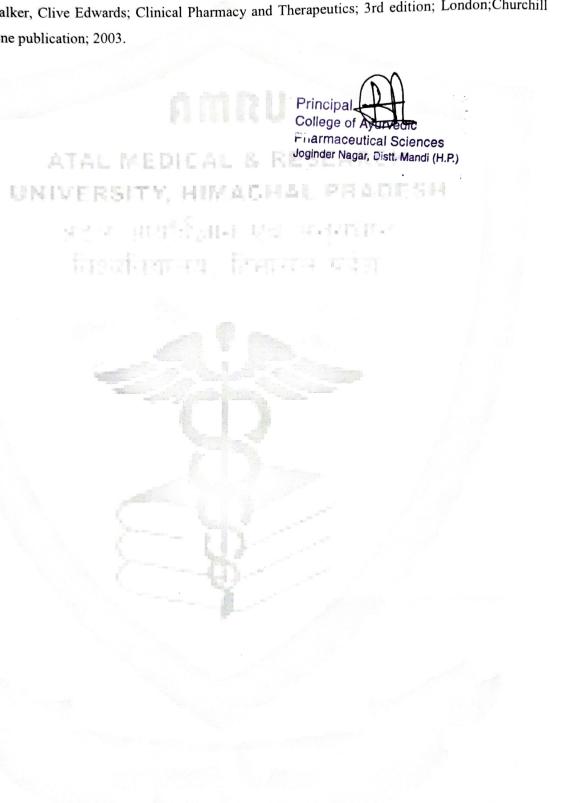
#### **Text Books:**

- 1. V. Kumar, R. S. Cotran and S. L. Robbins; Basic Pathology; 6th edition; Philadelphia; WB Saunders Company; 1997
- 2. Vinay Kumar, Abul K. Abas, Jon C. Aster; Robbins &Cotran Pathologic Basis ofDisease; South Asia edition; India; Elsevier; 2014.
- 3. HarshMohan; Text book of Pathology; 6th edition; India; Jaypee Publications; 2010.
- 4. A book of Clinical Pharmacology- R Kumar

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#### Reference Books

1. Roger Walker, Clive Edwards; Clinical Pharmacy and Therapeutics; 3rd edition; London; Churchill Livingstone publication; 2003.



## BPA-403 PHARMACOGNOSY OF AYURVEDIC DRUGS-II

T	Teaching Scheme			Teaching Scheme Credits Marks						<b>Duration of</b>
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination			
2	0	0	2	40	60	100	3 hrs			

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

# Study of biological source, chemical constituents and uses of secondary metabolites a) Alkaoids present in:-

Vasaka, Datura, Indrayava, Arkapatri, Kutaja, Soma (Ephedra), Patha, Puga, Maricha, Vatsanabha, Ativisha, Ahiphena, Punarnava, Shankhapuspi, Sarpagandha and Daruharidra.

# b) Volatile oils aromatic oils/Resin/Resin Combinations Present in -

Musta, Kulanjana, Kushtha, Ardraka, Haridra, Trivrit, Vijaya, Indravaruni, Vidanga, Kampillaka, Nagakesara, Guggulu, Shallaki, Sarala, Sarjarasa and Hingu.

c) Fixed oils and Waxes Present in – Eranda, Tila, Karanja, Jyotishmati, Madhucchishta (beeswax).

#### **Unit II**

Evaluation of the crude drugs including Physical, Chemical, Biological evaluation and Factors affecting herbal drug Constituents including authentication, environment, time of harvesting, pesticides etc.

#### **Unit III**

Cocept of Immunity and brief introduction to Rasayana including its classification and important examples, Natural Pesticides and Allergens (inhalants, infectants, ingestants, injectants etc.). Brief concept of Aromatherapy.

#### **Unit IV**

#### Quantitative microscopy

Camera lucida drawings-Concept of Vein-islet number, Vein termination number, Palisade ratio, Stomatal Number, Stomatal index, Measurement (Micrometery) of elements like Trichomes,

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Crystals, Xylem vessel, Fiber etc.

#### **Text Books:**

- 1. A text book of 'Pharmacognosy' by R.K. Parmar, Vol.I, Edn.-I, P.Prakashan, India.
- 2. Kokate CK, Gokhale SB, Purohit AP: Parmacognosy 36<sup>th</sup> edn. Nirali Prakashan, Pune, India.

# Reference Books:

- 1. Evans WC (3002): Trease and Evan's Pharmacognosy. 15<sup>th</sup>edn., Saunder' Elsevier Pvt Ltd.New Delhi-24, India.
- 2. Quality Standards of Indian Medicinal Plants. New Delhi: ICMR.
- 3. Medicinal Plants of India. New Delhi: ICMR.
- 3. S.S HandaTextbook of Pharmacognosy Vallabh Publications, New Delhi

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# BPA-412 P PHARMACOGNOSY OF AYURVEDIC DRUGS-II

T	Teaching Scheme			Marks		<b>Duration of</b>	
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

Practical's as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

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# List of experiments

- 1. To draw a square of I mm using micrometer.
- 2. To study focusing of camera lucida.
- 3. To identify various types of stomata of few drugs listed in the theory.
- 4. To identify various types of trichomes few drugs listed in the theory.
- 5. To carry out Stomatal Number and Stomatal Index of Datura.
- 6. To carry out Vein-islet Number of Vasaka and Datura.
- 7. To carry out Morphology study of Gunja, Madhucchishta.
- 8. To carry out Morphology study of Ardraka, Daruharidra
- 9. To carry out T.S. Microscopy of Vasaka, Datura leaves. etc.(drug available)
- 10. To carry out T.S. Microscopy of Maricha.
- 11. Study of Plant cells contents starch, calcium oxalate and calcium carbonate crystals.
- 12. To carry out extraction of volatile oils listed in the theory.
- 13. To prepare chemomicroscopic reagents like Glycerine-water, safranin, sudan -iii, phloroglucinol, iodine water, chloral hydrate solution etc

#### **Text Books:**

- 1. A text book of 'Pharmacognosy' by R.K. Parmar, Vol.I, Edn.-I, P.Prakashan, India.
- 2. Kokate CK, Gokhale SB, Purohit AP: Parmacognosy 36<sup>th</sup> edn. Nirali Prakashan, Pune,India.

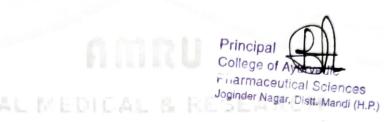
# Reference Books:

1. Evans WC (3002): Trease and Evan's Pharmacognosy. 15<sup>th</sup>edn., Saunder' Elsevier Pvt Ltd.New Delhi-24, India.

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- 2. Quality Standards of Indian Medicinal Plants. New Delhi: ICMR.
- 3. Medicinal Plants of Himachal Pradesh by Dr. N.S. Chauhan Minerva Publications.
- 4. S.S HandaTextbook of Pharmacognosy Vallabh Publications, New Delhi.



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# **BPA-404 PHARMACEUTICS - PRINCIPLES OF PHARMACEUTICAL OPERATIONS**

T	Teaching Scheme			Teaching Scheme Credits Marks					Duration of
L	T	P/D	С	Sessiona 1	End Semester Examination	Total	End Semester Examination		
3	0	0	3	40	60	100	3 hrs		

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit-I

#### a) Introduction

Fundamental principles/laws, simple cases of material and energy balances applied on single units, unit conversions.

#### b) Mixing of Solids:

Mechanism of mixing in solids, factors influencing mixing, classification of solid mixing equipments Double cone blender, Ribbon blender, Sigma blade mixer, Planetary mixer.

#### Unit-II

#### a)Filtration

Process and application of filtration, Mechanism, Theory of filtration, classification of filtration equipments, principle, construction, working, use of Plate and frame filter press, Rotary drum filters, Meta filters.

#### b) Centrifugation

Application, theory of centrifugation, classification of centrifuges, principle, construction, working, use of Perforated and non perforated basket centrifuge, Semi continuous centrifuge, super centrifuge.

#### **Unit-III**

#### a) Evaporation

Application, evaporation process, factors affecting evaporation, classification of evaporators.

Theory of evaporation, heat transfer coefficient, material and energy balance.

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**Equipments:-**Principle, construction, working and use of evaporating pan, Horizontal, vertical tube evaporator, rising film, falling film, forced circulation evaporators, multiple effect evaporators.

#### **Unit-IV**

#### a) Heat transfer

Application, mechanism of heat flow(Conduction, convection and radiation), principle, construction, working, use of shell tube heat exchanger, double pipe heat exchanger, liquid to liquid interchanger.

b) Materials for pharmaceutical plant construction: Factors affecting the choice for selection of material, classification of material for plant construction.

Text Books: Recent editions of the following books to be referred

- 1. Lachman L, Lieberman HA, Kanig JL. The Theory and Practice of Industrial Pharmacy. Philadelphia: Lea & Febiger.
- 2. Subhramanyam CVS. Pharmaceutical Engineering. New Delhi: Vallabh Prakashan.

#### Reference Books:

- **1.** McCabe WL, Smith JC, Harriolt P. Unit Operations of Chemical Engineering.London:McGraw Hill.
- 2. Badger WL, Banchero JT. Introduction to Chemical Engineering. London: McGraw Hill.
- 3. Brown CG. Unit Operations. New Delhi: CBS Publishers.

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# BPA-405 RAS SHASTRA - III

Te					Credits	Marks			Duration of
	1	P/D	C	Sessional	End Semester Examination	Total	End Semester		
3	0	0	3	40	60	100	Examination 3 hrs		

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks. Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

# Unit I

# a) Maharasa

Identification, synonyms, occurence, properties, grahya-agrahya lakshna, samanya-vishesh shodhana, marana, dose, therapeutic uses and phamacopoieal standards of bhasma of following maharasa: Abhraka, Vaikranta, Makshika, Vimala, Shilajatu, Sasyaka, Chapala and Rasaka.

# b) Uparasa

Identification, synonyms, occurrence, properties, grahya-agrahya lakshna, samanya-vishesh shodhana, marana, dose, therapeutic uses and phamacopoieal standards of bhasma of following uprasa: Gandhaka, Gairaika, Kasisa, Kanksi, Haratala, Manahsila, Anjana and Kankustha.

#### Unit II

#### Sadharana Rasa

Identification, synonyms, occurrence, properties, grahya-agrahya lakshna, samanya-vishesh shodhana, marana, dose, therapeutic uses and phamacopoieal standards of bhasma of following sadharana rasa: Kampillaka, Gauri Pashana, Navasadara, Kaparda, Mrddarasrnga, Agnijara, Giri Sindura and Hingula.

#### Unit III

#### Dhatu

Identification, synonyms, occurence, properties, grahya-agrahya lakshna, samanya-vishesh shodhana, marana, dose, therapeutic usesand phamacopoieal standards of bhasma of following: Suddha Loha: Swarna, Rajata, Tamra, Loha, Mandura, Putiloha: Naga, Vanga, Yashada, Mishra Loha: Kamsya, Pittala, Varta Loha.

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#### **Unit IV**

# Ausadhi Yoga Gyanam

Ingredients, manufacturing process, therapeutic doses and therapeutic uses of followings compound formulations: Arogya Vardhini gutika, Karpura rasa, Kasturi bhairava rasa, Kumara kalyana rasa, Garbhapala rasa, Candraprabha vati, Candramrta rasa, Pratapalankeswara rasa, Pravala Pancamrta rasa, Anandbhairava rasa, Yogendra rasa, Rajamrganka rasa, Rambana rasa, Laxmivilasa rasa, Vasanta Kusumakara rasa.

#### **Text Books:**

1. Text book of Rasa Shastra by Dr. K.Ramachandra Reddy, Chaukhamba Sanskrit Bhawan ,Varanasi

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- 2. Text Book of Rasa Shastra by Dr. Siddhinandana Mishra ,Chaukhamba Sanskrit Bhawan, Varanasi
- 3. Text book Nutan Ayurvediya Rasa Shastra by Dr. Santosh Kumar Mishra, Chakhambha Orientalia, Varanasi

#### Reference Books:

- 1. The Drugs & Cosmetics Act 1940.
- 2. The Ayurvedic Formulary of India, Part-I&II Govt. Of India Publication.
- 3. The Ayurvedic Pharmacopoeia of India Part-II, Govt. of India Publication.
- 4. Ayurved Sara Sangraha.
- 5. Rasa Tantra Sara avum Siddha Prayog Sangraha, Sri Krishan Gopal Bhawan Kaleda, Rajasthan.

