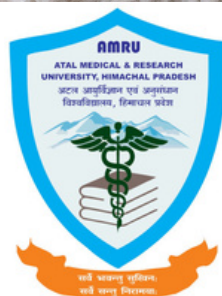


Syllabus for B. Pharmacy (Ayurveda) Programme



Atal Medical & Research University

A state University established by the Govt of H.P

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**ATAL MEDICAL & RESEARCH
UNIVERSITY, HIMACHAL PRADESH**

ਅੰਮ੍ਰਿਤ ਯੂਨੀਵਰਸਿਟੀ ਆਫ਼ ਮੈਡੀਕਲ
ਅੰਮ੍ਰਿਤਸਰ, ਪੰਜਾਬ

B.PHARMACY (AYURVEDA)

SYLLABUS



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

Unit II

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

Unit III

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

Unit IV

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

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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.

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BPA 102 Fundamentals of Anatomy and Physiology

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D		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 Human body – Definition and scope of anatomy and physiology, General introduction to human body, Structure and function of cell, Basic tissues and their functions (Epithelial, Connective, Muscular and Nervous.)

Unit II

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

Unit III

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

Unit IV

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

Text Books:


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


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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.




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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	25	25	50	3 hrs

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

List of experiments:

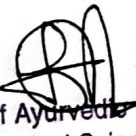
1. Introductory study of human skeleton.
2. Study of humerus, tibia fibula, scapula, vertebra.
3. Study of different systems with the help of charts and models.
4. Study of preserved human organs.
5. Recording of body temperature, pulse rate and blood pressure.
6. HB estimation, BT, CT, ESR recording.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



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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.


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Unit I

History of Bhaishajya Kalpana and its gradual development

Bhaishajya kalpana utpatti, Bhesaja, 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.

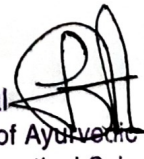
Unit IV

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, patalayantra, khalvayantra, saravasamputa importance of size reduction, mechanisms of grinding machines, disintegrator, cutter mill, roller mill, hammer mill, end runner mill, capsule filling machine, automatic capsule filling machine, rotary tablet machine, coating pan, Monsanto hardness tester, tablet disintegration test apparatus, simple distillation apparatus, hot-air oven.

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

Text Books:


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1. Text book of Bhaishajya Kalpana Vigyana (A Science of Indian Pharmacy) by Dr. K.RamachandraReddy, Chaukhamba.

2. Text Book of Bhaishajya Kalpana Vigyana by Dr. Siddhinandana Mishra, Chaukhamba Sanskrit Bhawan, Varanasi.

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

Reference Books:

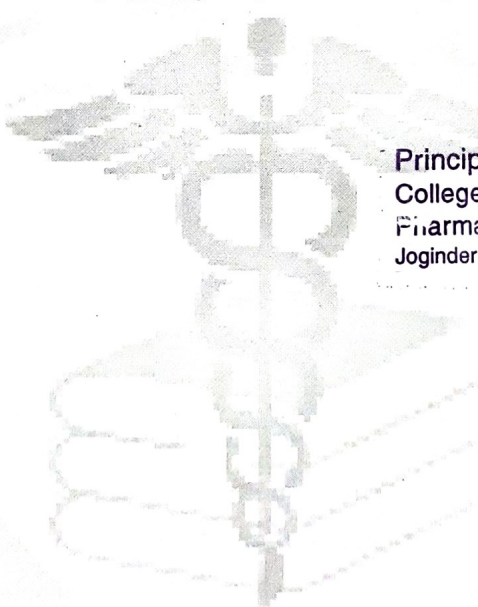
1. The Drugs & Cosmetics Act 1940.

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.

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



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BPA-104 FUNDAMENTALS OF DRAVYAGUNA VIGYANA – I

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

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

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


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

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

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

Unit III- Vividh Gana vivechan

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


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Unit IV-Karma –


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

Text Books:

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

Reference Books:

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


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

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

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


1. Planatation of herbal plant in college campus and creation of herbal garden.
2. Preparation of herbarium sheets by collecting 25 medicinal plants.

