H.P. TECHNICAL UNIVERSITY
HAMIRPUR (HP)

Syllabus

B.PHARMACY (AYURVEDA)

SCHEME OF TEACHING AND EXAMINATION

SCHEME OF TEACHING AND EXAMINATION B.PHARMACY (AYURVEDA)												
SEMESTER-I												
S.No.	**Category of Paper**	**Paper code**	**Title of Subject**	**Teaching Hours per weak**			**Credits**	**Examination**				
				L	**T**	**P/D**		**Internal Assessment**			**ESE**	**Subject total**
								CT	**TA**	**Total**		
Theory:												
1	**PC**	BPA-101	Fundamentals of Ayurveda including Swasthavritta	**3**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
2	**PC**	BPA-102	Fundamentals of Anatomy and Physiology	**3**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
3	**PC**	BPA-103	Fundamentals of Bhaishajya kalpana-I	**3**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
4	**PC**	BPA-104	Fundamentals of Dravyaguna Vigyan-I	**2**	**-**	**-**	**2**	**20**	**20**	**40**	**60**	**100**
5	**AC**	BPA-105	Computer & its applications in pharmaceutical Sciences	**2**	**-**	**-**	**2**	**20**	**20**	**40**	**60**	**100**
6	**HS**	HS 102	Environmental Science	**2**	**-**	**-**	**2**	**20**	**20**	**40**	**60**	**100**
7	**HS**	HS-101	English Communication Skills	**2**	**-**	**-**	**2**	**20**	**20**	**40**	**60**	**100**
		Labs:										
1	**PC**	BPA-111P	Fundamentals of Anatomy and Physiology	**-**	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
2	**PC**	BPA-112 P	Fundamentals of Bhaishajya kalpana-I	**-**	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
3	**PC**	BPA-113P	Fundamentals of Dravyaguna Vigyan-I	**-**	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
4	**AC**	BPA-114 P	Computer & its applications in pharmaceutical Sciences	**-**	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
			Total =	**17**	**-**	**12**	**21**					
			Total marks									**900**
Total Work load=29							**Total credit=21**					

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 TEACHING AND EXAMINATION B.PHARMACY (AYURVEDA)												
SEMESTER II												
S.No.	**Category of Paper**	**Paper code**	**Title of Subject**	**Teaching Hours per weak**			**Credits**	**Examination**				
				L	**T**	**P/D**		**Internal Assessment**			**ESE**	**Subject total**
								CT	**TA**	**Total**		
Theory:												
1	**PC**	BPA-201	Pharmaceutical Biology	**3**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
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**	BPA-204	Pharmaceutics-(General and Dispensing Pharmacy)	**3**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
5	**PC**	BPA-205	Rasa Shastra-I	**3**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
6	**AC**	HS 201	Business communication	**2**	**-**	**-**	**2**	**20**	**20**	**40**	**60**	**100**
7	**HS**	HS 103	Disaster management	**2**	**-**	**-**	**2**	**20**	**20**	**40**	**60**	**100**
	LABS:											
1	**PC**	BPA-211 P	Pharmaceutical Biology	-	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
2	**PC**	BPA-212 P	Pharmaceutical chemistry (Organic& Inorganic)	-	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
3	**PC**	BPA-213 P	Rasa Shastra-I	**-**	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
			Total =	**18**	**-**	**9**	**21**					
			Total marks									**850**
			Total work load =27					**Total credit=21**				

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 TEACHING AND EXAMINATION B.PHARMACY (AYURVEDA)												
SEMESTER III												
S.No.	**Category of Paper**	**Paper code**	**Title of Subject**	**Teaching Hours per weak**			**Credits**	**Examination**				
				L	**T**	**P/D**		**Internal Assessment**			**ESE**	**Subject total**
								CT	**TA**	**Total**		
Theory:												
1	**PC**	BPA-301	Dravyaguna Vigyan -II	**3**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
2	**PC**	BPA-302	Pharmacognosy of Ayurvedic Drugs-I	**3**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
3	**PC**	BPA-303	Pharmaceutics (Physical pharmacy)	**3**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
4	**PC**	BPA-304	Pharmacology-I	**2**	**-**	**-**	**2**	**20**	**20**	**40**	**60**	**100**
5	**PC**	BPA-305	Rasshastra-II	**3**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
6	**PC**	BPA-306	Applied Physiology	**2**	**-**	**-**	**2**	**20**	**20**	**40**	**60**	**100**
	LABS:											
1	**PC**	BPA-311 P	Dravyaguna Vigyan -II	**-**	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
2	**PC**	BPA-312 P	Pharmacognosy of Ayurvedic Drugs-I	**-**	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
3	**PC**	BPA-313P	Pharmaceutics (Physical Pharmacy)	**-**	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
4	**PC**	BPA-314 P	Rasshastra-II	**-**	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
5	**PC**	BPA-315 P	Applied Physiology	**-**	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
			Total =	**16**	**-**	**15**	**21**					
			Total marks									**850**
			Total work load =31					**Total credit=21**				

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 TEACHING AND EXAMINATION B.PHARMACY (AYURVEDA)												
SEMESTER IV												
S.No.	**Category of Paper**	**Paper code**	**Title of Subject**	**Teaching Hours per weak**			**Cred its**	**Examination**				
				L	**T**	**P/D**		**Internal Assessment**			**ESE**	**Subject total**
								CT	**TA**	**Total**		
Theory:												
1	**PC**	BPA-401	Pharmaceutical analysis of Ayurvedic Drugs-I	**3**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
2	**HS**	HS-402	Human values and Professional Ethics	**2**	**2**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
3	**PC**	BPA-402	Pharmacognosy of Ayurvedic Drugs-II	**3**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
4	**PC**	BPA-403	Pharmaceutics (Principles of Pharmaceutical operations)	**2**	**-**	**-**	**2**	**20**	**20**	**40**	**60**	**100**
5	**PC**	BPA-404	Ras Shastra-III	**3**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
6	**PC**	BPA-405	DravyagunaVigyan -III	**2**	**-**	**-**	**2**	**20**	**20**	**40**	**60**	**100**
	LABS											
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	**-**	**-**	**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 =	**15**	**2**	**12**	**20**					
			Total marks									
			Total work load =29					**Total credit=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 4th 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 TEACHING AND EXAMINATION B.PHARMACY (AYURVEDA)												
SEMESTER V												
S.No.	**Category of Paper**	**Paper code**	**Title of Subject**	**Teaching Hours per weak**			**Credits**	**Examination**				
				L	**T**	**P/D**		**Internal Assessment**			**ESE**	**Subject total**
								CT	**TA**	**Total**		
Theory:												
1	**PC**	BPA-501	Pharmacognosy –II	**2**	**-**	**-**	**2**	**20**	**20**	**40**	**60**	**100**
2	**PC**	BPA-502	Pharmaceutical Analysis of Ayurvedic Drugs-II	**3**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
3	**PC**	BPA-503	Pharmaceutical Technology for Ayurvedic drugs-I	**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:											
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-I	**-**	**-**	**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**					
			Total marks									**800**
			Total work load =26				**Total credit=20**					