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#### BPA-413 P

Te	Teaching Scheme Credits Marks						Duration of
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

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# List of experiments:

- 1. To study the Shodhana process of Makshik.
- 2. To study the Shodhana process of Shilajatu.
- 3. To study the Shodhana process of Sasyaka.
- 4. To study the Shodhana process of Gandhaka.
- 5. To study the Shodhana process of Gairika.
- 6. To study the Shodhana process of Kasisa.
- 7. To study the Shodhana process of Kankshi.
- 8. To study the Shodhana process Kapardika.
- 9. To study the Shodhana process of Hingula.
- 10. To prepare the Bhasma of Kapardika.

#### **Text Books:**

- 1. Text book of Rasa Shastra by Dr. K.Ramachandra Reddy, Chaukhamba Sanskrit Bhawan ,Varanasi
- 2. Text Book of Rasa Shastra by Dr. Siddhinandana Mishra ,Chaukhamba Sanskrit Bhawan, Varanasi
- 3. Text book Nutan Ayurvediya Rasa Shastra by Dr. Santosh Kumar Mishra, Chakhambha Orientalia, Varanasi

#### Reference Books:

- 1. The Drugs & Cosmetics Act 1940.
- 2. The Ayurvedic Formulary of India, Part-I&II Govt. of India Publication.
- 3. The Ayurvedic Pharmacopoeia of India Part-II, Govt. of India Publication.

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4. Ayurved Sara Sangraha.

5. Rasa Tantra Sara avum Siddha Prayog Sangraha, Sri Krishan Gopal Bhawan Kaleda, Rajasthan.

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## BPA-406 DRAVYA GUNA VIGYAN - III

T	eaching Sch	ieme	Credits	Marks			<b>Duration of</b>
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
2	0	0	2	40	60	100	3 hrs

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit-I

Introduction, Guna, Karma and uses of following jantavadravya (drugs of animal origin).

1. Kasturi 2. Gorochana 3.Gandhamarjaravirya 4. Mrigasringa 5. Bhunaga 6.Mukta7. Pravala

ineminara inema uca

8. Shankha 9.Shukti10. Shambuka 11. Varatika 12.Indragopa

Introduction, knowledge of guna-karma of following groups of Annapanavarga:-1. JalaVarga

DugdhaVarga 3. MadhuVarga4. IkshuVarga 5. TailaVarga 6. MadyaVarga

#### **Unit-II**

Brief information about important Nighantus.

Detailed knowledge of following drugs with respect to Basonym of drug, Main Synonyms, Regional Name, Botanical Name, Family, classification of Dravya (Gana) as described in Charak, Sushrut and Bhavaprakasha i.e. Habit and habitat/varieties, Externalmorphology, Useful parts, Important phytoconstituents, Rasa panchaka, Action on Dosha, Dhatu, Mala, Therapeutic indications, Amayikaprayoga and Matra (Therapeuticadministration and Dose), Name of important formulations, Adverse effects, remedialmeasures and Shodhana (as required)1. Hingu 2. Jambu 3 Jatamamsi 4. Jatiphala 5.Jeerakadvaya 6. Jyotishmati 7. Kalamegha 8.Kampillaka 9. Kanchanara 10. Kantakari 11.Kapikacchu 12. Karkatakshringi 13. Karpura 14.Katuki,15. Khadira

#### **Unit-III**

Detailed knowledge of following drugs with respect to Basonym of drug, Main Synonyms, Regional Name, Botanical Name, Family, classification of Dravya (Gana) as described in Charak, Sushrut and Bhavaprakasha

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- i.e. Habit and habitat/varieties, Externalmorphology, Useful parts, Important phytoconstituents. 1 Kiratatikta 2.Kumari 3. Kupilu 4. Kumkumkesara 5.Kushmanda 6. Lavanga 7. Kutaja 8.Lodhra
- 9. Madanaphala 10. Manjishtha 11. Maricha 12. Markandika 13. Musali 14. Musta 15. Nagakeshara

#### **Unit-IV**

Detailed knowledge of following drugs with respect to Basonym of drug, MainSynonyms, Regional Name, Botanical Name, Family, classification of Dravya (Gana) asdescribed in Charak, Sushrut and Bhavaprakasha

- i.e. Habit and habitat/varieties, Externalmorphology, Useful parts, Important phytoconstituents, Rasa panchaka, Action on Dosha, Dhatu, Mala, Therapeutic indications, Amayikaprayoga and Matra (Therapeuticadministration and Dose), Name of important formulations, Adverse effects, remedialmeasures and Shodhana (as required)
- 1. Nimba 2.Nirgundi 3. Palasha 4. Palandu 5.Pashanabheda 6. Patala 7. Patola 8. Pippali-pippalimula
- 9. Punarnava 10. Rasna 11. Chakramarda 12. Champaka 13. Chirbilva 14. Chopachini 15. Dattura
- 16. Darbha 17.Dhanvayasa 18. Dronapushpi 19. Gandhaprasarini 20.Garjara 21. Gojihva, 22. Gorakshaganja 23.Gunja 24. Hinstra 25. Hrutpatri 26.Indravaruni 27. Ingudi 28. Irimeda 29.Isvari 30. Japa.

#### Text books

- 1. Dravyaguna vijana by Dr. Mansi Deshpandey, Chaukhamba Sanskrit Pratisnthana, New Delhi.
- 2. Dravyaguna vijana Vol 1-5 by Prof.Sharma P.V; published by Chaukhambha Bharti Academy, Varanasi.

#### Reference Books

- 1. The Wealth of India Publication and Directorate (CSIR, New Delhi)
- 2. Database on medicinal plants used in Ayurveda by CCRAS, New Delhi.

3. Indian Medicinal Plants by K.R.Kirtikar and B.D.Basu.

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# BPA-414P DRAVYA GUNA VIGYAN - III

T	eaching Scl	neme	Credits	Marks		The Laterage	<b>Duration of</b>
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
0	0	3	1	25	25	50	3 hrs

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#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class.

- 1. Knowledge of identification of drugs mentioned in theory
- 2. Collection of minimum 50 herbarium specimen from outside state.
- 3. Compilation of a drug not less than 25 pages

#### **Text Books-**

- 1. Dravyaguna vijana by Dr. Mansi Deshpandey, Chaukhamba Sanskrit Pratisnthana, New Delhi.
- 2. Dravyaguna vijana Vol 1-5 by Prof. Sharma P.V; published by Chaukhambha Bharti Academy, Varanasi.

#### Reference Books:

- 1. The Wealth of India Publication and Directorate (CSIR, New Delhi)
- 2. Database on medicinal plants used in Ayurveda by CCRAS, New Delhi.
- 3. Medicinal Plants of Himachal Pradesh by Dr. N.S. Chauhan Minerva Publications.

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# **BPA-515: INDUSTRIAL TRAINING**

L	T	P	Credits,	
			assigned	
-	-	- 1	2	

# ATAL MEDICAL & RESEARCH

Industrial training of Thirty days (30) is to be satisfactorily completed before a student is declared eligible for the degree. Normally industrial training will be arranged at the end of 4<sup>th</sup> semester either in one stretch or two stretches during end semester vacations.

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SEMESTER- V

# **BPA-501 PHARMACOGNOSY-II**

	T	eaching Sc	heme	Credits	Marks	44		Duration of
	L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
1	2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

- a) Study of cultivation, collection, substitutes, adulterants, diagnostic macroscopic and microscopic features and phytochemical tests for identity of drugs -Glycyrrhiza, Digitalis, Aloe, Senna and Datura.
- b) Study of botanical sources including alternative names, chemical constituents and therapeutic uses of the following indigenous traditional Drugs: Amla, Behera, Harad, Ashwagandha, Babchi, Brahmi, Vasaka, Bach, Tulsi, Shatavar, Shankhpushpi, Kutaki, Kalmegh, Gokhru, Chirata, Ashoka, Jatamansi, Kuth and Gilo.

#### **Unit II**

Study of the biological sources, chemical constituents and uses of drugs - Alkaloid Containing Drugs:--a. Pyridine- piperidine group: Tabacco, Areca and Lobelia.b. Tropane group: Belladonna, Hyoscyamus, Coca. c. Quinoline, isoquinoline group: Ipecac, Cinchona and Opium.

d.Imidazole group: Pilocarpus.e. Steroidal group: Veratrum, Kurchi Bark and Guggulu.

f. Alkaloidal amine group: Ephedra and Colchicumg. Saponin containing drugs: Senega, Dioscoreah. Cardioactive drugs: Squill, Strophanthus, Thevetia. iAnthraquinone cathartics: Rhubarb and Cascaraj. Volatile Oils: Rose oil, lavender oil, patchouli oil, sandalwood oil, lemongrass oil, orange oil, jasmine oil, geranium oil.

Unit III: Concept of Adulteration including its types and detection methods and Study of

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Adulterants in the following drugs-Orange peel, cinnamon, nutmeg, eucalyptus, cardamom, fennel, Kuth and clove. A brief introduction to basic food laws in india and FSSAI.

**Unit IV:** Concept of heavy metal toxicity in Ayurvedic drugs and methods for measuring the toxicity, plant adaptogens (history, definition and examples), Anticancer plants with examples. Some traditional recepies/food of Himachal Pradesh.

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#### Text Books:

- 1. A text book of 'Pharmacognosy' by R.K. Parmar, Vol.I, Edn.-I, P.Prakashan, India.
- 2. S.S HandaTextbook of Pharmacognosy Vallabh Publications, New Delhi.

#### Reference Books:

1. Evans WC (3002): Trease and Evan's Pharmacognosy. 15th edn., Saunder' Elsevier Pvt Ltd. NewDelhi-

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- 24, India.
- 2. Quality Standards of Indian Medicinal Plants. New Delhi: ICMR.
- 3. Medicinal Plants of Himachal Pradesh by Dr. N.S. Chauhan Minerva Publications.

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# BPA-502 PHARMACEUTICAL ANALYSIS OF AYURVEDIC DRUGS - II

T	eaching Scl	heme	Credits	Credits Marks			<b>Duration of</b>
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

Introduction of U.V. and Visible spectrophotometry with their application in the Ayurvedic Pharmaceutical Industry and how they are helpful in the growing industry of the Ayurveda, Principle, Instrumentation of U.V. and Visible spectrophotometry.

#### Unit II

Introduction to Infrared Spectrophotometry with their sample prepration by different technique and detector used in I.R.Spectrophotometry and qualitative and quantitative applications in the field of the Ayurvedic Pharmacy.

#### **Unit III**

Introduction of Chromatography-History, Chromatography terms, Techniques by Chromatographic bed shape, Displacement Chromatography, Techniques by physical state of mobile phase, Techniques by separation Mechanism, Special Techniques.

#### **Unit IV**

Use of Chromatographic & Spectrophotometric methods for Standardization and evaluating quality of Ayurvedic Drugs and instrumental Analysis. Application, merits, demerits of Chromatographic & Spectrophotometric methods.

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#### Text Books:

- 1. Kemp W. Organic Sepctroscopy: London: ELBS / WH Freeman & Co.
- **2.** Munson JW. Pharmaceutical Analysis: Modern Methods. Part A & B. New York: MarcelDekker

# Reference Books:

- 1. Willard HH, Merritt LL, Dean JA. Instrumental Methods of Analysis. New Delhi: CBS Publishers.
- 2. Ewing GW. Instrumental Methods of Chemical Analysis. Singapore: McGraw Hill.
- 3. Schirmer RE. Modern Methods of Pharmaceutical Analysis. Vol 1 & 2. Pennsylvania: FranklinBook Co.
- 4. A text book of 'Pharmacognosy' by R.K. Parmar, Vol.I, Edn.-I, P.Prakashan, India.

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#### BPA-511 P

# PHARMACEUTICAL ANALYSIS OF AYURVEDIC DRUGS - II

1	Teaching Scheme			Marks	1018.2.		<b>Duration of</b>
L	Т	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

Practical's as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

- 1. To find out R<sub>f</sub> value of different single and compound drugs by TLC method.
- 2. To determine paper chromatography of different single or compound drugs/formulations.
- 3. To determine Melting point of sulphur, borax.
- 4. To determine pH of different single or compound drugs/formulations.
- 5. To prepare standard solution.
- 6. To find out the Refractive index of different single or compound drugs/formulations.
- 7. To prepare solvent system for of different single or compound drugs/formulations.
- 8. To establish primary parameter of Ayurvedic Drugs as per API.
- 9. To compare standard graph of single or compound Ayurvedic drugsUV.
- 10. To find out optical rotation of single or compound Ayurvedic drugs sample.