Text Books:

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

Reference Books:

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


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BPA 105 ENVIRONMENTAL SCIENCES

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

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

UNIT II

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

UNIT III

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

UNIT IV

Environmental Pollution: Air pollution; Water pollution; Soil pollution

Text books (Latest edition):

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

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BPA-106 COMPUTER AND ITS APPLICATIONS IN PHARMACEUTICAL SCIENCES

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).

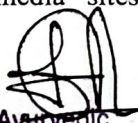
b) Operating System: Definition, Need and organization of OS, Functions performed by operating system. Type of Operating System. DOS, windows, Directories and files. Commands (internal & external). Icons, Clipboard. Folders, Major differences between a DOS and Windows.

Unit II

a) Data Communication and Networks: Basic elements of a communication system, Data transmission mode, Network Topologies (ring, star, fully connected and Bus), LAN and WAN, Bounded and unbounded communication media.

b) Internet Technology: Internet, Services provided by internet, Potential uses and abuses of internet, Working of search engine, Effective use of social media sites. Concept and implementation of E-Services (Digital India)

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Unit III

a) **Computer Virus:** Definition, Causes and symptoms of virus, Types of viruses, Detections, prevention and cure against viruses using antivirus software packages.

b) **Role of Computers in Pharmacy:** Use of computer in various pharmaceutical and clinical applications like drug information services hospital and community pharmacy, drug design, pharmacokinetics and data analysis.

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).

Text Books:

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


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

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

Note:


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

List of Practicals:

1. MS Word
2. MS Excel
3. Basic exercises of Internet
4. PowerPoint presentation
5. Basic exercises of spreadsheets
6. Basic exercises of E:mail
7. Basic exercises of searching databases related to Ayurvedic Pharmacy
8. Basic exercises of Paint
9. Basic exercises of preparing Pdf files
10. Basic exercises of converting doc files into one another

Text Books:

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


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BPA- 107 PHARMACEUTICAL BIOLOGY

Teaching 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

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

Unit -II

Morphology of Flowering plants: Morphology of different parts of flowering plants – Root, stem, inflorescence, flower, leaf, fruit, seed. General Anatomy of Root, stem, leaf of monocotyledons & Dicotyledones.

Unit -III

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

Unit -IV

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

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


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Text Books:

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

Reference Books:

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


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BPA-112(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	25	25	50	3 hrs

Note:

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

List of experiments:

1. To study different parts of leaves.
2. To study different parts of flowers.
3. To study different parts of fruits.
4. To study different parts of compound microscope.
5. To study different parts of binocular microscope.
6. To study different root systems
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: *Pharmacognosy* 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. Khandelwal KR (3006): *Practical Pharmacognosy Techniques and Experiments* 16th Edn. NiraliPrakashan, Pune, India.

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विश्वविद्यालय, हिमाचल प्रदेश



SEMESTER -II

SEMESTER- II
BPA-201 Introduction to Pharmacology

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

Unit -1

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

Unit -2

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

Unit -3

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

Unit - 4

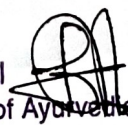
Adverse drug reactions, Drug interactions (Pharmacokinetic and pharmacodynamic). Drug discovery and clinical evaluation of new drug. Drug discovery phase, preclinical evaluation phase, clinical trial phase, phases of clinical trials and pharmacovigilance, Health education.

Text Books:

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

Reference Books:

1. Rang MP, Dale MM, Ritter 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. Lippincott's Illustrated Reviews -Pharmacology. Philadelphia: Lippincott Williams & Wilkins.