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 TEACHING AND EXAMINATION B.PHARMACY (AYURVEDA)												
SEMESTER VI												
S.No.	**Category of Paper**	**Paper code**	**Title of Subject**	**Teaching Hours per weak**			**Credits**	**Examination**				
				L	**T**	**P/D**		**Internal Assessment**			**ESE**	**Subject total**
								CT	**TA**	**Total**		
Theory:												
1	**PC**	BPA-601	Pharmaceutical Engineering	**3**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
2	**PC**	BPA-602	Pharmacology & Toxicology of Ayurvedic Drugs-I	**3**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
3	**PC**	BPA-603	Bhaishajya kalpana-II	**3**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
4	**PC**	BPA-604	Pharmaceutical Microbiology	**2**	**-**	**-**	**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**	**-**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
	LABS											
1	**PC**	BPA-611P	Bhaishajya kalpana-II	**-**	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
2	**PC**	BPA-612 P	Pharmaceutical Microbiology	**-**	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
3	**PC**	BPA-613 P	Pharmacognosy –III	**-**	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
			Total =	**17**		**9**	**20**					
			Total marks									**750**
			Total work load =26					**Total credit=20**				

Note:*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 6th 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 TEACHING AND EXAMINATION B.PHARMACY (AYURVEDA)												
SEMESTER VII												
S.No.	**Category of Paper**	**Paper code**	**Title of Subject**	**Teaching Hours per weak**			**Credits**	**Examination**				
				L	**T**	**P/D**		**Internal Assessment**			**ESE**	**Subject total**
								CT	**TA**	**Total**		
Theory:												
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/IV	YOGA/AFI/ Ayurvedic cosmetics / Market management studies	**2**	**2**	**-**	**3**	**20**	**20**	**40**	**60**	**100**
	LABS:											
1	**PC**	BPA-711P	Pharmaceutical Technology for Ayurvedic Drugs-II	**-**	**-**	**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	**EC**	BPA-714-P I/II/III	YOGA/AFI/ Ayurvedic cosmetics	**-**	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
5	**CC**	BPA-715	Hospital Training	**-**	**-**	**-**	**2**		**40**	**40**	**60**	**100**
			Total =	**12**	**2**	**12**	**19**					
			Total marks									**900**
			Total work load =26					**Total credit=19**				

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 TEACHING AND EXAMINATION B.PHARMACY (AYURVEDA)												
SEMESTER VIII												
S.No.	**Category of Paper**	**Paper code**	**Title of Subject**	**Teaching Hours per weak**			**Credits**	**Examination**				
				L	**T**	**P/D**		**Internal Assessment**			**ESE**	**Subject total**
								CT	**TA**	**Total**		
Theory:												
1	**PC**	BPA-801	Medicinal Chemistry	**2**	**-**	**-**	**2**	**20**	**20**	**40**	**60**	**100**
2	**PC**	BPA-802	Pharmaceutical Analysis	**3**	**-**	**-**	**3**	**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:											
1	**PC**	BPA-811 P	Pharmaceutical Analysis	**-**	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
2	**PC**	BPA-812 P	Bhaishajyakalpana-IV	**-**	**-**	**3**	**1**	**10**	**15**	**25**	**25**	**50**
3	**CC**	BPA-813	Project Work	**-**	**-**		**2**		**40**	**40**	**60**	**100**
			Total =	**14**		**6**	**18**					
			Total marks									**700**
			Total work load =20					**Total credit=18**				

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		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

SEMESTER VISE CREDITS ASSIGNED

S.NO.	SEMESTER	CREDITS ASSIGNED
1	Ist	21
2	2nd	21
3	3rd	21
4	4th	20
5	5th	20
6	6th	20
7	7th	19
8	8th	18
	Total	**160**

Distribution of credits

S.NO	Component	Code	Subject	Credits allotted
1	Additional core	AC	Computer science, human values, Business communication	**5**
2	Program core	PC	That introduces students to foundation of Ay. Pharmacy	**136**
3	Elective core	EC	Market management studies, Ayurvedic cosmetics, Yoga, AFI	**4**
4	Compulsory core	CC	Industrial Training, Hospital training, Project work	**2+2+2=6**
5	Humanities and social sciences	HS	Environmental Science, Disaster management Communication and professional skills in English, Human Values and Professional Ethics	**9**
			Total = 160	

SEMESTER-I

SEMESTER-I

BPA-101 FUNDAMENTALS OF AYURVEDA INCLUDING SWASTHAVRITTA

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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 Ayurveda

Ayurveda Nirupana Lakshana of Ayu, composition of Ayu Lakshana of Ayurveda. Lakshana and classification of Siddhanta. Introduction to basic principles of Ayurveda and their significance.

Ayurveda Darshana Nirupana Philosophical background of fundamentals of Ayurveda.Etymological derivation of the word "Darshana". Nyaya, Vaisheshika, Sankhya and Yoga.Ayurveda as unique and independent school of thought Padartha: Lakshana, enumeration and classification, Bhava and Abhava padartha, Padartha according to Charaka (Karana-Padartha).

Unit II

Dravya Vigyaniyam Dravya: Lakshana, classification and enumeration.

Panchabhuta Brief introduction of panch mahabhoot and lakshan and qualities of each bhoota.

Kaala: Etymological derivation, Lakshana and division / units, significance in Ayurveda.

Dik: Lakshana and division, significance in Ayurveda.

Atma:Lakshana, classification, seat, Gunas, Linga according to Charaka, the method / process of knowledge formation.

Purusha: as mentioned in Ayurveda- Ativahikapurusha/ Sukshmasharira/ Rashipurusha/ Chikitsapurusha/ Karmapurusha/ Shaddhatvatmakapurusha.

Manas: Lakshana, synonyms, qualities, objects, functions, dual nature of mind (*ubhayaatmakatvam*), as a substratum of diseases, penta-elemental nature (*panchabhutatmakatvam*). Role of Panchamahabhuta and Triguna in Dehaprakriti and Manasaprakriti respectively.

Examination

Ten points for examination i.e. Kaarana, karana, karya, karyayoni, karya phala, Anubandha, Desha, kala, Prakriti and Upaya and their utility and application in Pharmacy.

Unit III-Basic Ayurvedic concepts

Swasthvritta prayojna, swastha lakshana, swasthvritta, dincharya, dhumpana, vyayama, kshorkarma, abhyanga, sharira parimarjana, sanan, anulepanadi, vastra dharna, paduka, padatra, chattra, dandadharna, traupastambha, ratrichrya, swapna nidra, bhramcharya, rituchrya, sanchya, prakopa, prashamna of dosha accordinding to ritu, ritusandhi. Importance of aahar, nidra and brahmacharya. Importance of shuddh vayu, jala, desha and kala.