#### **Text Books:**

- 1. Kemp W. Organic Sepctroscopy: London: ELBS / WH Freeman & Co.
- 2. Munson JW. Pharmaceutical Analysis: Modern Methods. Part A & B. New York: MarcelDekker

#### Reference Books:

- 1. Willard HH, Merritt LL, Dean JA. Instrumental Methods of Analysis. New Delhi: CBS Publishers.
- 2. Ewing GW. Instrumental Methods of Chemical Analysis. Singapore: McGraw Hill.
- 3. Schirmer RE. Modern Methods of Pharmaceutical Analysis. Vol 1 & 2. Pennsylvania: FranklinBook Co.
- 4. A text book of 'Pharmacognosy' by R.K. Parmar, Vol.I, Edn.-I, P.Prakashan, India.

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# BPA-503 PHARMACEUTICAL TECHNOLOGY FOR AYURVEDIC DRUGS-I

To	eaching Sc	heme	Credits	Marks	Mary		<b>Duration of</b>
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may asked to attempt only 1

question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit-I

#### a.) Ophthalmic preparations:

Introduction, formulation considerations; formulation of eyedrops, eye ointments and eye lotions; methods of preparation; labeling, containers; evaluation of ophthalmic preparations, contact lens solutions.

**b.)Packing of pharmaceutical products:** Packaging components, types, and stability aspects of packaging, factors influencing choice of containers of packaging, evaluation of packaging.

#### Unit-II

- **a.)** Cream: Introduction, Application, Classification, techniques used for formulation of pharmaceutical cream, evaluation of cream.
- **b.)Preservatives:** Preservatives (Antioxidants and antimicrobial agents) used in pharmaceutical preparation with their concentration.

#### Unit-III

#### a.) Tablet:

Formulation and classification of different types of tablets, methods of formulation process of tablet (granulation), In-process quality control testing of tablets.

b.) Tablet coating: Types of coating, equipments for coating, coating process, evaluation tests for coating tablets.

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#### **Unit-IV**

# Capsules:-Hard gelatin, Soft gelatin

Advantages and disadvantages of capsule dosage form, material for production of hard gelatin capsules, size of capsules, method of capsule filling, soft gelatin, capsule shell and capsule content, quality control testing of capsule and storage of capsule dosage forms.

Text Books: Recent editions of the following books to be referred

- 1. Lachman L, Lieberman HA, Kanig JL. The Theory and Practice of Industrial Pharmacy.
- 2. Ansel HC. Introduction to Pharmaceutical Dosage Forms. Mumbai: Verghese & Co.
- 3. Thakur R. Tabular Pharmaceutics, Vol. I, Edn. I Pranav Prakashan H.P.

#### Reference Books:

**1.** Aulton ME. Pharmaceutics-The Science of Dosage Form Design. London: ELBS/ChurchillLivingstone.

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- 2. Banker GS, Rhodes CT. Modern Pharmaceutics. New York: Marcel Dekker.
- 3. Rawlins EA. Bentley's Textbook of Pharmaceutics. London: ELBS.

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# BPA-512P PHARMACEUTICAL TECHNOLOGY FOR AYURVEDIC DRUGS-I

Te	Teaching Scheme			Credits Marks			<b>Duration of</b>
L	T	P/D	C	Sessional	End Semester Examination	Total	End Semester Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

ATAL MEDICAL & RESEARCH

# List of experiments:

- 1. Preparation and evaluation of granules by wet Granulation techniques.
- 2. Preparation, dispense and evaluation of Herbal Cream.
- 3. Filling of Ayurvedic capsule by Hand operated capsule filling machine.
- 4. To determine the Weight variation of Ayurvedic tablets.
- 5. To determine the friability of Ayurvedic tablets by Roche friabilator apparatus.
- 6. To determine the disintegration time of Ayurvedic tablets.
- 7. To determine the Weight variation of Ayurvedic capsules.
- 8. To determine the disintegration time of Ayurvedic capsules.
- 9. To determine the Hardness of Ayurvedic tablets by Monsanto hardness tester.
- 10. To prepare and dispense ointment.

#### Text Books: Recent editions of the following books to be referred

- 1. Lachman L, Lieberman HA, Kanig JL. The Theory and Practice of Industrial Pharmacy.
- 2. Ansel HC. Introduction to Pharmaceutical Dosage Forms. Mumbai: Verghese & Co.

#### Reference Books:

- **1.** Aulton ME. Pharmaceutics-The Science of Dosage Form Design. London: ELBS/ChurchillLivingstone.
- 2. Banker GS, Rhodes CT. Modern Pharmaceutics. New York: Marcel Dekker.
- 3. Rawlins EA. Bentley's Textbook of Pharmaceutics. London: ELBS.

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BPA-504 DRAVYAGUNA VIGYANA – IV

T	eaching Scl	ieme	Credits	Marks			<b>Duration of</b>
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only I question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer

#### Unit-I

type questions and shall be of 20 marks.

Controversial aspects of Ayurvedic Drugs Knowledge of TKDL, IPR, Publications and related issues. Brief knowledge about WHOs "Essential Drug List"

Knowledge about Pharmaco vigilance (ADR) in Ayurveda and conventional system of medicine.

#### **Unit-II**

Detailed knowledge of following drugs with respect to Basonym of drug, Main Synonyms, Regional Name, Botanical Name, Family, classification of Dravya (Gana) as described in Charak, Sushrut and Bhavaprakasha i.e. Habit and habitat/varieties, External morphology, Useful parts, Important phytoconstituents, Rasa panchaka, Action on Dosha, Dhatu, Mala, Therapeutic indications, Amayikaprayoga and Matra (Therapeutic administration and Dose), Name of important formulations, Adverse effects, remedial measures and Shodhana (as required)

- 1. Vidari 2. Vidanga 3. Yastimadhu 4. Yavani 5. Devadaru 6. Jati 7. Jayapala 8. Jeevanti
- 9. Kadali, 10.Kadamba 11. Kaidarya 12. Kamala 12.Kankola 13. Kakamachi 14. Karanja 15.Karira 16. Karpasa 17. Karavira 18.Karavellaka 19. Kasha 20. Kasni 21.Kataka 22. Katphala 23. Kharjura 24.Kitmari

#### **Unit-III**

Detailed knowledge of following drugs with respect to Basonym of drug, Main Synonyms, Regional Name, Botanical Name, Family, classification of Dravya (Gana) as

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described in Charak, Sushrut and Bhavaprakasha i.e. Habit and habitat/varieties, External morphology, Useful parts, Important phytoconstituents, Rasa panchaka, Action on Dosha, Dhatu, Mala, Therapeutic indications, Amayikaprayoga and Matra (Therapeutic administration and Dose), Name of important formulations, Adverse effects, remedial measures and Shodhana (as required) 1.Rasona 2. Saireyaka 3. Shallaki 4.Saptaparna 5. Sarpagandha 6. Sariva 7.Shalaparni 8. Shalmali 9. Shankhapushpi 10.Shatavari 11. Shathapushpa 12. Shigru 13.Shirisha 14. Shyonaka 15. Thalisapatra 16.Tila 17. Trivrut 18. Tulasi 19.Tvak 20. Ushira 21. Vacha 22.Varuna 23. Vasa 24. Vata 25.Vatsanabha

#### **Unit-IV**

Detailed knowledge of following drugs with respect to Basonym of drug, Main Synonyms, Regional Name, Botanical Name, Family, classification of Dravya (Gana) as described in Charak, Sushrut and Bhavaprakasha i.e. Habit and habitat/varieties, External morphology, Useful parts, Important phytoconstituents, Rasa panchaka, Action on Dosha, Dhatu, Mala, Therapeutic indications, Amayikaprayoga and Matra (Therapeutic administration and Dose), Name of important formulations, Adverse effects, remedial measures and Shodhana (as required)

- 1. Koshataki 2. Kokilaksha 3.Kumuda4. Kusha 5. Lajjalu 6.Langali 7. Latakaranja
- 8. Latakasturi 9.Madayantika 10. Mahanimba 11. Mandukaparni 12.Mashaparni
- 13. Mayaphala 14. Methika 15.Meshashrungi 16. Mudgaparni 17. Mulaka 18.Nagabala 19. Nala 20. Narikela

#### **Text Books**

- Dravyaguna vijana by Dr. Mansi Deshpandey, Chaukhamba Sanskrit Pratisnthana, New Delhi.
- 2. Dravyaguna vijana Vol 1-5 by Prof.Sharma P.V;published by Chaukhambha Bharti Academy,Varanasi.

#### **Reference Books:**

- 1. The Wealth of India Publication and Directorate (CSIR,New Delhi)
- 2. Database on medicinal plants used in Ayurveda by CCRAS,New Delhi.

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# BPA-513 P DRAVYAGUNA VIGYANA – IV

	Teac Scho	ching eme	Credit	Marks			Duration of End
L	T	P/D	С	Sessional	End Semester Examination	Total	Semester Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class.

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- 1. Knowledge of identification of drugs mentioned in theory
- 2. Collection of minimum 30 herbarium specimen from field visit.
- 3. Compilation of a drug not less than 25 pages

#### **Text Books-**

- Dravyaguna vijana by Dr. Mansi Deshpandey, Chaukhamba Sanskrit Pratisnthana, New Delhi.
- 2. Dravyaguna vijana Vol 1-5 by Prof.Sharma P.V; published by Chaukhambha BhartiAcademy, Varanasi.

#### Reference Books:

- 1. The Wealth of India Publication and Directorate (CSIR, New Delhi) 2.Database on medicinal plants used in Ayurveda by CCRAS, New Delhi. 3. Indian Medicinal Plants by K.R.Kirtikar and B.D.Basu
- 4. Medicinal Plants of Himachal Pradesh by Dr. N.S. Chauhan Minerva Publications.

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T	eaching Sch	eme	Credits	Marks	- Calput		<b>Duration of</b>
L	T P/D	С	Sessional	End Semester Examination	Total	End Semester Examinatio	
3	0	0	3	40	60	100	3 hrs

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks. Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

#### a) Ratna

Identification, synonyms, occurence, properties, grahya-agrahya lakshna, samanya-vishesh shodhana, marana, dose, therapeutic uses and phamacopoieal standards of bhasma of following ratna: Manikya, Mukta, Pravala, Tarksya, Pusaparaga, Vajra, Nilam, Gomeda, Vaidurya.

# b) Uparatna

Identification, synonyms, occurrence, properties, grahya-agrahya lakshna, samanya-vishesh shodhana, marana, dose, therapeutic usesand phamacopoieal standards of bhasma of following upratna: Suryakanta, Candrakanta, Rajavarta, Pairojaka, Sphatikamani, Trnakanta, Palanaka, Puttika, Rudhira.

#### Unit II

#### a) Sudha varga

Identification, synonyms, occurrence, properties, grahya-agrahya lakshna, samanya-vishesh shodhana, marana, dose, therapeutic uses and phamacopoieal standards of bhasma of following drugs of sudha varga: Sudha, Sukti, Sankha, Badarasma, Mrigasrnga, Khatika, Godanti, Samudraphena, Kukkutand twak.

#### b) Sikta varga

Identification, synonyms, occurrence, properties, grahya-agrahya lakshna, samanya-vishesh shodhana, marana, dose, therapeutic uses and phamacopoieal standards of bhasma of following drugs of sikta varga: Sikta, Dugdhapasana, Nagapasana, Vyomasma, Sange Yeshab, Kouseyasma, Akika.

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#### **Unit III**

# a) Ksara Varga

Identification, synonyms, occurrence, properties, grahya-agrahya lakshna, samanya-vishesh shodhana, marana, dose, therapeutic uses and phamacopoieal standards of following ksara: Sarja ksara, Yava ksara, Tankana Ksara, Surya Ksara.

# b) Visha and Upavisha

Introduction, collection and storage, classification, synonyms, Shodhana, antidote, therapeutic and toxic doses, therapeutic uses and formulations of following visha and upavisha: Vatsanabha, kuchala, jayapala, Dhatturabija, Bhang, Bhallataka, Gunja, Arka, Snuhi, langali, Karavira, Ahiphena, Chitrakamula.