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BPA-211 (P) Introduction to Pharmacology

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

Note:

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

List of experiments:

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

Text Book:

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

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

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

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

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

ORGANIC CHEMISTRY

Unit-I

a.) Structure and Properties

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

b.)Aliphatic Compounds

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


Unit-II

a.) Isomerisim

Isomerism and nomenclature and associated physicochemical properties, optical activity.

b.)Reaction Mechanisms

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


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INORGANIC CHEMISTRY

Unit-III

a.) Introduction of Periodic Table

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

b.) Pharmaceutical Agents

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

Unit-IV

a.) Quantitative and Qualitative study

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

b.) Titrametric analysis

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

Text Books:

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

Reference Books:

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

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BPA-212 P PHARMACEUTICAL CHEMISTRY- ORGANIC AND INORGANIC CHEMISTRY

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

Note:

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

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 Semimicro Qualitative Inorganic Analysis. Hyderabad:


Reference Books:

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

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

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विद्यया धनं विद्याया धनं



BPA-203 PHARMACOGNOSY-I

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

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

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

Unit -I**Introduction to Pharmacognosy and Plant microscopy**

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

Unit -II

Introduction to plant metabolites

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

Unit -III**Sources of drugs**

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

Thallophytes:

(a) Algae-Diatoms, Agar and Alginic

Acid. (b) Fungi-Ergot, Yeast and

Mushrooms. *Pteridophytes* : Male fern

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Unit -IV

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

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

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: *Pharmacognosy* 36th edn. Nirali Prakashan, Pune, India.
3. S.S Handa Textbook 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.

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

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D		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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

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

Unit I

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

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

Dosage forms: Introduction to dosage forms, classification and definitions

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

Unit II

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

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

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

Unit III

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

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Unit IV

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

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

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

1. L. Lachman, H.A. Lieberman and J.L. Kanig, The Theory and Practice of Industrial Pharmacy, Lea andFebiger, 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, PitmanBooks Ltd., London, U.K.

4. M.E. Aulton, Pharmaceutics, The Science& Dosage Form Design, Churchill Livingstone,Edinburgh.

5. H.C. Ansel et al., Pharmaceutical Dosage Form and Drug Delivery System, LippincottWilliams andWalkins, New Delhi.


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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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

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

Unit I

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

Unit-II**Brief description of technical terminologies (Paribhasa prakarana)**

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

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

Unit-III**Brief description of yantra and their application**

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

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Unit-IV

Brief description and application of Musha (crucible) and Kosthi

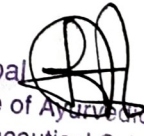
Samanya Musa, Gostanimusa, Vajramusa, Maha musa, Yoga musa, Vrintak musa, Malla/pakwa musa, different types of crucibles. Satvapataana kosthi, Chullika, Patala kosthi, Gara kosthi, Angara kosthi and knowledge of various heating appliances viz. Gas stove, Hot plate and heating mantle.

Text Books:

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

Reference Books:

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


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BPA-213(P) RASA SHASTRA-I

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

Note:

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

List of experiments:


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

Text Books:

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


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BPA 206 AYURVEDA PARICHAY INCLUDING ROGA NIDAN EVAM CHIKITSA

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

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

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

Unit I

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

Unit II

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

Unit III

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

Unit IV

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

Reference Books:

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

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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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

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

UNIT I

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

UNIT II

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

UNIT III

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

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

UNIT IV


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

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.


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ATL MEDICAL & RESEARCH

SEMESTER-III

संस्कृत चिकित्सा विभाग, अमरु

विद्यया विवर्धते, विनायक प्रसाद



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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

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

Unit-I

Basis of nomenclature of dravya, Basis and Derivation of synonyms. Ecology- Classification of geographical area (desha) and soil (bhumhi), 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 to virya, preservation of collected dravyas, Storehouse (bheshajagara).

Unit-II

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

Unit-III

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

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Ahiphena 2. Agnimantha 3. Agar 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. Bijapoor 27. Bola 28. Chandrashura 29. Changeri 30. Vrukshamla

Text Books

1. Dravyaguna vigyana by Dr. Mansi Deshpandey, Chaukhamba Sanskrit Pratishthana, 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.