Unit IV- Preventive social medicine and diseases

Mansik sadvritta, samajika swasthavritta, dharmik swasthavritta, dharniya adharniya vega, sanshodhan and sanshamna, Rasayana and vajikarna. Communicable diseases, respiratory diseases such as tuberculosis, whooping cough, influenza, mumps etc. Intestinal infection such as Cholera, hepatitis, Typhoid etc. arthropod, borne diseases such as Dengue, malaria etc. Immunization: National immunization schedule and WHO, EPI immunization schedule.

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 PHYSIOLOGY AND ANATOMY**

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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.

FUNDAMENTALS OF PHYSIOLOGY

Unit I

a.) Basic Tissues

Function of epithelial, connective, muscular and nervous, muscle contraction and properties. Nerve impulse generation and transmission including introductory knowledge of Dosha, Dhatu and Mal with their types and properties.

b.) Body systems

Respiratory system: Respiratory volumes and capacities, ventilation, compliance and resistance, gaseous exchange and transport in blood, nervous and chemical regulations of respirations.

Renal system: Kidney and urinary tracts, nephron transport processes, concentration and dilution of urine, plasma clearances. Micturition.

Unit II- Blood and cardiovascular systems including Digestive system: Body fluids, roles of blood cellular components and plasma proteins, coagulation, blood groups, blood disorders. "Circulation"cardiac cycle, impulse generation and transmission, electrocardiogram; haemodynamics; capillary circulation;

Detail concepts of Doshas, Dhatu and mal, prakriti prikshan and dhatu poshan nyaya.

Digestive system: Nutritional and Vitamin requirements, vitamin deficiencies, structure of alimentary canal, structure and functions of liver.

FUNDAMENTALS OF ANATOMY

Unit III-Introduction and Scope

Introductory knowledge of Anatomy.

Scope & Terminology of Anatomy

Elementary cell and tissues of the Body- Epithelial Tissues, Muscular Tissues, Nervous Tissue.

Unit IV- Skeletal muscles of the body. Nine regions of the abdomen and organs situated in these regions & basic anatomy of the organs e.g. liver, kidney, lungs, heart, pancreas, stomach. Introductory knowledge of Ayurvedic description of Asthi sandhi, Sanayu and Kandra.

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 Oxford University 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.

BPA-111 (P) :-FUNDAMENTALS OF ANATOMY AND PHYSIOLOGY

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

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

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:

1. Gray's Anatomy, edited by P.L. Williams & R. Warwick, 38th 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.

BPA- 103 FUNDAMENTALS OF BHAISHAJYA KALPANA-I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

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.

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:

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, 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.

BPA- 112 (P):- FUNDAMENTALS OF BHAISHAJYA KALPANA-I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
0	0	3	1	40	60	100	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:

1. To study the working principle, mechanism and uses of Dola yantra.
2. To study the working principle, mechanism and uses of Patala yantra.
3. To study the working principle, mechanism and uses of Damru yantra.
4. To study the working principle, mechanism and uses of Khalva yantra.
5. To study the working principle, mechanism and uses of Vidyadhara yantra.
6. To study the working principle, mechanism and uses of Puta yantra.
7. To study the working principle, mechanism and uses of Patana yantra.
8. To study the working principle, mechanism and uses of Disintegrator.
9. To study the working principle, mechanism and uses of Hammer mill.
10. To study the working principle, mechanism and uses of End runner mill.
11. To study the working principle, mechanism and uses of Roller mill.
12. To study the working principle, mechanism and uses of Capsule filling machine.
13. To study the working principle, mechanism and uses of Grinding machine.
14. To study the working principle, mechanism and uses of Tablet making machine.
15. To study the working principle, mechanism and uses of Tablet hardness and disintegration test apparatus.

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, 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.

BPA-104 FUNDAMENTALS OF DRAVYAGUNA VIGYANA – I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

द्रव्यगुण विज्ञान की परिभाषा, महत्व, प्रयोजन और विभाग

द्रव्यगुण विज्ञान के सात पदार्थ–द्रव्य,गुण,रस,विपाक,वीर्य,प्रभाव एवं कर्म।

द्रव्य की परिभाषा एवं महत्व, पंचभौतिक संगठन एवं द्रव्यों का वर्गीकरण.–चेतन.अचेतन भेद से,कार्य.कारण भेद से,निष्पत्ति भेद से,योनि भेद से,प्रयोग भेद से,रस भेद से,वीर्य भेद से दोष कर्म भेद से।

द्रव्यों का नामकरण एवं विभाग का आधार-स्वरूपबोधक, अवयवबोधक, गुणबोधक, कर्मबोधक, देशबोधक एवं कालबोधक

Unit II- Rasa,Guna,Veerya,Vipak aur Prabhava ka varnana

रस की परिभाषा, भेद एवं पंचभौतिक संगठन।

गुण की परिभाषा एवं भेद, गुर्वादीगुणों का चिकित्सा में महत्व का विस्तार में वर्णन करे ।

विपाक की परिभाषा एवं भेद।
वीर्य के अध्ययन हेतु प्रयोगात्मक प्रणाली।
प्रभाव का महत्व एवं उपयोगिता।

Unit III-Vividh Gana vivechan

त्रिफला, मधुर त्रिफला, सुगन्धत्रिफला, स्वल्पत्रिफला, त्रिजात, चतुर्जात, त्रिकटु, पंचकोल, पंचपल्लव, पंचवल्लकल, त्रिकण्टक, चतुर्भद्र, त्रिकार्षिक, लघुपंचमुल, वृहत्पंचमूल, तृणपंचमूल, षडूषण, चतुरूषण, कण्टकपंचमूल, चर्तुबीज, पंचक्षीरीवृक्ष, मध्यअपंचमूल, चतुर्बीज, पंचक्षीरीवृक्ष, मध्यमपंचमूल, जीवनपंचमूल, मधुरत्रय, अम्लपंचक, महापंचविष, उपविष, अष्टवर्ग, पंचपल्लव।

Unit IV-Karma -कुछ प्रमुख तथा सामान्य कर्मों का विवेचन

दीपन, पाचन, ग्राही, स्तम्भन, भेदन, रेचन, अनुलोमन, सस्रंन, संशोधन, रसायन, वाजीकरण, व्यवायी, मदकारी, विकासी।
स्वेदन, स्वेदनोपग, स्नेहन, स्नेहनोपग, वमन, वमनोपग, विरेचन, विरेचनोपग ।

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

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

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

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

25 वनौषधि द्रव्यों की Herbarium sheets का निर्माण which will be collected from the field visits

अर्जुन अश्वगन्धा आमलकी बिल्व भृंगराज धतूरा एला गूडुची
हरीतकी हरिद्रा ज्योतिष्मती करंज कुमारी मण्डूकपर्णी पाठा
चन्दन कण्टकारी वाराहीकन्द खदिर निर्गुण्डी निम्ब मरिच मंजिश्ठा
पिप्पली सारिवा शतावरी शँखपुष्पी तुलसी

Text Books:

1. Dravyaguna vijana; by Dr. Mansi Deshpandey, Chaukhamba Sanskrit Pratisnthana, New Delhi.
2Dravyaguna 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

BPA-105 COMPUTER AND ITS APPLICATIONS IN PHARMACEUTICAL SCIENCES

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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)

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.