#### **Unit IV**

- a) Brief Knowledge of standardisation of Rasausadhis.
- b) Concept of Pharmacovigilance and its status in India with reference to Ayurvedic drugs.

#### **Text Books:**

- 1. Text book of Rasa Shastra by Dr. K.Ramachandra Reddy, Chaukhamba Sanskrit Bhawan ,Varanasi
- 2. Text Book of Rasa Shastra by Dr. Siddhinandana Mishra ,Chaukhamba Sanskrit Bhawan, Varanasi
- 3. Text book Nutan Ayurvediya Rasa Shastra by Dr. Santosh Kumar Mishra, Chakhambha Orientalia, Varanasi

#### Reference Books:

- 1. The Drugs & Cosmetics Act 1940.
- 2. The Ayurvedic Formulary of India, Part-I&II Govt. of India Publication.
- 3. The Ayurvedic Pharmacopoeia of India Part-II, Govt. of India Publication.
- 4. Ayurved Sara Sangraha.
- 5. Rasa Tantra Sara avum Siddha Prayog Sangraha, Sri Krishan Gopal Bhawan Kaleda, Rajasthan.

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#### **BPA-514 P RASSHASTRA -IV**

L	T	eaching Sch	eme	Credits	Credits Marks			
	L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
L	0	0	3	1	25	25	50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

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# List of experiments:

- 1. To study the Shodhana process of Mukta.
- 2. To study the Shodhana process of Pravala.
- 3. To prepare the pisti of Pravala.
- 4. To study the Shodhana process of Shankha.
- 5. To prepare the Bhasma of Shankha.
- 6. To study the Shodhana process of Mrigshringa.
- 7. To prepare the Bhasma of Mrigshringa.
- 8. To study the Shodhana process of Kuchala.
- 9. To study the Shodhana process of Bhallataka.
- 10. To prepare Yava kshara.
- 11. To prepare Apamarga Kshara.

#### **Text Books:**

- 1. Text book of Rasa Shastra by Dr. K.Ramachandra Reddy, Chaukhamba Sanskrit Bhawan ,Varanasi
- 2. Text Book of Rasa Shastra by Dr. Siddhinandana Mishra ,Chaukhamba Sanskrit Bhawan, Varanasi
- 3. Text book Nutan Ayurvediya Rasa Shastra by Dr. Santosh Kumar Mishra, Chakhambha Orientalia, Varanasi

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#### Reference Books:

- 1. The Drugs & Cosmetics Act 1940.
- 2. The Ayurvedic Formulary of India, Part-I&II Govt. of India Publication.

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- 3. The Ayurvedic Pharmacopoeia of India Part-II, Govt. of India Publication.
- 4. Ayurved Sara Sangraha.
- 5. Rasa Tantra Sara avum Siddha Prayog Sangraha, Sri Krishan Gopal Bhawan Kaleda, Rajasthan.

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# SEMESTER- VI

#### **BPA-601**

# PHARMACEUTICAL ENGINEERING

T	eaching Scl	heme	Credits	Marks			Duration of
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may asked to attempt only 1

question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

#### Size reduction

Objectives, Mechanisms & Laws governing size reduction, factors affecting size reduction, principles, construction, working, uses, merits and demerits of Hammer mill, ball mill, fluid energy mill.

#### Size separation

Official standards for powders as per IP/API, sieves and their specifications, principle, construction, working, use of Sieve shaker machine, Cyclone separator, Airseparator, Bag filter.

#### Unit II

#### **Drying**

Application, theory of drying, bound and unbound moisture, critical and equilibrium moisturecontent, Classification of equipments including mechanism.

**Equipments:** Principle, construction, working, use of Tray dryer, Drum dryer, Spray dryer, Fluidized bed dryer (FBD), Vacuum dryer, Freeze dryer.

#### **Unit III**

#### Distillation

Basic Principles and methodology of simple distillation, flash distillation, fractional distillation, distillation under reduced pressure, & steam distillation.

#### **Unit-IV**

#### Crystallization:

Application, mechanism of crystallization, Mier's supersaturation theory, Caking of crystals, factors affecting caking and prevention of caking. Principle, construction, working, use of

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Agitated batch crystallizer, Swenson walker crystallizer, vacuum crystallizer.

Text Books: Recent editions of the following books to be referred

- 1. The Theory and Practice of Industrial Pharmacy- Lachmann, latest edition.
- 2. Pharmaceutical Engineering- Subrahmanyam CVS, latest edition.
- 3. Remington, The Science and Practice of Pharmacy- Martin, Latest edition.

# Reference Books: ATAL MEDICAL & RESEARCH

- 1. Bhatt ND, Panchal VM. Machine Drawing. Anand: Charocar Publishing House.
- 2. Badger WL, Banchero JT. Introduction to Chemical Engineering. London: McGraw Hill.
- 3. Brown CG. Unit Operations. New Delhi: CBS Publishers.

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# **BPA-602 PHARMACOLOGY & TOXICOLOGY OF AYURVEDIC DRUGS-1**

Te	Teaching Scheme			Credits Marks			
L	T P/D		С	Sessional	End Semester	Total	End Semester
					Examination		Examination
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

Pharmacology of Cardiovascular System: Digitalis and cardiac glycosides, Antihypertensive drugs, Antianginal and Vasodilator drugs including calcium channel blockers and beta adrenergic antagonists, Antiarrhythmic drugs, Antihyperlipedemic drugs, Drugs used in the therapy of shock.

#### **Unit II**

Type of drugs for the treatment of GI tract diseases. Appetizers, Digestants, carminatives, Emetics, antiemetics. Laxative & anti-diarrhoeal, Pharmacotherapy of peptic ulcer.

#### **Unit III**

Steroids and Related Drugs: ACTH, corticosteroids, Androgens and anabolic steroids, Estrogens, progesterone and oral contraceptives, Drugs acting on the uterus. Drugs Acting on Urinary System: Fluid and electrolyte balance, Diuretics.

#### **Unit IV**

General principles of clinical toxicology including insecticide poisoning, heavy metal poisoning, barbiturate poisoning, narcotic drug poisoning. Concept of animal ethical committee and its guidelines.

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#### Text Books:

- **1.** Tripathi KD. Essential of medical Pharmacology, New Delhi: Jaypee Brothers MedicalPublishers.
- 2. Ghosh MN. Fundamentals of Experimental Pharmacology. Kolkata: Scientific Book Agency.

# Reference Books:

- 1. Rang MP, Dale MM, Riter JM. Pharmacology. New York: Churchill Livingstone.
- 2. Brunton LL, Lazo JS, Parker KL. Goodman and Gilman's The Pharmacological Basis of Therapeutics. New York: McGraw Hill.
- **3.** Mycek MJ, Harvey RA, Champe PC. Lipponcott's Illustrated Reviews Pharmacology. Philadelphia: Lippincott Williams & Wilkins

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#### BPA-603 BHAISHAJYA KALPNA - II

T	eaching Scl	neme	Credits	Marks			Duration of
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
3	0	0	3	40	60	100	3 hrs

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may asked to attempt only 1

question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit-I

#### Manaparibhas

Classification of mana, payya mama, druvaya mana, putava mana, kala mana, Magadhamana, kudava patra, kalinga mana, paschatya mana paribhasa, metric system, imperial system.

#### Unit II

#### Dravya sangrahana

Collection of drugs, jangama dravya sangrahana, prayojyangas, agrahya dravyas, methods of adulteration, aushdha kalpana pariksanavidhi.

#### UniT-III

Kalpana classification, pancavidha kashaya kalpana, pancakasaya yoni, swarasa kalpana, putapaka swarasa, kalka kalpana,kwatha kalpana, saptavidha kasaya, kwatha churna, paniya kalpana, sadanga paniya, phanta kalpana, hima kalpana, usnodaka, tandulodaka, laksa rasa kalpana, mamsarasa, vesavara, mantha kalpana, ausadha siddha paniya, yusa kalpana, arka kalpana, panaka kalpana, arka kalpana, syrups, elixirs, linctuses, pramathya, phanita, rasa kriya, rasanjana, mosabbar, gudapaka, Avaleha kalpana, Ghana sattva, churna kalpana, modern aspect of churna (powders).

**Unit IV** 

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- **a)** Definitions of Ayurvedic, Siddha and Unani drugs, drug, patent or proprietary medicine, standard quality, misbranded drugs, adulterated drugs, spurious drugs, misbranded cosmetics, spurious cosmetics, adulterated cosmetics as mentioned in the Drugs and Cosmetics Act and Rules.
- b)Provisions applicable to manufacture of Ayurvedic, Siddha and Unani Drugs, technical staff, Drugs Technical Advisory Board, Ayurvedic, Siddha and Unani Drugs Consultative Committee, Labelling, packing and limit of alcohol in Ayurvedic and Unani Drugs.

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#### Text Books:

- 1. Text book of Bhaishajya Kalpana Vigyana (A Science of Indian Pharmacy) by Dr.
- K.Ramachandra Reddy, Chaukhamba.
- 2. Text Book of Bhaishajya Kalpana Vigyana by Dr. Siddhinandana Mishra, ChaukhambaSanskrit Bhawan, Varanasi.
- 3 Text book of Bhaishajya Kalpana Vigyana by Dr. Santosh Kumar Mishra, Chakhambha Orientalia, Varanasi.

#### Reference Books:

- 1. The Drugs & Cosmetics Act 1940.
- 2. The Ayurvedic Formulary of India, Part-I&II Govt. of India Publication.
- 3. The Ayurvedic Pharmacopoeia of India Part-II, Govt. of India Publication.
- 4. Ayurved Sara Sangraha.
- 5. Rasa Tantra Sara avum Siddha Prayog Sangraha, Sri Krishan Gopal Bhawan Kaleda, Rajasthan.

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#### BPA-611 P BHAISHAJYA KALPNA - II

T	Teaching Scheme			Marks			Duration of
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
0	0	3	1	25	25	. 50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

# List of experiments:

- To prepare Ardraka Swarasa.
- 2. To prepare Tulsi swarasa.
- 3. To prepare Vasa putpaka swarasa.
- 4. Preparation of Kalka.
- 5. Preparation of Kwatha.
- 6. Preparation of Hima.
- 7. Preparation of Phanta.
- 8. Preparation of Shadanga paniya.
- 9. To prepare Sitopaladi churna.
- 10. To prepare Talisadi churna.
- 11. To prepare Hingvshtaka churna.
- 12. To prepare Chyawanprasha Avaleha.
- 13. To prepare Vasa Avaleha.
- 14. To prepare Arka.
- 15. To prepare Panaka Kalpana.

#### **Text Books:**

- 1. Text book of Bhaishajya Kalpana Vigyana (A Science of Indian Pharmacy) by Dr. K.Ramachandra Reddy, Chaukhamba.
- 2. Text Book of Bhaishajya Kalpana Vigyana by Dr. Siddhinandana Mishra, Chaukhamba Sanskrit Bhawan, Varanasi.
- 3. Text book of Bhaishajya Kalpana Vigyana by Dr. Santosh Kumar Mishra, ChakhambhaOrientalia, Varanasi.

Reference Books:

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- 1. The Drugs & Cosmetics Act 1940.
- 2. The Ayurvedic Formulary of India, Part-1&II Govt. of India Publication.
- 3. The Ayurvedic Pharmacopoeia of India Part-II, Govt. of India Publication.
- Ayurved Sara Sangraha.
- 5. Rasa Tantra Sara avum Siddha Prayog Sangraha, Sri Krishan Gopal Bhawan Kaleda, Rajasthan.

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# **BPA-604 PHARMACEUTICAL MICROBIOLOGY**

10	Teaching Scheme			Credits Marks				
	Т	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination	
	0	0	2	40	60	100	3 hrs	

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

Introduction to Microbiology and microscopy: Introduction, History and Scope of Microbiology, Classification of bacteria, Structural organization of bacteria, virus and fungi, Staining techniques, Bright Field Microscopy, Dark field microscopy, Electron Microscopy.

#### Unit II

Microbial physiology and metabolism: nutritional requirements of bacteria, factors controlling growth of organism, preservation of microbes, beneficial microbes and products.

Fermentation: alcohol fermentation, design of an ideal fermenter, fermentation process

#### Unit III

Control of microbes by physical and chemical methods. Disinfection, factors influencing disinfection, disinfectants and antiseptic and their evaluation.

Sterilization, different methods, evaluation of sterilization methods. Sterility testing of Pharmaceutical products.