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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	25	25	50	3 hrs

Note:

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

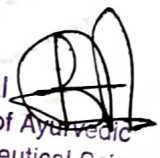
1. To carry out survey in nearby places and identify and collect the rare medicinal plants (not less than 10)
2. Genuineness test of following substances: Gaudugdha, ghrita, hingu, madhu and guda.
3. Knowledge of market sample and price of dravya.

Text Books-

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


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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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

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

Unit I

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

Unit-II

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

Unit III**A) Drugs containing Plant metabolites**

Study of Biological source, Chemical constituents and uses of

Carbohydrates- Starch – Maize, Amrita Satwa, Honey. Gums – Babul niryas, Shalmali niryas.

Mucilages – 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

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Amalaki.

Unit IV

Study of Biological source, Chemical constituents and uses of Glycosides

- a) Anthraquinone glycosides- Svarnapatri, Kumari, Manjishta, Aragvadha, Chakramarda.
b) Cardiac – Karavira, Arka, Vanapalandu, Digitalis. c) Saponins – Brahmi, Mandukparni, Laghugokshura, Arishtaka, Kantakari, Shatavari. d) Flavonoids – Yashtimadhu, Bhallataka, Karanja, Kalmegh, Palash. e) Coumarins – 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: *Pharmacognosy* 36th edn. Nirali Prakashan, Pune, India.

Reference Books:

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

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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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks. Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

Unit-I

Introduction to following topics

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

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

Unit-II

Surface and Interfacial Phenomenon

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

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

Unit-III

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

Unit-IV

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


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

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

Reference Books:

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


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

Note:

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

List of experiments:

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

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

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

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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.

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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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks. Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

Unit I

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

Unit II

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

Unit III

Murchhana and Jarana of Parada, Preparation & examination of Kajjali, types of ras ausadhis, knowledge of khalviya rasayana e.g. Tribhuvana kirithi 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, Standardization & GMP's of Rasa aushadhis.

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Text Books:

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

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

Note:

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

List of experiments:

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

Text Books:

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

Reference Books:

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

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

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BPA-305 PHARMACOLOGY-I

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

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

Unit II

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

Unit III

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

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

Unit IV

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

Text Books:

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

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3. A book of Clinical Pharmacology- R Kumar.

Reference Books:

1. Rang MP, Dale MM, Ritter 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. Lippincott's Illustrated Reviews -Pharmacology. Philadelphia: Lippincott Williams & Wilkins

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BPA-314 P PHARMACOLOGY-I

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

Note:

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

List of experiments:

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

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

Text Books:

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

Reference Books:

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

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4. Ayurved Sara Sangraha.


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

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BPA-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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

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

Unit -I

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

Unit -II

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

Unit -III

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

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

Unit -IV

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

Text Books:

1. A.C. Guyton & J.E. Hall, Text book of Medical Physiology published in India by Prism 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

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BPA-315P 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	25	25	50	3 hrs

Note:

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

List of experiments:

1. Urine Analysis.
2. Measurement 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

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SEMESTER- IV

BPA-401 PHARMACEUTICAL ANALYSIS OF AYURVEDIC DRUGS-I

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

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

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

Unit I

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

Unit II

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

Unit III

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

Unit IV

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


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Text Books:

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

Reference Books:

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


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BPA-411 P PHARMACEUTICAL ANALYSIS OF AYURVEDIC DRUGS-I

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

Note:

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

List of experiments:

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

Text Books:

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

Reference Books:

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

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BPA-402 PHARMACOLOGY

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessiona I	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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

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

Unit I

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

Unit II

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

Unit III

Sexually transmitted diseases: AIDS, Syphilis, Gonorrhea

Unit IV

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

Text Books:


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

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Reference Books

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

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विश्वविद्यालय, हिमाचल प्रदेश



BPA-403 PHARMACOGNOSY OF AYURVEDIC DRUGS-II

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

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

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

Unit I

Study of biological source, chemical constituents and uses of secondary metabolites

a) Alkaloids 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, Ardaka, Haridra, Trivrit, Vijaya, Indravaruni, Vidanga, Kampillaka, Nagakesara, Guggulu, Shallaki, Sarala, Sarjarsa 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

Concept 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 (Micrometry) of elements like Trichomes,

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Crystals, Xylem vessel, Fiber etc.