Unit IV

Ms Office Package:

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).

Reference Book

1. Sinha PK, Sinha P. Computer Fundamentals. New Delhi: BPB Publications.

2. Rajaraman V. Fundamental of Computers. New Delhi: Prentice Hall (India).

Text Books:

1. Sinha PK, Sinha P. Computer Fundamentals. New Delhi: BPB Publications.

2. Rajaraman V. Fundamental of Computers. New Delhi: Prentice Hall (India).

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

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
0	0	3	1	40	60	100	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 Practicals:

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

HS 102 ENVIRONMENTAL SCIENCE

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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 Environment and Biodiversity

Definition; Natural and manmade environments and inter-relationships amongst and between them, components of environment and relationship between different components, Relationship between man and environment, impact of technology on environment, environmental degradation.

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

Unit-II

Environmental Pollution: ***Air Pollution****:*Composition of air, structure of atmosphere, ambientair quality standards, classification of air pollutants, sources of common air pollutants like SPM, SO_2, NOX, natural and anthropogenic sources, effects of common air pollutants, carbon credit.

Noise Pollution: Introduction, sources of noise pollution, ambient noise levels, effects of noise pollutionon human being and wildlife, noise pollution controls, noise standards.

Water Pollution: Introduction, water quality standards, sources of water pollution, classification ofwater pollutants, effects of water pollutants, eutrophication, and measures to control water pollution.

Unit-III

Energy Resources: Understanding natural resources, renewable and non-renewable resources,sustainable energy resources, destruction versus conservation, forest resources, water resources, food resources, energy resources and land resources, conventional energy sources and their problems, advantages and limitations non-conventional energy sources, problems due to overexploitation of energy resources.

Unit-IV

Social Issues and Environment: Sustainable development and practices of improvingenvironment, laws

and acts for environmental protection, waste management.

Text Book:

1. Nebel BJ, Wright RT. Environmental science – the way the world works. New Jersey: Prentice Hall.

Reference Book:

1. Botkin DB, Keller EA. Environmental science. New York: John Wiley & Sons.

HS- 101 ENGLISH COMMUNICATION SKILLS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

Need for Communication

Need for effective communication, The Seven Cs of Effective Communication- Completeness, Conciseness, Consideration, Concreteness, Clarity, Courtesy, and Correctness.

Barriers to Communication: Miscommunication, Physical Noise and Overcoming measures.

Unit-II

Review of English Grammar (theoretical concepts)

Sentence Structure; Sentence formation, Use of appropriate diction, Tenses and Prepositions.

English Phonetics: International Phonetic Alphabets -Classification of consonant and vowel sounds; Mechanism of Production.

Unit-III

Writing Skills

Technical Writing: Differences between technical and literary style, Elements of style; Common Errors.

Letter Writing: Formal, informal and demi-official letters; business letters.

Resume Writing: Differences between bio-data, CV and Resume, cover letter, application for job.

Unit-IV

Soft skill development

Soft skills: First Impressions, Attire, Capturing Audience, Tone, Behavior and Telephone Etiquette -Good practice when making and receiving a call, Leaving a message on a voicemail.

Development of Soft skill: Becoming a good leader and team-player.

Text Books:

1. Herta A. Murphy, et al., Effective Business Communication, Tata Mc-Graw Hill: New Delhi
2. Krishna Mohan and Meenakshi Raman, Effective English Communication, TMH

Reference Books:

1. R.W.Lesikar and John.D. Pettit, Business Communication: Theory and Application, All India Traveller Bookseller .
2. Francis Soundaraj, Speaking and Writing for Effective Business Communication, Macmillan.
3. Ronald B. Adler and George Rodman, Understanding Human Communication, Oxford University Press: New York

SEMESTER-II

SEMESTER- II

BPA-201 PHARMACEUTICAL BIOLOGY

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

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

Unit -II

General morphology of plants with special reference to external features of flowers (types of flowers-unisexual, bisexual, hermaphrodite and inflorescence), fruit and its types, seeds (monocot and dicot), barks, roots (tap root and adventitious root system), woods (hard and soft woods)and leaves(apexes, margins, venations, types)

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.

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*. 15thedn., 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 16th Edn. Nirali Prakashan, Pune, India.

BPA-211 (P) PHARMACEUTICAL BIOLOGY

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
0	0	3	1	40	60	100	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:

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
7. 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* 36th edn. Nirali Prakashan, Pune, India.

Reference Books:

1. Evans WC (3002): *Trease and Evan's Pharmacognosy*. 15thedn., 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 16th Edn. Nirali Prakashan, Pune, India.

BPA-202 PHARMACEUTICAL CHEMISTRY- ORGANIC AND INORGANIC CHEMISTRY

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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 moleculer hydrogen bonding, ionic and covalent bonding in chemical compounds.

b.)**Aliphatic Compounds**

Structure, nomenclature, preparation and reactions of alkanes andStructure, 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).

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.

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.

BPA-212 (P) **PHARMACEUTICAL CHEMISTRY- ORGANIC AND INORGANIC CHEMISTRY**

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
0	0	3	1	40	60	100	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:

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
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. 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			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

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.

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*. 15th 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.

BPA-204 PHARMACEUTICS (GENERAL AND DISPENSING PHARMACY)

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

Introduction and Scope of the Profession and Metrology

Introduction and scope of pharmacy profession, official compendia and its uses in pharmacy profession.

Introduction to units of weights and volume in metric systems, imperial systems and SI system. Simple calculation involved in preparing solutions of solids in liquids (W/V), liquids in liquids (V/V), Method of allegation.

Unit II

Monophasic Liquid Dosages Formulations:-

Formulation, characteristics, manufacturing procedure including examplesof internal and external monophasic dosages form. Official pharmaceutical solutions, products for oraland topical use including mixture, syrups, elixirs, mouth washes, gargles, throat paints, aromatic waters, lotions and liniments, Douches, nasal and ear drops. Evaluation of monophasic liquid dosages formulations.

Unit III

Powder dosage forms

Official standards for powders as per IP/API, sieves and their usage in grading, bulk powders for internal and external use. Special powderDusting powders and insufflations, single dose powders, effervescent powders, hygroscopic powders, Efflorecent powders, Eutactic Mixture and granules. Evaluation of powder dosage form.

Unit IV

a)Prescription

Description and parts of a prescription, handling the prescription, reading the prescription, checking the written prescription, compounding the prescription.

b)Incompatibilities:-

Classification, Types and examples ofPhysical incompatibilities, Chemical incompatibilities and Therapeutic Incompatibilities.

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.

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, 11th and 12th edition, 1967 and 1975, Pitman Books Ltd., London, U.K.

BPA-205 RAS SHASTRA-I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

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.