#### Unit -IV

Types of immunity- humoral immunity, cellular immunity, Immunoglobulins. Ayurvedic concept of immunity. Applications of microbiology in Ayurvedic Pharmacy.

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# Text Books:

- 1. Hugo and Russel. Pharmaceutical Microbiology. Oxford: Balckwell.
- 2. Pelczar PC. Microbiology. New Delhi: Tata McGraw Hill.

# Reference Books:

1. Ananthanarayan A, Panickar J. Textbook of Microbiology. Hyderabad: Orient Longman.

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- 2. Prescott LM, Harley GP, Klein DA. Microbiology. Oxford: VC Brown Publishers.
- 3. Indian Pharmacopoeia. New Delhi: Controller of Publications.

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## **BPA-612 P PHARMACEUTICAL MICROBIOLOGY**

Teaching Scheme			Credits	Marks	Marks		
L	Т	P/D	C	Sessional	End Semester Examination	Total	Duration of End Semester Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

ATAL MEDICAL & RESEARCH Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

# List of experiments:

- 1. To carry out working and Principle of Compund and Binocular microscope.
- 2. To study micrometry (draw scales)
- 3. To study working and Principle of Autoclave, hot air oven, laminar air flow, incubator etc
- 4. To prepare various types of culture media.
- 5. To study various sub-culturing of common aerobic and anaerobic bacteria, fungus and yeast
- 6. To study various isolation and identification of bacteria, fungus.
- 7. To carry out different sterilizing techniques
- 8. To prepare cotton plugs for sterilization.

#### **Text Books:**

- 1. Hugo and Russel. Pharmaceutical Microbiology. Oxford: Balckwell.
- 2. Pelczar PC. Microbiology. New Delhi: Tata McGraw Hill.

#### Reference Books:

- 1. Ananthanarayan A, Panickar J. Textbook of Microbiology. Hyderabad: Orient Longman.
- 2. Prescott LM, Harley GP, Klein DA. Microbiology. Oxford: VC Brown Publishers.
- 3. Indian Pharmacopoeia. New Delhi: Controller of Publications.

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#### **BPA-605 PHARMACOGNOSY -III**

T	Teaching Scheme			Marks	33	<b>Duration of</b>	
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

- a) Introduction to the Study of mevalonic and shikimic acid pathways with special reference to the biosynthesis of: Tropane alkaloids and Terpenoids.
- **b)** Enzymes, its classification and Study of Biological sources, preparation and uses of the following enzymes: Papain, pepsin and papereatin.

#### **Unit II**

- a) Brief introduction to plant tissue culture techniques-Micropropagation, hairy root culture, root and shoot tip culture etc. including nutritional requirements and applications of plant tissue culture.
- b) Phytochemical Screening: Preparation of extracts and Screening of alkaloids, saponins, cardiac glycosides, flavonoids, tannins and polyphenols, anthraquinones, amino acids in plant extracts

#### **Unit III**

- a) Basic introduction to different classes of plant growth regulators like auxins, cytokinins, gibberellins, abscisic acid and their physiological role.
- b) Study of Plant pesticides including rodenticides, nematicides, insecticides, fungicides. Herbs as health foods and cosmoceuticals.

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#### **Unit IV**

- a) Study and applications of TLC, paper chromatography, column chromatography, Gas, HPLC, centrifugal partition chromatography.
- **b)** Quality control of crude drugs: Adulteration of curde drugs and their detection by organoleptic, microscopic, physical, chemical and biological methods and properties.

# **Text Books:**

1. A text book of 'Pharmacognosy' by R.K. Parmar, Vol.I, Edn.-I, P.Prakashan, India.

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2. S.S HandaTextbook of Pharmacognosy Vallabh Publications, New Delhi.

3. A book of Clinical Pharmacology- R Kumar.

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#### **BPA-613 P PHARMACOGNOSY -III**

Te	Teaching Scheme			Credits Marks				
L	Т	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination	
0	0	3	1	25	25	50	3 hrs	

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

#### List of experiments

- 1. To carry out extractive value of some drugs listed in API
- 2. To carry out Refractive index of some Ayurvedic drugs listed in API.
- 3. To prepare TLC plates by various methods.
- To carry out TLC studies of some Ayurvedic drugs/formulations/volatile oils etc. listed inAPI
- 5. To carry out florescence analysis of some Ayurvedic crude drugs/extracts.
- 6. To carry out chemical test of Alkaloids.
- 7. To carry out chemical test of Steroids.
- 8. To carry out test for Saponins.
- 9. To carry out chemical test for Flavonoids.
- 10. To carry out chemical test for Tannins.
- 11. To carry out foreign matter analysis, Loss on drying, Swelling and Foaming index of somesome drugslisted in API.
- 12. To carry out isolation of volatile oil and carry out solubility test, refractive index, TLCprofile of the oil obtained camphor, eucalyptus oil.
- 13. To study different labels pertaining to Ayurvedic and Modern dosage forms.

#### **Text Books:**

- 1. A text book of 'Pharmacognosy' by R.K. Parmar, Vol.I, Edn.-I, P.Prakashan, India.
- 2. Kokate CK, Gokhale SB, Purohit AP: Parmacognosy 36th edn. Nirali Prakashan, Pune, India.

#### Reference Books:

1. Evans WC (3002): Trease and Evan's Pharmacognosy. 15<sup>th</sup>edn., Saunder' Elsevier Pvt Ltd. NewDelhi-24, India.

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- 2. Quality Standards of Indian Medicinal Plants. New Delhi: ICMR.
- 3. Medicinal Plants of India. New Delhi: ICMR.
- 4. Medicinal Plants of Himachal Pradesh by Dr. N.S. Chauhan Minerva Publications.

5. S.S HandaTextbook of Pharmacognosy Vallabh Publications, New Delhi.

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#### **BPA-606 PHARMACOLOGY -II**

Teaching Scheme			Credits	Marks	Duration of		
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks. Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

Coagulants (Alum, Chitosan) and anticoagulants (heparin, warfarin, aspirin), Antiplatelet (clopidogrel, dipyridamole, aspirin) and fibrinolytic drugs (streptokinase and urokinase), haematinics (iron, Vit.  $B_{12}$  folic acid, Vit. C)

#### **Unit II**

Pharmacology of Endocrine System:

Introduction to endocrine Pharmacology, thyroid and antithyroid agents, hormones of pancreas and oral hypoglycemics, adrenocorticosteroids and adrenocortical antagonist, pituitary hormones, gonadal hormones and their inhibitors,

#### **Unit III**

Oral contraceptives uses, side effects and mechanism of action -Levonorgestrel, Estrogen, Progestin and hormones regulating calcium homeostasis.Parathyroid hormone (PTH), 1,25-dihydroxy Vitamin D3 (Vitamin D3), and Calcitonin, regulate Ca++ resorption, reabsorption, absorption and excretion from the bone, kidney and intestine.

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#### UnitIV

Chemotherapy of Microbial Diseases: General principle of chemotherapy, Sulphonamides, quinolones, pencillins, cephalosporins, aminoglycosides, protein synthesis inhibitors (tetracyclines), antimalarial drug, drugs for amoebiasis, helminthiasis. Chemotherapy of tuberculosis, RTCP, leprosy and chemotherapy of antiviral agent including drugs for HIV infection, anticancer drugs, multidrug resistance (MDR).

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## Text Books:

- 1. Tripathi KD. Essential of medical Pharmacology, New Delhi: Jaypee Brothers Medical Publishers.
- 2. Ghosh MN. Fundamentals of Experimental Pharmacology. Kolkata: Scientific Book Agency.
- 3. A book of Clinical Pharmacology- R Kumar.

#### Reference Books:

- 1. Rang MP, Dale MM, Riter JM. Pharmacology. New York: Churchill Livingstone.
- 2. Brunton LL, Lazo JS, Parker KL. Goodman and Gilman's The Pharmacological Basis of Therapeutics. New York: McGraw Hill.
- **3.** Mycek MJ, Harvey RA, Champe PC. Lipponcott's Illustrated Reviews Pharmacology. Philadelphia: Lippincott Williams & Wilkins

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# **BPA-715: HOSPITAL TRAINING**

L	T	P	Credits,	
-			assigned	
-	-	-	2	

Hospital training of 15 days is to be satisfactorily completed before a student is declared eligible for the degree. Normally hospital training will be arranged at the end of 6<sup>th</sup> semester either in one stretch or two stretches during end semester vacations

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SEMESTER-VII

# BPA-701 PHARMACY ACT RULES & REGULATIONS & PHARMACEUTICAL MANAGEMENT

 T	eaching Scl	heme	Credits	Marks			Duration of
L	Т	P/D	С	Sessional	End Semester Examinatio	Total n	End Semester Examination
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit-I

Code of pharmaceutical Ethics:-Introduction, code, pharmacist, in relation to his job, trade, hisprofession, pharmacist oath.

**Drugs and Cosmetics Act and rules:-** Introduction, definition, schedule to act and rule, Provisions applicable to Ayurvedic (including Sidha), Unani and homeopathic drugs.

#### **Unit-II**

Narcotic drugs and psychotropic substances:-Introduction, definition, authorities, prohibition, control and regulation, offences and penalities of narcotics and drugs and Psychotropic drugs.

**Pharmacy Act:**-Introduction, definition, PCI, State pharmacy council, Registration of Pharmacists, Offences and Penalties.

#### Pharmaceutical Management:-

#### **Unit-III**

Management and its Principles:-Characterstics, importance, levels and function of management, principles of management, coordination, communication, motivation and leadership quality of management.

#### **Unit-IV**

Pharmacist:-Recruitment, training, evaluation and compensation to the pharmacist.

Schedule T – GoodManufacturing Practice of Indian systems of medicine. Components of GMP (Schedule – T) and its objectives, Infrastructural requirements, working space, storage area, machinery and equipments, standard operating procedures.

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Text Books: Recent editions of the following books to be referred

- 1. Jain, NK. Textbook of Forensic Pharmacy. New Delhi: Vallabh Prakashan.
- 2. Mehta RM. Pharmaceutical Production Management. New Delhi: Vallabh Prakashan.

## Reference Books:

- 1. Kotler P, Armstrong. Principles of Marketing. New Delhi: PHI Learning Pvt Ltd
- 2. Wadedhra BL. Law Relating to Patents, Trademarks, Copyright Design and Geographical Indications. New Delhi: Universal Law Publishing.

3. Bansal P. IPR Handbook for Pharma Students and Researchers. Hyderabad: Pharma Book Syndicate.

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BPA-702 PHARMACEUTICAL TECHNOLOGY FOR AYURVEDIC DRUGS- II

Te	eaching Scl	neme	Credits	Marks			<b>Duration of</b>
L	T	P/D	С	Sessional	Total	End Semester Examination	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may asked to attempt only 1

question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit-I

#### Sustained release formulation:

Objectives, advantage & limitation of sustained release tablets, Classification of Sustained release formulations, techniques for preparing sustained release formulations, evaluation of sustained release tablets.

#### **Unit-II**

**Liposomes:**-Introduction, therapeutic application, classification of liposomes, method of Liposomes preparation and drug loading, characterization of liposomes.

#### **Unit-III**

#### a.)Microsphere

Types of Microsphere, polymer used factors consideration for the preparation of microsphere, objective of microsphere, different techniques used to formulation of microsphere.

**b.)Phytosome:** Introduction, properties, advantages of phytosomes, method of preparation, and characterization of phytosomes and pharmaceutical applications of Phytosome.

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#### **Unit-IV**

## a.) Standardization of Herbal drugs:

Standardization parameters, quality assurance and stability testing of Herbal drugs as per WHO / ICH guidelines applicable to the various herbal drugs.

**b.)Quality control test of Herbal drugs:**-In process quality control test for Ayurvedic tablet, Ayurvedic capsule, injectables and liquid orals (monophasic and biphasic).

Text Books: Recent editions of the following books to be referred

- 1. Jain NK. Novel and Drug Delivery Systems, New Delhi: CBS Publishers.
- **2.** Aulton ME. Pharmaceutics: The Science of Dosage Form Design.London: ELBS/ChurchillLivingstone.
- 3. Thakur R. Tabular Pharmaceutics, Vol. I, Edn. I Pranav Prakashan H.P.