Text Books:

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


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BPA-412 P PHARMACOGNOSY OF AYURVEDIC DRUGS-II

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

Note:

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

List of experiments

1. To draw a square of 1 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: *Pharmacognosy* 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.

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

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BPA-404 PHARMACEUTICS - PRINCIPLES OF PHARMACEUTICAL OPERATIONS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessiona I	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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

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

Unit-I**a) Introduction**

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

b) Mixing of Solids:

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

Unit-II**a) Filtration**

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

b) Centrifugation

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

Unit-III**a) Evaporation**

Application, evaporation process, factors affecting evaporation, classification of evaporators. Theory of evaporation, heat transfer coefficient, material and energy balance.

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

Unit-IV

a) Heat transfer

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


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

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

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

Reference Books:

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


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BPA-405 RAS SHASTRA - III

Teaching Scheme			Credits C	Marks			Duration of End Semester Examination
L	T	P/D		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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

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

Unit I**a) Maharasa**

Identification, synonyms, occurrence, 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, Gairaiaka, 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, Mrddarasnga, Agnijara, Giri Sindura and Hingula.

Unit III**Dhatu**

Identification, synonyms, occurrence, properties, grahya-agrahya lakshna, samanya-vishesh shodhana, marana, dose, therapeutic uses and phamacopoieal standards of bhasma of following:

Suddha Loha: Swarna, Rajata, Tamra, Loha, Mandura, **Putiloha:** Naga, Vanga, Yashada, **Mishra Loha:** Kamsya, Pittala, Varta Loha.

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Unit IV

Ausadhi Yoga Gyanam

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

Text Books:

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

Reference Books:

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

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

Note:

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

List of experiments:

1. To study 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, Chakambha Orientalia, Varanasi

Reference Books:

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

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4. Ayurved Sara Sangraha.

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

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BPA-406 DRAVYA GUNA VIGYAN – III

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

Note: The question paper shall consist of four units as per the syllabus. The paper setter will be set two questions from each Section/unit. However students may 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. Mukta
7. Pravala
8. Shankha
9. Shukti
10. Shambuka
11. Varatika
12. Indragopa

Introduction, knowledge of guna-karma of following groups of Annapanavarga:-

1. JalaVarga
2. DugdhaVarga
3. MadhuVarga
4. 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, 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. Hingu
2. Jambu
3. Jatamansi
4. Jatiphala
5. Jeerakadvaya
6. Jyotishmati
7. Kalamegha
8. Kampillaka
9. Kanchanara
10. Kantakari
11. Kapikacchu
12. Karkatakshringi
13. Karpura
14. Katuki
15. Khadira

Unit-III

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

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i.e. Habit and habitat/varieties, External morphology, Useful parts, Important phytoconstituents. 1. Kiratiktika 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, 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, Amayikaprayeroga and Matra (Therapeutic administration and Dose), Name of important formulations, Adverse effects, remedial measures 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 Pratishthana, New Delhi.
2. Dravyaguna vijana Vol 1-5 by Prof. Sharma P.V; published by Chaukhambha Bharti Academy, Varanasi.

Reference Books

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

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BPA-414P DRAVYA GUNA VIGYAN – III

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

Note:

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


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

Text Books-

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

Reference Books:


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


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BPA-515: INDUSTRIAL TRAINING

L	T	P	Credits, assigned	
-	-	-	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.