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

BPA-213(P) RASA SHASTRA-I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
0	0	3	1	40	60	100	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:

1. To study the classification of different Rasa Dravya.
2. To study the identification of different drugs of Maharasa group.
3. To study the identification of different drugs of Uparasa group.
4. To study the identification of different drugs of Sadharanarasa group.
5. To study the identification of different drugs of Dhatu-Upadhatu group.
6. To study the identification of different Heat appliances used in Ayurvedic Drug preparation.
7. To study the Plan of Pharmacy.
8. To study the practical aspect of Shodhana.
9. To study the practical aspect of Bhavna and mardana.
10. To study the various classical tests and parameters of avialable 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, 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 Sar Sangraha.
5. Rasa Tantra Sara avum Siddha Prayog Sangraha, Sri Krishan Gopal Bhawan Kaleda, Rajasthan.

HS-201 BUISNESS COMMUNICATIONS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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.
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UNIT - I

Introduction to Business Communication: Importance of communication in business, processand models of communication, Types of information- order, advise, suggestion, motivation, persuation, warning and education.

UNIT- II

Business Communication: Written Communication: Letters, Cover Letter, Differencesbetween bio-data, CV and Resume, Letter for Job Application, Thank You Letter, Letter of Complaint, Memos, Memorandum drafting. E. Communication: Email, Social Media, Website Copy and Reports.

Oral Communication: Types of oral communication, Barriers to oral communication, MassCommunication – Nature & Scope of Mass Communication, function of mass communication – Media of mass communication.

UNIT-III

Business Report Writing: Report Writing: Types, Structure of a report, Methods and Modelsof Report Writing, Technical Proposal- Concept, Kinds, Layout, and Examples of Technical Proposals.

Types of reports: Progress reports, routine reports–Annual reports–format–Analysis ofsample reports from industry – Synopsis and thesis writing.

UNIT IV

Spoken and Presentation Skills: Impromptu speech–tackling hesitation, shyness andnervousness in speaking –Public speaking, academic and professional presentations – Group discussions – facilitators and impediments Planning, preparing and delivering a presentation,

essentials of presentation - etiquette, clarity, lively delivery – speech rhythm, speech initiators body language – voice, posture & gesture, eye contact, dress codes. Speech Drill, Interviewing, Negotiating a job offer.

Text Books:

1. Essentials of Business Communication by R. Pal and JS Korlahhi, Sultan Chand & Sons, New Delhi.
2 Basic Communication Skills for Technology by Andre J. Rutherford, Pearson Education Asia, patparganj, New Delhi 92.

Reference Books:

1. Business Communication by Meenakshi Raman and Prakash Singh (Oxford)
2. Advanced Communication Skills, V. Prasad, Atma Ram Publications, New Delhi.

HS 103-Disaster Management

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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.
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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.**(6 Hrs)**

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. **(6 Hrs)**

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, Deforestation, Timber extraction, Mining, Dams and their effects on forest and tribal people.**(6 Hrs)**

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. **(6 Hrs)**

TEXT BOOKS:

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.

SEMESTER-III

Semester- III

BPA-301 DRAVYA GUNA VIGYAN II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

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. 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, New Delhi.
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.

BPA-311P DRAVYA GUNA VIGYAN II

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

Note:

Practical's 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 30 herbarium specimen from field visit.

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 Indian Medicinal Plants by K.R.Kirtikar and B.D.Basu.
4. The Ayurvedic Pharmacopoeia of India, Govt of India Publication.

BPA-302 PHARMACOGNOSY OF AYURVEDIC DRUGS – I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

Systematic study of Crude drugs (Synonym, Biological source, Chemical constituents, uses, substitutes, pharmacology etc.) andfactor 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.

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

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

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*. 15thedn., 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.

BPA-312P PHARMACOGNOSY OF AYURVEDIC DRUGS – I

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

1. To prepare chemomicroscopic reagents like Glycerine–water, safranin, sudan–iii, phloroglucinol, iodine water, chloral hydrate solution, picric acid solution etc.
2. To carry out Morphology of leaves including leaf margins, venations, types.
3. To carry out Morphology study of Dhanyaka.
4. To carry out Morphology study of Khadir.
5. To carry out Morphology study of Amalaki.
6. To carry out Morphology study of Ashoka Twak, Haritki.
7. To carry out T.S. Microscopy of Guduchi.
8. To carry out T.S. Microscopy of Lavang.
9. To carry out T.S. Microscopy of Misreya.
10. To carry out extraction of some drugs by various methods studied in theory.
11. Study of Leaf characters like trichomes and stomata few drugs listed in the theory.
12. To carry out extraction of volatile oilscontaining drugs listed in the theory.

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*. 15thedn., 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.
4.S.S HandaTextbook of Pharmacognosy Vallabh Publications, New Delhi.

BPA-303 PHARMACEUTICS – PHYSICAL PHARMACY

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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) Introduction of 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.

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

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

Viscosity and Rheology

Concept of viscosity, Newtonian systems, Law of flow, factors affecting viscosity, Non-Newtonian systems: plastic flow, pseudo plastic flow, dilatants flow, thixotropy and its measurement, negative thixotropy, spur and bulges.

Determination of flow property:-Viscometers: capillary, falling sphere, Brookfield Viscometer, cup and bob viscometer and cone and plate viscometer.

Unit-IV

a) Suspensions

Suspension and its classification, advantages and characteristics of an ideal suspension, Interfacial properties of solids, formulation, preparation of suspensions.

b) Emulsions

Classification and advantages of emulsion, appearance and identification test, emulsifying agents, physical instability problem, factors which improve physical stability of emulsion and preparation of emulsion.

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.

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

BPA-313P PHARMACEUTICS – PHYSICAL PHARMACY

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
0	0	3	1	40	60	100	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:

1. Determination of refractive index of Ayurvedic formulations by Abbe's refractometer.
2. Determination of refractive index of Ayurvedic formulations by Hand's refractometer
3. Determination of viscosity of liquids by Ostwald Viscometer.
4. Determination of density, specific gravity of Ayurvedic formulations.
5. Determination of bulk density and tapped density of Ayurvedic formulations.
6. Determination of angle of repose of Ayurvedic formulations.
7. To prepare and dispense the biphasic liquid dosage form (Emulsion).
8. To prepare and dispense the coarse dispersion (Suspension).
9. Determination of thickness and diameter of tablet, Vatti, Guttika by screw gauge or vernire caliper.
10. Determination of Hardness of Ayurvedic tablets by Monsanto hardness tester.

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

BPA-304 **PHARMACOLOGY-I**

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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: Definition, scope and development of pharmacological thought (historical development). ADME: Drug absorption, bioavailability, bioequivalence, route of drug administration, Plasma protein binding, half life of drug, biotransformation and cytochrome P450 monooxygenase system and excretion of drug. Molecular Pharmacology: Molecular mechanisms of drug action, receptors, theory of receptors, dose response relationship. Affinity constants, potentiation, antagonism phenomenon.