#### Reference Books:

- 1. Robinson R, Lee VHL. Novel Drug Delivery Systems. New York: Marcel Dekker
- 2. Carter SJ. Cooper & Gunn's Tutorial Pharmacy. New Delhi: CBS Publishers.
- 3. Bean HS, Becket AH, Carless JE. Advances in Pharmaceutical Sciences. Vol.

5.London: Academic Press.

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## BPA-711P PHARMACEUTICAL TECHNOLOGY FOR AYURVEDIC DRUGS- II

-	T	eaching Scl	heme	Credits	Marks			<b>Duration of</b>
	L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
L	0 0 3 1				25	25	50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

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#### List of experiments:

- 1. To determine the dissolution of sustained release tablets.
- 2. To determine the dissolution of marketed ayurvedic tablets.
- 3. To determine the dissolution of marketed ayurvedic capsules.
- 4. Formulation or evaluation of Microsphere.
- 5. Formulation and evaluation of shampoo.
- 6. Formulation and evaluation of herbal shampoo.
- 7. To determine the dissolution of Ayurvedic drugs/ film coated tablets.
- 8. To determine the dissolution of enteric coated tablets.
- 9. To determine the disintegration time of enteric coated tablets.
- 10. To determine the disintegration time of sugar coated tablets.

Text Books: Recent editions of the following books to be referred

- 1. Jain NK. Novel and Drug Delivery Systems, New Delhi: CBS Publishers.
- 2. Aulton ME. Pharmaceutics: The Science of Dosage Form Design.London:

ELBS/ChurchillLivingstone.

#### Reference Books:

- 1. Robinson R, Lee VHL. Novel Drug Delivery Systems. New York: Marcel Dekker
- 2. Carter SJ. Cooper & Gunn's Tutorial Pharmacy. New Delhi: CBS Publishers.
- 3. Bean HS, Becket AH, Carless JE. Advances in Pharmaceutical Sciences. Vol.
- 5.London: Academic Press.

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BPA-703 PHARMACOLOGY & TOXICOLOGY OF AYURVEDIC DRUGS -II

-	T	eaching Sc	heme	Credits	Marks	Marks			
	L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination	
L	2	0	0	2	40	60	100	3 hrs	

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may asked to attempt only 1

question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

Drugs used in the treatment of Respiratory tract disorders. Pharmacotherapy of cough. Pharmacotherapy of bronchial asthma and related air way inflammations. Ayurvedic approach for the treatment of Asthma (Symptoms, Classification, root causes, treatment and cure).

#### **Unit II**

Drugs used in the treatment of cardiovascular system. Pharmacotherapy of hypertension. Pharmacotherapy of arrhythmia. Pharmacotherapy of cardiac failure. Pharmacotherapy of angina pectoris. Ayurvedic approach for hridya roga

#### **Unit III**

Immunology and Immunological Preparations: Principles, antigens and haptens, immune system, cellular humorai immunity, immunological tolerance, antigen-antibody reactions and their applications. Hypersensitivity, Active and passive immunization; Vaccines- their preparation, standardization and storage.

#### **Unit IV**

Steroids and related drugs: Steroidal nomenclature and stereochemistry, androgens and anabolic agents, estrogens, and progestational agents, adrenocorticoids.

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#### Text Books:

- **1.** Tripathi KD. Essential of medical Pharmacology, New Delhi: Jaypee Brothers MedicalPublishers.
- 2. Ghosh MN. Fundamentals of Experimental Pharmacology. Kolkata: Scientific Book Agency.
- 3. A book of Clinical Pharmacology- R Kumar.

#### Reference Books:

- 1. Rang MP, Dale MM, Riter JM. Pharmacology. New York: Churchill Livingstone.
- 2. Brunton LL, Lazo JS, Parker KL. Goodman and Gilman's The Pharmacological Basis of Therapeutics. New York: McGraw Hill.
- **3.** Mycek MJ, Harvey RA, Champe PC. Lipponcott's Illustrated Reviews Pharmacology. Philadelphia: Lippincott Williams & Wilkins

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BPA-704 PHARMACEUTICAL ANALYSIS OF AYURVEDIC DRUGS-III

T	eaching Scl	heme	Credits	Marks		Duration of	
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may asked to attempt only 1

question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

#### Introduction of Spectroscopy

Nature of electromagnetic radiations, the interaction between energy and matter, application of quantum mechanic theory, the absorption of energy by atoms and molecules, the emission of radiant energy by atoms and molecules; Applications in Pharmaceutical Industry.

#### Ultraviolet and visible spectrophotometry:

Electronic excitation, quantitative laws, deviations from Beer's law, graphical presentation of data, chromophores, photometric error, instrumentation (light sources, prism and grating monochromators, photomissive and photomultiplier tubes), applications (direct and indirect methods, analysis of mixture).

#### Unit II

#### Flame Photometry:

Theory, quantitative description, experimental factors affecting fluorescence intensity, relationship of fluorescence structure, instrumentation (cell, light sources, wavelength selection and detectors) pharmaceutical applications.

Unit III

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## a) Infrared spectrophotometry:

Theory, characteristic absorption bands of organic functional groups, Frequency range, bandwidth and scan speed, concentration range and absorbance value, preparation of sample, sample cell, IR instrumentation, (light sources, monochromatic detector), qualitative and quantitative applications in pharmaceutical analysis.

b) Introduction of Atomic absorption spectroscopy and applications of these techniques in the field of Ayurveda.

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#### Unit IV

Techniques by Chromatographic bed shape-1. Column Chromatography 2. Planar Chromatography, Displacement Chromatography, Techniques by physical state of mobile phase-1. Gas Chromatography 2. Liquid Chromatography.

#### **Text Books:**

- 1. Lee, DC. Pharmaceutical Analysis. London: Blackwell.
- 2. Munson JW. Pharmaceutical Analysis: Modern Methods. Part A & B. New York: MarcelDekker

#### Reference Books:

- 1. Willard HH, Merritt LL, Dean JA. Instrumental Methods of Analysis. New Delhi: CBS Publishers.
- 2. Ewing GW. Instrumental Methods of Chemical Analysis. Singapore: McGraw Hill.
- 3. Schirmer RE. Modern Methods of Pharmaceutical Analysis. Vol 1 & 2. Pennsylvania: FranklinBook Co.
- 4. Kemp W. Organic Sepctroscopy: London: ELBS / WH Freeman & Co.

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#### BPA-712 P PHARMACEUTICAL ANALYSIS OF AYURVEDIC DRUGS-III

T	eaching Scl	heme	Credits	Marks			<b>Duration of</b>
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

## List of experiments:

- 1. To carry out TLC of different single or compound drugs/formulations.
- 2. To carry out paper chromatography of different single or compound drugs/formulations.

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- 3. To carry out pH of different single or compound drugs/formulations.
- 4. To carry out pH of different single or compound drugs/formulations.
- 5. To prepare standard solution.
- 6. To prepare 0.1 N solution of various reagents
- 7. To compare standard graph of UV.
- 8. To compare standard graph of IR.
- 9. To compare standard graph of NMR.
- 10. To compare standard graph of Mass.

#### **Text Books:**

- 1. Lee, DC. Pharmaceutical Analysis. London: Blackwell.
- 2. Munson JW. Pharmaceutical Analysis: Modern Methods. Part A & B. New York:

MarcelDekker

#### Reference Books:

- 1. Willard HH, Merritt LL, Dean JA. Instrumental Methods of Analysis. New Delhi: CBS Publishers.
- 2. Ewing GW. Instrumental Methods of Chemical Analysis. Singapore: McGraw Hill.
- 3. Schirmer RE. Modern Methods of Pharmaceutical Analysis. Vol 1 & 2. Pennsylvania: FranklinBook Co.
- 4. Kemp W. Organic Sepctroscopy: London: ELBS / WH Freeman & Co.

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## BPA-705 BHAISHAJYA KALPNA -III

T	eaching Sc	heme	Credits	Marks			<b>Duration of</b>
L	Т	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may asked to attempt only 1

question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

#### Ausadha kalpana

Vati kalpana, synonyms of vati e.g. gutika, varti, vataka, pinda, pindi, modaka, modern aspect of vati (tablet), coating of tablets, polishing, varti kalpana, suppositories, guggulu kalpana lavana kalpana, arka lavana, narikela lavana, masi kalpana, hastidantmasi, triphala masi, ayaskrti kalpana, kshira paka, kshara kalpana, kshara sutra, apamarga ksara, snuhi ksara.

#### Unit II

#### Snehakalpana

Ghrta, taila, sneha murcchana, ghrta murcchana, taila murcchana, sarsapataila murcchana, general method of sneha paka, mrdu paka, madhyam paka, khara paka, ama paka, dagdha paka, patra paka or gandha paka, surya paka (adityapaka).

#### **Unit III**

#### Sandhanakalpana

Classification of sandhana kalpana, asava and arista kalpana, preparation of asava and arista, , other types of sandhana kalpana, sidhu, sura, prasanna, kadambari, jagala, medaka, bakkasa, varuni, sukta, chukra, kanjika, sandaki, modern aspect of alcoholic formulations.

#### **Unit IV**

#### Standardization protocols

Protocols for standardization for each step of drug production i.e. from the raw drug standardization to the standardization of finished product. Protocol-I, standardization of raw drug,

College of Ayarvedic Finarmaceutical Sciences Joginder Nagar, Distt. Mandi (H.P.) Protocol-II, SOP's for preparation of extracts, Protocol-III, standardization of plant extract(part used), Protocol-IV, SOP's of finished products, Protocol-V, standardization of formulations. Inprocess standardization: SOP's for preparation of Asava-Arista, Churna, Avaleha, Ghrita/Taila, Guggulu kalpa, Vati. Final product standardization: Analytical specifications of Asava-Arista, Churna, Avaleha, Ghrita/Taila, Guggulu kalpa, Vati, Lepa, Kshara&Lavana.

#### **Text Books:**

- Text book of Bhaishajya Kalpana Vigyana (A Science of Indian Pharmacy) by Dr. K.Ramachandra Reddy, Chaukhamba.
- 2. Text Book of Bhaishajya Kalpana Vigyana by Dr. Siddhinandana Mishra, Chaukhamba Sanskrit Bhawan, Varanasi.
- 3. Text book of Bhaishajya Kalpana Vigyana by Dr. Santosh Kumar Mishra, ChakhambhaOrientalia, Varanasi.

#### Reference Books:

- 1. The Drugs & Cosmetics Act 1940.
- 2. The Ayurvedic Formulary of India, Part-I&II Govt. of India Publication.
- 3. The Ayurvedic Pharmacopoeia of India Part-II, Govt. of India Publication.
- 4. Rasa Tantra Sara avum Siddha Prayog Sangraha, Sri Krishan Gopal Bhawan Kaleda, Rajasthan.

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## BPA-713 P BHAISHAJYA KALPNA –III

16	eaching Sc	neme	Credits Marks				<b>Duration of</b>
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

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## List of experiments:

- 1. Compulsory formulation of Chyawanprash.
- To prepare Narikela lavana.
- 3. To prepare Arka lavana.
- 4. To prepare triphala masi.
- 5. To prepare Lasuna Kshira paka.
- 6. Preparation of Ghrita.
- 7. Preparation of Taila.
- 8. Preparation of Asava.
- 9. Preparation of Aristha.
- 10. Preparation of Varti.
- 11. Preparation of Vati.
- 12. Preparation of Guggulu kalpana.

#### **Text Books:**

- 1. Text book of Bhaishajya Kalpana Vigyana (A Science of Indian Pharmacy) by Dr. K.Ramachandra Reddy, Chaukhamba.
- 2. Text Book of Bhaishajya Kalpana Vigyana by Dr. Siddhinandana Mishra, Chaukhamba Sanskrit Bhawan, Varanasi.
- 3. Text book of Bhaishajya Kalpana Vigyana by Dr. Santosh Kumar Mishra, ChakhambhaOrientalia, Varanasi.

Reference Books:

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- 1. The Drugs & Cosmetics Act 1940.
- 2. The Ayurvedic Formulary of India, Part-I&II Govt. of India Publication.
- 3. The Ayurvedic Pharmacopoeia of India Part-II, Govt. of India Publication.
- 4. Ayurved Sara Sangraha.
- 5. Rasa Tantra Sara avum Siddha Prayog Sangraha, Sri Krishan Gopal Bhawan Kaleda, Rajasthan.