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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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks. Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

Unit I

a) *Study of cultivation, collection, substitutes, adulterants, diagnostic macroscopic and microscopic features and phytochemical tests for identity of drugs* – Glycyrrhiza, Digitalis, Aloe, Senna and Datura.

b) *Study of botanical sources including alternative names, chemical constituents and therapeutic uses of the following indigenous traditional Drugs:* Amla, Behera, Harad, Ashwagandha, Babchi, Brahmi, Vasaka, Bach, Tulsi, Shatavar, Shankhpushpi, Kutaki, Kalmegh, Gokhru, Chirata, Ashoka, Jatamansi, Kuth and Gilo.

Unit II

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

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

f. *Alkaloidal amine group:* Ephedra and 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

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


Unit IV: Concept of heavy metal toxicity in Ayurvedic drugs and methods for measuring the toxicity, plant adaptogens (history, definition and examples), Anticancer plants with examples. Some traditional recipes/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 Handa Textbook of Pharmacognosy Vallabh Publications, New Delhi.

Reference Books:

1. Evans WC (3002): *Trease and Evan's Pharmacognosy*. 15th edn., Saunders' 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.



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BPA-502 PHARMACEUTICAL ANALYSIS OF AYURVEDIC DRUGS – II

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

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

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

Unit I

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 preparation by different technique and detector used in I.R. Spectrophotometry and qualitative and quantitative applications in the field of the Ayurvedic Pharmacy.

Unit III

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

Unit IV

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

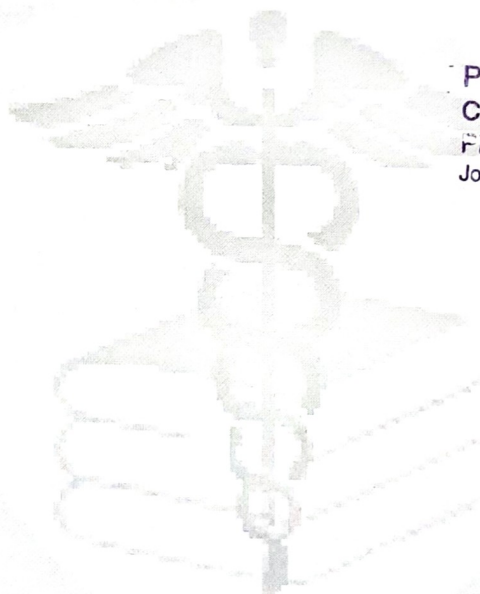

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Text Books:

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

Reference Books:

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




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

Note:

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

1. To find out R_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 drugs UV.
10. To find out optical rotation of single or compound Ayurvedic drugs sample.

Text Books:

1. Kemp W. Organic Spectroscopy: 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.

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BPA-503 PHARMACEUTICAL TECHNOLOGY FOR AYURVEDIC DRUGS-I

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

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

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

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

Unit-I

a.) Ophthalmic preparations:

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

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

Unit-II

a.) Cream: Introduction, Application, Classification, techniques used for formulation of pharmaceutical cream, evaluation of cream.

b.) Preservatives: Preservatives (Antioxidants and antimicrobial agents) used in pharmaceutical preparation with their concentration.

Unit-III

a.) Tablet:

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

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

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Unit-IV

Capsules:-Hard gelatin, Soft gelatin

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

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

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

Reference Books:

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

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BPA-512P PHARMACEUTICAL TECHNOLOGY FOR AYURVEDIC DRUGS-I

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

Note:

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

List of experiments:

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

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

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

Reference Books:

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

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BPA-504 DRAVYAGUNA VIGYANA – IV

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 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

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

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

Unit-II

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

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

Unit-III

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

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described in Charak, Sushrut and Bhavaprakasha i.e. Habit and habitat/varieties, External morphology, Useful parts, Important phytoconstituents, Rasa panchaka, Action on Dosha, Dhatu, Mala, Therapeutic indications, Amayikaprayoga and Matra (Therapeutic administration and Dose), Name of important formulations, Adverse effects, remedial measures and Shodhana (as required) 1. Rasona 2. Saireyaka 3. Shallaki 4. Saptaparna 5. Sarpagandha 6. Sariva 7. Shalaparni 8. Shalmali 9. Shankhapushpi 10. Shatavari 11. Shathapushpa 12. Shigru 13. Shirisha 14. Shyonaka 15. Thalispaptra 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. Kumuda 4. Kusha 5. Lajjalu 6. Langali 7. Latakaranja
8. Latakasturi 9. Madayantika 10. Mahanimba 11. Mandukaparni 12. Mashaparni
13. Mayaphala 14. Methika 15. Meshashruni 16. Mudgaparni 17. Mulaka 18. Nagabala 19. Nala 20. Narikela