Unit II

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

Unit III

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

Unit IV

Local anaesthetics- Classification, mechanism of action, adverse effects, contraindications).
In-vivo Synthesis of Histamine and antihistamine- Classification, mechanism of action, adverse effects, contraindications

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

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

BPA-305 RAS SHASTRA-II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

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.

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.

BPA-314 P RAS SHASTRA-II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
0	0	3	1	40	60	100	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.
5. Rasa Tantra Sara avum Siddha Prayog Sangraha, Sri Krishan Gopal Bhawan Kaleda, Rajasthan.

BPA-306 APPLIED PHYSIOLOGY

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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)General Physiology: Cell, Membrane Potential, Blood: Blood Composition, Homeostasis, Coagulation of Blood, Bleeding disorders, Dhatu poshan nayaya.

b)Respiratory system: Control of ventilation, Carriage of O_2 and CO_2 by blood and their exchange at tissue level, Ayurvedic concept of Respiration.

Unit II

a) C.V.S.: Physiology of Circulatory Shock, Postural Hypotension, Arteriosclerosis, Angina cardiac. Ayurvedic concept of cardiovascular system.

b)C.N.S: Extrapyramidal tracts, Reticular activating system, Epilepsy, Mental Depression.Ayurvedic concept of central nervous system.

Unit III

a) Endocrines: Physiology of Hypo and Hyper function of Endocrine glands (pituitary gland, thyroid, adrenal). Ayurvedic concept of endocrines.

b)Metabolism: Physiology of BMR, LFT, Nutrition (diet and routine), Vitamins (lipid and water soluble vitamins).Ayurvedic concept of metabolism.

Unit IV

a)Excretory system: Acidosis, Alkalosis, Serum Electrolyte, Acid Base Balance, Ayurvedic concept of Urine formation

b)Reproductive system: Male and female reproductive systems, menstrual cycle and concept of family planning with focus on latest developings.

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. 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

BPA-315 P APPLIED PHYSIOLOGY

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

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

List of experiments:
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 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. 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

SEMESTER- IV

BPA-401 PHARMACEUTICAL ANALYSIS OF AYURVEDIC DRUGS-I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

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.

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

BPA-411 P PHARMACEUTICAL ANALYSIS OF AYURVEDIC DRUGS-I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
0	0	3	1	40	60	100	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:

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

HS-402 HUMAN VALUES AND PROFESSIONAL ETHICS

Teaching Scheme			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 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.

Module 1

Course Introduction -Need, Basic Guidelines, Content and Process for Value Education.

1. Understanding the need, basic guidelines, content and process for Value Education
2. Self Exploration-what is it?- its content and process; Natural Acceptance
3. Continuous Happiness and Prosperity- A look at basic Human Aspirations
4. Right understanding.
5. Understanding Happiness and Prosperity correctly- A critical appraisal of the current status.

Module 2

Understanding Harmony in the Human Being - Harmony in Myself!

6. Understanding human being as a co-existence of the sentient T and the Material 'Body'
7. Understanding the needs of Self (T) and 'Body* - Sukh and Suvidha
8. Understanding the Body as an instrument of T (I being the doer, seer and enjoyer)
9. Understanding the characteristics and activities of T and harmony in T

Module 3

Understanding Harmony in the Family and Society- Harmony in Human-Huma Relationship

10. Understanding harmony in the Family- the basic unit of human interaction
11. Understanding values in human-human relationship: meaning of Nyaya and Program for its fulillment to ensure Uhhay-tripfi: Trust (Vishwas) and Respect {Sammanj as thefoundation values of relationship
12. Understanding the meaning of Vishwas; Difference between intention and competence

Module 4

Understanding Harmony in the Nature and Existence-Whole existence as C existence

13. Understanding the harmony in the Nature
14. Interconncctcdness and mutual fulillment among the four orders of nature– Recyclability and self- regulation in nature.
15. Understanding Existence as Co-existence (Sah-asfitva) of mutually interacting units in All pervasive space

Text Books:

1. The text book: R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Huma Values and Professional Ethics, Excel Books Private Limited, New Delhi.

2. Teacher's manual: R R Gaur. R Sangal, G P Bagaria. 2009, Teacher's Manual: A Foundatio Course in Human Values and Professional Ethics. Excel Books Private Limited. New Delhi.

Video CD of Teacher Orientation Workshop will be made available on website.

1.Reference Books

1. Ivan Illich,1974, Energy & Equity. The Tinity Press, Worcester, and HarperCollins, USA

2. E.F. Schumacher, 1973, Small is Beautful: a study of economics as fpeople matterec Blond & Briggs, Britain.

3. Sussan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991

4. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Bchrens III. 197 Limits to Growth - Club of Rome's report. Universe Books.

5. A Nagraj, 1998, Jeevan Vidya ek Parichay, Divya Path Sansthan, Amarkantak.

6. P L Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Purblishers.

Relevant websites, CDs, Movies and Documentaries

1. Value Education website, http://www.uptu.ac.in
2. Story of Stuff, http://www.storyofsiuf.com
3. Al Gore, An Inconvenient Truth. Paramount Classics, USA
4. Charlie Chaplin, Modern Times. United Artists, USA
5. IIT Delhi. Modern Technology - the Untold Story
6. Anand Gandhi, Right here right now. Cyclewala production

BPA-402 PHARMACOGNOSY OF AYURVEDIC DRUGS-II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

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, 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* 36th edn. Nirali Prakashan, Pune, India.

Reference Books:

1. Evans WC (3002): *Trease and Evan's Pharmacognosy*. 15th 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.
4. S.S HandaTextbook of Pharmacognosy Vallabh Publications, New Delhi

BPA-412 P PHARMACOGNOSY OF AYURVEDIC DRUGS-II

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

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* 36th edn. Nirali Prakashan, Pune, India.

Reference Books:

1. Evans WC (3002): *Trease and Evan's Pharmacognosy*. 15thedn., Saunder' Elsevier Pvt Ltd. New Delhi-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.
4. S.S HandaTextbook of Pharmacognosy Vallabh Publications, New Delhi.

BPA-403 PHARMACEUTICS - PRINCIPLES OF PHARMACEUTICAL OPERATIONS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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) 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.
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) Basic laws of 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. Subrahmanyam 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.

BPA-404 RAS SHASTRA - III

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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) 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.

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
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.

BPA-413 P RAS SHASTRA - III

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
0	0	3	1	40	60	100	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:

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

BPA-405 DRAVYA GUNA VIGYAN – III

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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 8. Shankha 9.Shukti10. Shambuka 11. Varatika 12.Indragopa
Introduction, knowledge of guna-karma of following groups of Annapanavarga:-1. JalaVarga 2. 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 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. 2 .Database on medicinal plants used in Ayurveda by CCRAS,New Delhi.
3 .Indian Medicinal Plants by K.R.Kirtikar and B.D.Basu.

BPA-414 P DRAVYA GUNA VIGYAN – III

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

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.