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#### **BPA-706-I YOGA**

	eaching Sc	heme	Credits	Marks		Duration of End Semester Examination	
L	T P/D		C	Sessional	End Semester Examination		Total
2	2	0	3	40	60	100	3 hrs

**Note:** The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

#### Astanga yoga:

Yama, Niyama Asana and its importance Standing Postures Ardhakatichakrasana, Padahastasana, Ardhachakrasana, Trikonasana. Sitting postures Swasthika, Gomukhasana, Padmasana, Vajrasana, Bhadrasana, Shashankasana, Ushtrasana, Pashchimottanasana, Suptavajrasana, ardhamatsyendrasana, Siddhasana.

#### **Unit II**

Supine Postures Pavanamuktasana, Sarvangasana, Matsyasana, Halasana, Chakrasana, Shavasana, Setubandhasana. Prone postures Bhujangasana, Shalbhasana, Dhanurasana, Makarasana.

Suryanamaskara - procedure and benefits, Surya kriya

#### **Unit III**

#### Pranayama

Benefits of pranayama, time of practice, avara-pravara-madhyama lakshana, yukta-ayukta lakshana Nadishudhi Pranayama.

#### **Unit IV**

Kumbhakabheda— suryabhedana, ujjayi, sheetali, Sitkari, Bhastrika, Bhramari, Nadishudhilakshana

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## Text Books:

- 1. Yog avum Pranayam Cikitsaya Rahasaya by Dr. Anuplata Singla.
- 2. Pranayam. The Modulator of life by Dr. Sarvesh Kumar Aggarwal.

## Reference Books:

 Yog Chikitka avum Udhar Rog Nivarana by Acharaya Vishvnath Devadi.

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- 2. Hath Yog Pradipika by Dr. Sarvesh Kumar Aggarwal.
- 3. Yoga and Naturopathy by Dr. Chanderbhan Sharma.

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#### **BPA-714-I P YOGA**

T	eaching Sc	heme	Credits	Marks	Marks				
L	T	P/D	С	Sessional		d nester imina		Total	End Semester Examination
0	0	3	1	25	1 0	25		50	3 hrs

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#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class.

Practical demonstration of some of the mentioned Asana, Pranayamas.

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#### Text Books:

1. Yog avum Pranayam Cikitsaya Rahasaya by Dr. Anuplata Singla.

2. Pranayam. The Modulator of life by Dr. Sarvesh Kumar Aggarwal.

#### Reference Books:

- 1. Yog Chikitka avum Udhar Rog Nivarana by Acharaya Vishvnath Devadi.
- 2. Hath Yog Pradipika by Dr. Sarvesh Kumar Aggarwal.
- 3. Yoga and Naturopathy by Dr. Chanderbhan Sharma.

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#### **BPA-706-II AFI**

<u></u>	eaching Sc	heme	Credits	Credits Marks			
L	T	P/D	С	Sessional	End Semester Examination		
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may asked to attempt only 1

question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

Theory

#### Unit I

Introduction of AFI and its importance.

#### **Unit II**

Study of different dosage forms described in AFI.

#### **Unit III**

Doses of different dosage forms described under AFI.

#### **Unit IV**

Shelf life of different Ayurvedic dosage forms as per API/AFI.

#### **Text Books:**

- 1. AFI Part. I & II
- 2. Relevant parts of basic texts Chakradutt, Bhaishjaya Ratnawali etc.

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**BPA-714-II P AFI** 

T	eaching Scl	heme	Credits	Marks	· · · · · · · · · · · · · · · · · · ·		Duration of
L	T	P/D	C	Sessional	onal End Total Semester Examination		End Semester Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class. Prepation of different formulations mentioned in AFI.

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#### Text Books:

- 1. AFI Part. I & II
- 2. Relevant parts of basic texts Chakradutt, Bhaishjaya Ratnawali etc.

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#### **BPA-706-III AYURVEDIC COSMETICS**

Te	Teaching Scheme		Credits		Marks		Duration of
L	Т	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Theory

#### Unit I

Introduction and importance of cosmetics as per description in Ayurvedic texts. Study of different medicinal plants described for use as cosmetics such as chandan, padmak, manjistha, sariva, mulathi, nagkesar etc. as mentioned under varnya mahakashaya.

#### **Unit II**

Description of different classical formulations described for various cosmetic purposes such as ubtans, lepa, oils, creams etc.

#### **Unit III**

Study of various preparations used as mouth fresheners, face packs, hair oils, creams, lotions, pastes.

#### **Unit IV**

Study and evaluation parameters of modern technology in preparation of cosmetics such as Cream, Shampoo and Gel.

#### **Text Books:**

 Relevant portions of Charaka, Sushruta, Vagbhata, Sarngadhara, Bhavaprakasha, Yogaratnakara, Madhavanidana and Bhelasamhita

#### Reference Books:

1. Database on medicinal plants CCRAS.

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#### **BPA-714-III P AYURVEDIC COSMETICS**

Te	Teaching Scheme		Credits	Marks	<b>Duration of</b>		
	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

Practicals as per topics in the syllabus for the course will be conducted in the laboratory class.

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- 1. To prepare ubtans(face pack)
- 2. To prepare herbal cream.
- 3. To prepare herbal toothpaste.
- 4. To prepare hair oil.
- 5. To prepare herbal shampoo.
- 6. To prepare herbal soap.
- 7. To prepare mouth fresheners.
- 8. To prepare hand sanitizer.
- 9. To prepare herbal loation.
- 10. To prepare herbal gel.

#### **Text Books:**

 Relevant portions of Charaka, Sushruta, Vagbhata, Sarngadhara, Bhavaprakasha, Yogaratnakara, Madhavanidana and Bhelasamhita

#### Reference Books:

1. Database on medicinal plants CCRAS.

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# SEMESTER-VIII

#### **BPA-801 MEDICINAL CHEMISTRY**

To	Teaching Scheme		Credits	Marks			Duration of
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

#### Drug Metabolism

Introduction: Xenobiotics and general pathways of drug metabolism; Phase-I (Functionalization) and Phase-II (Conjugation).

#### a) Phase-I

Oxidative reactions and Reductive Reactions with complete study of cytochrome P-450 and Flavin monoxygenases electron transport system.

#### b) Phase-II

Conjugation during drug metabolism like Glucuronic acid conjugation, sulphate conjugation, amino acid conjugation, glutathione conjugation, acetyl conjugation and methyl conjugation.

#### **Unit II**

#### Antibiotic and Antimicrobial Agents

The following topics shall be treated covering chemical naming, structure activity relationship, mode of action, Nomenculature, classification, antimicrobial spectrum, and uses. The emphasis would be only on B.P. and I.P. compounds.

- a) General considerations with Sulphonamides and other synthetic antimicrobial agent's.
- b) Disinfectants and antiseptics.

**Unit III** 

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The following topics shall be treated covering chemical naming, structure activity relationship, mode of action, Nomenculature, classification, antimicrobial spectrum, and uses. The emphasis would be only on B.P. and I.P. compounds.

- a) Penicillins and other antibiotics effective mainly against Gram -negative organisms.
- b) Cephalosporins

#### **Unit IV**

The following topics shall be treated covering chemical naming, structure activity relationship, mode of action, Nomenculature, classification, antimicrobial spectrum, and uses. The emphasis would be only on B.P. and I.P. compounds.

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- a) Antineoplastic agent .
- b) Antiviral agents

#### **Text Books:**

- 1. Foye WC. Principles of Medicinal Chemistry. Philadelphia: Lea & Febiger.
- 2. Beale JM, Block JH. Wilson and Gisvold's Text book of Organic Medicinal and PharmaceuticalChemistry. Philadelphia: Lippincott Williams and Wilkins.

#### Reference Books:

- 1.Hansh C. Comprehensive Medicinal Chemistry -Quantitative Drug Design. Vol. IV. Oxford:Pergamon Press.
- 2.Jurs PC. Computer Software Application in Chemistry. New York: John Wiley & Sons.
- 3. Pops and Perruns. Computer Aided Drug Design. New York: Academic Press

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#### **BPA-814P MEDICINAL CHEMISTRY**

Te	Teaching Scheme		Credits	Marks		No.	<b>Duration of</b>
L	Т	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

Practical's as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

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#### List of experiments

- 1. Prepartion of Antimicrobial Agents.
- 2. Prepartion of Antiseptic compounds.
- 3. Prepartion of Chlorobutanol compounds.
- 4. Prepartion of Triphenyl imidazole compounds.
- 5. Preparation of medicinally important compounds by Microwaveirradiation technique.
- 6. Preparation of medicinally important compounds by Microwaveirradiation technique.
- 7. Drawing penicillin structures and reactions using chem draw®.
- 8. Drawing cephalosporin structures and reactions using chem draw®.
- 9. Drawing Antiviral structures and reactions using chem draw®.
- 10. Drawing Floroqinolones structures and reactions using chem draw®.

#### **Text Books:**

- 1. L.G. Chatten, Pharmaceutical Chemistry, Vol.-1 and 2, Marcel Dekker, NY (Latest Edition).
- 2. A.H. Beckett and J.B. Stenlake, Practical Pharmaceutical Chemistry, Vol.1 and 2, Athlone Pressof the University of London (Latest Edition).

#### Reference Books:

- 1. Wilson and Giswold's Organic medicinal and Pharmaceutical Chemistry.
- 2. Foye's Principles of Medicinal Chemistry.
- 3. Burger's Medicinal Chemistry, Vol I to IV.
- 4. Introduction to principles of drug design- Smith and Williams.

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- 5. Remington's Pharmaceutical Sciences.
- 6. Martindale's extra pharmacopoeia.
- 7. Organic Chemistry by I.L. Finar, Vol. II.
- 8. The Organic Chemistry of Drug Synthesis by Lednicer, Vol. 1-5.

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- 9. Indian Pharmacopoeia.
- 10. Text book of practical organic chemistry- A.I. Vogel.

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#### **BPA-802 PHARMACEUTICAL ANALYSIS**

T	Teaching Scheme		Credits	Marks			
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

#### a) Nuclear Magnetic Resonance Spectroscopy

An introduction to the theory of NMR, magnetic properties of the nuclear magnetic moments, absorption of energy, chemical shift, shielding and deshielding, spin-spin coupling, NMR instrumentation, analytical application in pharmaceutical analysis.

#### b) Mass Spectrometry

Instrumentation, Basic principle determination of the molecular formula, recognition of the molecularion peak, fragmentation, mass spectra of simple compounds (saturated hydrocarbons).

#### Unit II

#### a) Atomic Absorption Spectroscopy

Theory of absorption of radiant energy by atoms, equipment, analytical applications.

b) Principle of Turbidimetry and Nephlometry with their Instrumentation and Apllications.

#### **Unit III**

#### a) Affinity Chromatography

Supercritical fluid Chromatography, Techniques by separation Mechanism-1.Ion exchange Chromatography 2. size exclusion Chromatography 3.EBA Chromatographic separation.

#### b) Special Chromatography

Special Techniques-1.Reversed phase Chromatography 2.Two dimensional Chromatography 3.Simulated moving bed Chromatography 4.Pyrolysis gas Chromatography 5.Fast protein Liquid Chromatography 6.countercurrent Chromatography 7.chiral Chromatography.

Unit IV

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#### a) X-Ray

The theoretical aspects, instrumentation, interpretation of spectra and applications of X-ray diffraction in Pharmacy.

## B) Radio Immuno Assay (RIA)

The theoretical aspects, instrumentation and diagnostic, medical and pharmaceutical applications of RIA

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#### Text Books:

- 1. Lee, DC. Pharmaceutical Analysis. London: Blackwell.
- 2. Munson JW. Pharmaceutical Analysis: Modern Methods. Part A & B. New York: MarcelDekker

#### Reference Books:

1. Willard HH, Merritt LL, Dean JA. Instrumental Methods of Analysis. New Delhi: CBS Publishers.

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- 2. Ewing GW. Instrumental Methods of Chemical Analysis. Singapore: McGraw Hill.
- 3. Schirmer RE. Modern Methods of Pharmaceutical Analysis. Vol 1 & 2. Pennsylvania: FranklinBook Co.
- 4. Kemp W. Organic Sepctroscopy: London: ELBS / WH Freeman & Co.

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## **BPA-811P PHARMACEUTICAL ANALYSIS**

T	Ceaching Scheme		Credits	Marks		<b>Duration of</b>	
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
0	0	3	1	25	25	50	3 hrs

#### Note:

Practical's as per topics in the syllabus for the course will be conducted in the laboratory class. Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

## List of experiments

- 11. Identification of Amino acids by Ascending Paper Chromatography.
- 12. Separation of Amino acids by Ascending Paper Chromatography.
- 13. Identification of sugars by Thin Layer Chromatography.
- 14. Separation of sugars by Thin Layer Chromatography.
- 15. Separation of active principle of Drug (Sumo) by Thin Layer Chromatography.
- 16. Identification of active principle by comparing with standard Drug.
- 17. Moisture Analysis in powder drugs.
- 18. Measurement of Optical activity in different drugs.
- 19. Mesurement of Refractive Index.
- 20. Determination of pH of various Extract.

#### Text Books:

- 3. L.G. Chatten, Pharmaceutical Chemistry, Vol.-1 and 2, Marcel Dekker, NY (Latest Edition).
- 4. A.H. Beckett and J.B. Stenlake, Practical Pharmaceutical Chemistry, Vol.1 and 2, Athlone Pressof the University of London (Latest Edition).

#### Reference Books:

- 1. H. Willard, L.L., Marriott; Jr., J.A. Dean, Instrumental Method of Analysis, Van Nostrand Reinhold, N.Y.
- 2.J.W. Robinson, Undergraduate Instrumental Analysis, Marcel and Dekker Inc., NY, 1970 (Latest Edition).
- 3. V.M. Parikh, Absorption Spectroscopy of Organic Molecules, Addison Wesley Publishing Co., London, 1974.

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#### BPA-803 BHAISHAJYA KALPNA-IV

T	Teaching Scheme		Credits	Marks	No.	<b>Duration of</b>	
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may asked to attempt only 1

question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

#### Pathya kalapna

Manda kalpana, yavagu, peya, vilepi, vilepi guna, anna (bhakta) kalpana, guna of anna kalpana, krisara kalpana, guna of krisara, kamblika and khada, raga-sadava, takrakalpana, Takra kalpana, ghola, guna of ghola, mathita, takra, udasvit, chacchika, katvara, dadhi kurcika takra kurcika.

#### **Unit II**

#### Bahya kalpana

Lepa kalpana, doshghna lepa, visghna lepa, varnya lepa, technique of lepa application, time of lepa application, preservative of lepa, dasanga lepa, some of the examples of lepa preparation, satadhauta ghrta, sahasradhauta ghrta, malahara kalpana (maraham), sarjarasa malahara (ralamalahara), siktha tila, gandhakadya malahara, atasyadi upanaha, dhupana kalpana, ointments, creams, pastes, jellies, liniments, lotions.

#### **Unit III**

a) Netra kalpana

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Seka, aschyotana, pindi (kavalika), bidalaka, aksitarpana, putapaka, anjana.

## b)Mukha kalpana

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Gandusha and kavala kalpana, snaihika gandusa kalpana, mukha paka gandusa, indications of gandusa and kavala, pratisarana (manjan), pratisarana yoga, irimedaditaila.

## c)Nasika kalpana

Classifications of nasya, navana nasya, avapida nasya, dhmapana nasya (pradhamana nasya), dhuma nasya, marsa, pratimarsa nasya, nasya drugs mentioned by different aurthors, indications of nasya karma, contraindications of nasya karma, nasya ausadhi kalpana, procedure of nasya karma, determination of dosages in nasya karma, instructions for the patients during nasya, nasya vyapada (complications), advantages of adequate nasya karma.

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#### **Unit IV**

#### a) Dhumpana kalpana

Dhumanadi, dhumpana kalpana, dhumpana pascta karma, preparation of dhuma netra, methods of dhumpana, yogya for dhumpana, ayogya for dhumpana.

#### b) Vasti kalpana

Classification of vastikalpana, karma vasti-kalavasti-yoga vasti, indications of asthapana vasti, contraindications of asthapana vasti, indications of anuvasana vasti, contraindications of anuvasana vasti, procedure of vasti karma, drugs commonly used for vasti kalpa purpose, common formulations meant for asthapana vasti, procedure of vasti, vasti pratyagama kala, features of samyaka vasti, features of asamyaka vasti, features of excess (atiyoga) vasti, postvasti regimen, activities should be avoided after vasti karma, vasti vyapada (complications), modern aspect of enema.

#### Text Books:

- 1. Text book of Bhaishajya Kalpana Vigyana (A Science of Indian Pharmacy) by Dr. K.Ramachandra Reddy, Chaukhamba.
- 2. Text Book of Bhaishajya Kalpana Vigyana by Dr. Siddhinandana Mishra, Chaukhamba Sanskrit Bhawan, Varanasi.
- 3. Text book of Bhaishjaya Kalpana Vigyana by Dr. Santosh Kumar Mishra, ChakhambhaOrientalia, Varanasi.

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## Reference Books:

- 1. The Drugs & Cosmetics Act 1940.
- 2. The Ayurvedic Formulary of India, Part-I&II Govt. of India Publication.
- 3. The Ayurvedic Pharmacopoeia of India Part-II, Govt. of India Publication.
- 4. Ayurved Sara Sangraha.
- 5. Rasa Tantra Sara avum Siddha Prayog Sangraha, Sri Krishan Gopal Bhawan Kaleda, ATAL MEDICAL & RESEARCH Rajasthan.

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#### BPA-812 P BHAISHAJYA KALPNA-IV

T	Teaching Scheme		Credits	Marks		<b>Duration of</b>	
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination
0	0	3	1.00	25	25	50	3 hrs

#### Note:

Practical's as per topics in the syllabus for the course will be conducted in the laboratory class.

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- 1. To prepare different Pathya Kalpana.
- 2.To prepare Dashang lepa.
- 3. To prepare Siktha taila.
- 4. To prepare Hingulamrita malhara.
- 5. To prepare Sarjrasa malhara.
- 6.To prepare Shatdhauta ghrita.
- 7. To prepare Anuvasna Vasti.
- 8. To prepare Asthapana Vasti.
- 9.To prepare Dant manjan.
- 10. To prepare Ayurvedic face pack.

#### **Text Books:**

- 1. Text book of Bhaishajya Kalpana Vigyana (A Science of Indian Pharmacy) by Dr.K.Ramachandra Reddy, Chaukhamba.
- 2. Text Book of Bhaishajya Kalpana Vigyana by Dr. Siddhinandana Mishra, ChaukhambaSanskrit Bhawan, Varanasi.
- 3. Text book of Bhaishajya Kalpana Vigyana by Dr. Santosh Kumar Mishra, ChakhambhaOrientalia, Varanasi.

#### Reference Books:

- 1. The Drugs & Cosmetics Act 1940.
- 2. The Ayurvedic Formulary of India, Part-I&II Govt. of India Publication.
- 3. The Ayurvedic Pharmacopoeia of India Part-II, Govt. of India Publication.
- Ayurved Sara Sangraha.
- 5. Rasa Tantra Sara avum Siddha Prayog Sangraha, Sri Krishan Gopal Bhawan Kaleda, Rajasthan.

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## BPA-804 PHARMACEUTICS- PHARMACOKINETICS AND BIOPHARMACEUTICS

	Teaching Scheme		Credits	Marks	Marks		
2	Т	P/D	C	Sessional	End Semester Examination	Total	End Semester Examination
3		0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit-I

- a.)Introduction Introduction to biopharmaceutics and pharmacokinetics, schematic representation of pharmacokinetic process and drug therapeutics.
- **b.)Absorption:** Mechanism of drug absorption (passive diffusion, active transport, facilitated diffusion and pinocytosis), factors influencing GI absorption of drugpharmaceutical and patient related factors.

#### **Unit-II**

Pharmacokinetics: Basic consideration and Non Linear Pharmacokinetics:

- a.) Pharmacokinetics-Basic Considerations: Significance of plasma drug concentration time profile, volume of distribution, partition coefficient, classification of pharmacokinetics models.
- b.) Non Linear Pharmacokinetics: Causes of non-linearity, Michaelis-Menten equation, determination of Vmax and Tmax.

#### **Unit-III**

Biopharmaceutics: Bioavailability and Bioequivalence:

Bioavailability: Objective, consideration and measurement of bioavailability by both methods pharmacokinetics and pharmacodynamic methods, Biopharmaceutics drugs

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classification System, Method of enhancement of bioavailability, Bioequivalence: Objective, Application of Bioequivalence Studies, general principles of bioequivalence, Criteria for bio equivalence requirement.

#### **Unit-IV**

- a.)Drug Excretion: Concept of clearance, mechanism of renal clearance, clearance ratio, hepatic clearance.
- **b.)Dissolution:-**Concept of dissolution, Theories of dissolution, in-vitro drug dissolution testing models, in vitro sink condition and its role and In vitro-in vivo correlation.

Text Books: Recent editions of the following books to be referred

- Brahmankar DM, Jaiswal SB. Biopharmaceutics and Pharmacokinetics ATreatise.NewDelhi: Vallbah Prakashan.
- 2. Gibaldi M. Biopharmaceutics & Pharmacokinetics. New York: Lea & Febiger.

#### Reference Books:

- 1. Rowland M and Tozer TN. Clinical Pharmacokinetics: Concept& Application. New York: Lea & Febiger.
- 2. Swarbrick J. Biopharmaceutics. New York: Lea & Febiger.
- 3. Shargel L. Applied Biopharmaceutics & Pharmacokinetics. Singaproe: McGraw Hill.

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#### **BPA-805 CLINICAL PHARMACY**

T	eaching Sc	heme	Credits	Marks	Marks			
L	T	P/D	С	Sessional	End Semester Examination	Total	End Semester Examination	
3	0	0	3	40	60	100	3 hrs	

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may asked to attempt only 1

question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

#### Unit I

#### **Clinical Pharmacokinetics**

a) Clinical laboratory tests for Liver function and Kidney function. Drug Interactions Factors-Drag determinants, Host determinants, Multiple drug therapy, Methods of investigating drug interactions, Clinical investigation of specific drug interactions, Pharmacokinetic aspects of drug interaction-Drug elimination, distribution and absorption

Prevention of drug interactions in general practice.

b) Drugs used in pregnancy, pediatrics and geriatrics. Management of cardiovascular disorders, CNS disorders, Gastro-intestinal diseases and respiratory diseases.

#### Unit II

#### Drug information services, documentation and counseling of patients

Ambulatory patient care: Pharmacist's responsibility, proper use of medication, patient counselling, drug utilization review, medication profiles, non-prescription drug usage, health education, new and expanded dimensions, health care delivery systems.

Patient compliance-Non compliance, factors associated with non compliance, improving compliance.

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#### Unit III

## Procurement and distribution of drugs in an Institution (Hospital Pharmacy)

**Hospital** - Definition of hospital pharmacy, organization, and facilities provided- pharmacist's responsibility - technical responsibilities (procurement, storage, dispensing, control, stock and inventory control, manufacturing sterile products, investigational drugs, I.V. admixtures, radiopharmaceuticals, assay and quality control), administrative and academic responsibilities.

ATAL MEDICAL & RESEARCH

UNIVERSITY, HIWACHAL PRADESH

#### **Unit IV**

Intravenous admixtures, Intravenous fluids-packaging systems, administrative sets, administration procedures including volume control method, piggyback method, patient controlled analgesia, final-filter devices, intravenous admixtures—additives, parenteral incompatibility, total parenteral nutrition.

#### **Text Books:**

- 1. M. Rowland and T.N. Tozer, Clinical Pharmacokinetics: Concepts and Applications, Lea and Febiger, Philadelphia. 2<sup>nd</sup> edition, 3989.
- 2. N. Thakur Lecture on Clinical Pharmacy, P. Prakashan, India.
- 3. A book of Clinical Pharmacology- R Kumar.

#### Reference Books:

- 1. Remington, The Science and Practice of Pharmacy, 19<sup>th</sup> edition, 1995, Mack Publishing Co., U.S.A.
- 2. E.V. Klejin and J.R. Jonders, Clinical Pharmacy, Elsevier/North Holland Biomedical Press, NY 1977.
- 3. E.T. Herfindal, D.R. Gourley and L.L. Hart, Clinical Pharmacy and Therapeutics, Williams's and Wilkins, 4<sup>th</sup> edition, London, 1988.

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#### **BPA-813 PROJECT WORK**

L	T	P	rodite	
-	-	-	2	

Note: Students will be allotted to prepare one specific Ayurvedic formulation. They will study the SOP as well as manufacture the formulatuion by observing API norms and they will also perform Quality Control tests and make a conclusion of Drug/Formulation.

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