BPA-515: INDUSTRIAL TRAINING

L	T	P	Credits, assigned	
-	-	-	**2**	

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 4th semester either in one stretch or two stretches during end semester vacations.

SEMESTER- V

BPA-501 **PHARMACOGNOSY-II**

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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)*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 Drug**s**:--***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 Colchicum***g***. **Saponin containing drugs**: Senega, Dioscorea***h.*Cardioactive drugs**: Squill, Strophanthus, Thevetia.***i*Anthraquinone cathartics**: Rhubarb and Cascara***j***. **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 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.

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. New Delhi-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.

BPA-502 PHARMACEUTICAL ANALYSIS OF AYURVEDIC DRUGS – II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

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.

Text Books:

1. Kemp W. Organic Sepctroscopy: London: ELBS / WH Freeman & Co.
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: Franklin Book Co.
4. A text book of *'Pharmacognosy'* by R.K. Parmar, Vol.I, Edn.-I, P.Prakashan, India.

BPA-511 P PHARMACEUTICAL ANALYSIS OF AYURVEDIC DRUGS – II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
0	0	3	1	40	60	100	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 $R_f$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 rotationof 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: 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: Franklin Book Co.
4. A text book of *'Pharmacognosy'* by R.K. Parmar, Vol.I, Edn.-I, P.Prakashan, India.

BPA-503 PHARMACEUTICAL TECHNOLOGY FOR AYURVEDIC DRUGS-I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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:

Essential characteristics, type, formulation, labeling, container of ophthalmic products-Eye drops, eye lotion, eye ointments, eye suspensions, 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.

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/Churchill Livingstone.

2. Banker GS, Rhodes CT. Modern Pharmaceutics. New York: Marcel Dekker.

3. Rawlins EA. Bentley's Textbook of Pharmaceutics. London: ELBS.

BPA-512 P PHARMACEUTICAL TECHNOLOGY FOR AYURVEDIC DRUGS-I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
0	0	3	1	40	60	100	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:

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

BPA-504 DRAVYAGUNA VIGYANA – IV

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

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 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-

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.

BPA-513 P DRAVYAGUNA VIGYANA – IV

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

Note:
Practical's 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 30 herbarium specimen from field visit.
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 .Indian Medicinal Plants by K.R.Kirtikar and B.D.Basu
4. Medicinal Plants of Himachal Pradesh by Dr. N.S. Chauhan Minerva Publications.

BPA-505 RASSHASTRA -IV

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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) 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.

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.

BPA-514 P RASSHASTRA -IV

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
0	0	3	1	40	60	100	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:

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

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.

SEMESTER- VI

BPA-601 PHARMACEUTICAL ENGINEERING

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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) Size reduction

Advantages, mechanism, stress applied in size reduction, selection of mill, classification of size reduction equipment, principle, construction, working, use of Rotary cutter mill, Roller mill, Hammer mill, Ball Mill, Fluid energy mill, Colloid mill, Edge runner mill and end runner mill.

b) Size separation

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

Unit-II

Drying

Application, theory of drying, bound and unbound moisture, critical and equilibrium moisture content, rate relationship, 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 and condensation:

Application, theory of distillation including ideal and non ideal solutions, estimation using simple laws Raoult's law, Dalton's law, Classification of distillation equipments.

Equipments: Principle, construction, working, use of Differential distillation, vacuum distillation, flash distillation, fractional distillation, azeotropic distillation, steam distillation .

Unit-IV

Crystallization:

Application, Characteristics of crystals, mechanism of crystallization, Mier's supersaturation theory, Caking of crystals, factors affecting caking and prevention of caking.

Equipment: construction, principle, working, use of Agitated batch crystallizer, Swenson walker crystallizer, Krystal crystallizer, vacuum crystallizer.

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. Subrahmanyam CVS. Pharmaceutical Engineering. New Delhi: Vallabh Prakashan.

Reference Books:

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.

BPA-602 PHARMACOLOGY & TOXICOLOGY OF AYURVEDIC DRUGS-1

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

General introduction to pharmacology and its role in the field of Ayurveda. Nature and source of drugs. Routes of drug administration such as intravenous, intra-muscular, intra-theccal, intra-dermal, intra-nasal, intra-rectal, subcuteanous, intra-arterial, intra-spinal, intra-articular, intra-ocular etc. Mechanism of Drug transport (active and passive) and storage.

Unit II

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 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

Type of drugs for the treatment of GI tract diseases. Appetizers, Digestants, carminatives, Emetics, anti-emetics. Laxative & anti-diarrhoeal, Pharmacotherapy of peptic ulcer. General principles of clinical toxicology including insecticide poisoning, heavy metal poisoning, barbiturate poisoning, narcotic drug poisoning.

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

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

BPA-603 BHAISHAJYA KALPNA - II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

Manaparibhasa

Classification of mana, payya mama, druvaya mana, putava mana, kala mana, Magadha mana, 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

Ausadhakalpana

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

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.

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, 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.

BPA-611 P BHAISHAJYA KALPNA - II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
0	0	3	1	40	60	100	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 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, 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.

BPA-604 PHARMACEUTICAL MICROBIOLOGY

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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, History and Scope of Microbiology, Microscopies, their magnification, resolution, illumination and filters, working of different types of microscopes(simple, compound, eclectron), micrometry.

Unit II

Classification of microbes and their taxonomy – Protozoa, fungi, actinomycetes, bacteria, ricketssia spirochaetes and viruses. Nutrition, cultivation, isolation and identification of bacteria, actnomycets, fungi, viruses. Bacterial enzymes.

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

Microbial attach and host defence, virulence and pathogenicity, primary and specific defensive mechanisms of body (humoral and cell mediated), infection and its transmission, interferon's. Applications of microbiology in Ayurvedic Pharmacy.

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.

BPA-612 P PHARMACEUTICAL MICROBIOLOGY

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
0	0	3	1	40	60	100	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:

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.

BPA-605 PHARMACOGNOSY –III

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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) 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 papcreatin.

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. Concept of animal ethical committee and its guidelines.

b) Study of Plant pesticides including rodenticides, nematicides, insecticides, fungicides. Herbs as health foods and cosmoceuticals.

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.

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. New Delhi-24, India.
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.

BPA-613 P PHARMACOGNOSY –III

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

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.
4. To carry out TLC studies of some Ayurvedic drugs/formulations/volatile oils etc. listed in API
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 some some drugslisted in API.
12. To carry out isolation of volatile oil and carry out solubility test, refractive index, TLC profile of the oil obtainedcamphor, 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*. 15thedn., 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.

4. Medicinal Plants of Himachal Pradesh by Dr. N.S. Chauhan Minerva Publications.

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

BPA-606 PHARMACOLOGY –II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

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.

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).

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

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

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 6th semester either in one stretch or two stretches during end semester vacations

SEMESTER- VII

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

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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.

Forensic Pharmacy - Acts, Rules & Regulations –

Unit-I

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

Drugs and Cosmetics Act and rules:- Introduction, definition, schedule to act and rule, import and registration of drugs and cosmetics, manufacturing of drug specified in schedule C, 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, import, export of narcotics and drugs and Psychotropic drugs.

Pharmacy Act:-Introduction, definition, PCI, State pharmacy councils, Registration of pharmacist.

Pharmaceutical Management:-

Unit-III

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

Personnel Management:-Objective, function of personnel management, recruitment, selection process, service condition, performance evaluation of personnel management.

Unit-IV

Channels of Distribution: –Direct and indirect selling, types of middelman, wholesalers, retailers, modern trends in retailing,retail departmental store, chain stores, mail order busines.

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

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.

BPA-702 PHARMACEUTICAL TECHNOLOGY FOR AYURVEDIC DRUGS- II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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, factors consideration such as physiological properties and biological properties and 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, factors affecting liposomes, stability of liposome including accelerated stability testing, evaluation of liposomes, commercial manufacturing and scaleup of liposomes.

Unit-III

a.)Microsphere:

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

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

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/Churchill Livingstone.
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.

BPA- 711P PHARMACEUTICAL TECHNOLOGY FOR AYURVEDIC DRUGS- II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
0	0	3	1	40	60	100	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:

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/Churchill Livingstone.

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.

BPA-703 PHARMACOLOGY & TOXICOLOGY OF AYURVEDIC DRUGS –II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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.

Unit II

Drugs used in the treatment of cardiovascular system. Pharmacotherapy of hypertension. Pharmacotherapy of arrhythmia. Pharmacotherapy of cardiac failure. Pharmacotherapy of angina pectoris.

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. Concept of Essential Drugs and Rational Drug use.Drug Addiction and Drug Abuse

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

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

BPA-704 PHARMACEUTICAL ANALYSIS OF AYURVEDIC DRUGS-III

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

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.

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: 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: Franklin Book Co.

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

BPA-712 P PHARMACEUTICAL ANALYSIS OF AYURVEDIC DRUGS-III

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
0	0	3	1	40	60	100	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.
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: 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: Franklin Book Co.
4. Kemp W. Organic Sepctroscopy: London: ELBS / WH Freeman & Co.

BPA-705 BHAISHAJYA KALPNA –III

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

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, standaridation of raw drug, 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. In-process 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:

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

BPA-713 P BHAISHAJYA KALPNA –III

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
0	0	3	1	40	60	100	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 prepare Narikela lavana.
2. To prepare Arka lavana.
3. To prepare Hastidanta masi.
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, 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.

BPA-706-I YOGA

Teaching Scheme			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 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.

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

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.

BPA-714-I P YOGA

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

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.

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.

BPA-706-II AFI

Teaching Scheme			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 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.

BPA-714-II P **AFI**

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

Note:
Practical's as per topics in the syllabus for the course will be conducted in the laboratory class. Prepation of different formulations mentioned in AFI.

Text Books:

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

BPA-706-III AYURVEDIC COSMETICS

Teaching Scheme			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 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:

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

Reference Books:

1. Database on medicinal plants CCRAS.

BPA-714-III P AYURVEDIC COSMETICS

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

Note:

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

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:

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

Reference Books:

1. Database on medicinal plants CCRAS.

BPA-706-IV MARKET MANAGEMENT

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
3	2	0	4	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

The motivation and Behaviour of individuals and groups in organizations. The principles and Models of HRM and Personnel Management.

Unit II

The Effective Recruitment, Selection, Appraisal and Reward of Employees. The Issue of Control and Effective handling and Management of Employee Grievances and Discipline

Unit III

The Identification of Training and Developmental needs, Continuous Professional Development, lifelong learning and Personal Development.

Unit –IV

Employee Representation, Participation, Commitment and Involvement. Labour laws as applicable to industries in India

SEMESTER-VIII

BPA-801 MEDICINAL CHEMISTRY

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

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, drug resistance, and synergism 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

a)Aminoglycosides and other antibiotics effective mainly against Gram –negative organisms.

b)Penicillins and other antibiotics effective mainly against Gram –negative organisms.

Unit IV

a)Antineoplastic agent and Antiviral agents- Introduction to DNA, RNA and retroviruses, viral replication, interferone.

b) Cephalosporins, Tetracyclines and other antibiotics effective against both gram +positive and gram –negative organisms.

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 Pharmaceutical Chemistry. 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

BPA-802 PHARMACEUTICAL ANALYSIS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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.
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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

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

Text Books:

1. Lee, DC. Pharmaceutical Analysis. London: Blackwell.
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: Franklin Book Co.
4. Kemp W. Organic Sepctroscopy: London: ELBS / WH Freeman & Co.

BPA-811P PHARMACEUTICAL ANALYSIS

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

1. Identification of Amino acids by Ascending Paper Chromatography.
2. Separation of Amino acids by Ascending Paper Chromatography.
3. Identification of sugars by Thin Layer Chromatography.
4. Separation of sugars by Thin Layer Chromatography.
5. Separation of active principle of Drug (Sumo) by Thin Layer Chromatography.
6. Identification of active principle by comparing with standard Drug.
7. Moisture Analysis in powder drugs.
8. Measurement of Optical activity in different drugs.
9. Mesurement of Refractive Index.
10. Determination of pH of various Extract.

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 Press of 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 C0., London, 1974.

BPA-803 BHAISHAJYA KALPNA–IV

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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

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

b)Mukha kalpana

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.

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, post-vasti 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, 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.

BPA-812 P BHAISHAJYA KALPNA–IV

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

Note:

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

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, Chaukhamba Sanskrit 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.

BPA-804 PHARMACEUTICS- PHARMACOKINETICS AND BIOPHARMACEUTICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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.)Introduction Introduction to biopharmaceutics and pharmacokinetics, Fate of drug in the body. Experimental models of pharmacokinetics studies, 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 drug-pharmaceutical 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 and distribution coefficient, pharmacokinetics parameters 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:

a.) Bioavailability: Objective, consideration and measurement of bioavailability by both methods pharmacokinetics and pharmacodynamic methods, Biopharmaceutics drugs classification System, Method of enhancement of bioavailability.

b.) Bioequivalence: Objective, Application of Bioequivalance Studies, general principles of bioequivalence, Criteria for bio equivalence requirement, Methodology for bioequivalence studies: - Objective of study, Study Subjects, Study design and conduct of study.

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 correlations.

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

1. Brahmankar DM, Jaiswal SB. Biopharmaceutics and Pharmacokinetics – A Treatise.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.

BPA-805 CLINICAL PHARMACY

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Examination	Total	
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 InteractionsFactors- 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.

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.

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. 2nd edition, 3989.

2.N.Thakur Lecture on Clinical Pharmacy, P.Prakashan, India

Reference Books:

1. R.emington, The Science and Practice of Pharmacy, 19th 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, 4th edition, London, 1988.

BPA-813 PROJECT WORK

L	T	P	Credits, assigned	
-	-	-	**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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