Text Books

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

Reference Books:

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

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BPA-513 P DRAVYAGUNA VIGYANA – IV

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

Note:

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

1. 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 BhartiAcademy,Varanasi.

Reference Books:

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

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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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

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

Unit I

a) Ratna

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

b) Uparatna

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

Unit II

a) Sudha varga

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

b) Sikta varga

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

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Unit III

a) Ksara Varga

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

b) Visha and Upavisha

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

Unit IV

a) Brief Knowledge of standardisation of Rasausadhis.

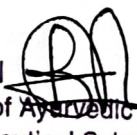
b) Concept of Pharmacovigilance and its status in India with reference to Ayurvedic drugs.

Text Books:

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

Reference Books:

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


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BPA-514 P RASSHAstra -IV

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

Note:

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

List of experiments:

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

Text Books:

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

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Reference Books:

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

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हिमाचल प्रदेश, भारत

SEMESTER- VI

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

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

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

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

Unit I

Size reduction

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

Size separation

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

Unit II

Drying

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

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

Unit III

Distillation

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

Unit-IV

Crystallization:

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

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Agitated batch crystallizer, Swenson walker crystallizer, vacuum crystallizer.

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

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

Reference Books:

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



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BPA-602 PHARMACOLOGY & TOXICOLOGY OF AYURVEDIC DRUGS-1

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D		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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

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

Unit I

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

Unit II


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

Unit III

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

Unit IV

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



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Text Books:

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

Reference Books:

1. Rang MP, Dale MM, Ritter 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. Lippincott's Illustrated Reviews - Pharmacology. Philadelphia: Lippincott Williams & Wilkins




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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

Manaparibhas

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

Unit II

Dravya sangrahaana

Collection of drugs, jangama dravya sangrahaana, prayojyangas, agraahya dravyas, methods of adulteration, aushdha kalpana pariksanavidhi.

Unit- III

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

Unit IV

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a) Definitions of Ayurvedic, Siddha and Unani drugs, drug, patent or proprietary medicine, standard quality, misbranded drugs, adulterated drugs, spurious drugs, misbranded cosmetics, spurious cosmetics, adulterated cosmetics as mentioned in the Drugs and Cosmetics Act and Rules.

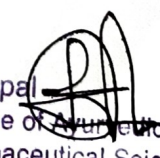
b) Provisions applicable to manufacture of Ayurvedic, Siddha and Unani Drugs, technical staff, Drugs Technical Advisory Board, Ayurvedic, Siddha and Unani Drugs Consultative Committee, Labelling, packing and limit of alcohol in Ayurvedic and Unani Drugs.

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.


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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	25	25	50	3 hrs

Note:

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

List of experiments:

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

Text Books:

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

Reference Books:

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

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BPA-604 PHARMACEUTICAL MICROBIOLOGY

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D		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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

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

Unit I

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

Unit II

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

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

Unit III

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

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

Unit -IV

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

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Text Books:

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


Reference Books:

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

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जोगिन्दर नगर, मण्डी (हि.प्र.)

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BPA-612 P PHARMACEUTICAL MICROBIOLOGY

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

Note:

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

List of experiments:

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

Text Books:

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

Reference Books:

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

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BPA-605 PHARMACOGNOSY –III

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

Unit II

- 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.
- Phytochemical Screening: Preparation of extracts and Screening of alkaloids, saponins, cardiac glycosides, flavonoids, tannins and polyphenols, anthraquinones, amino acids in plant extracts

Unit III

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

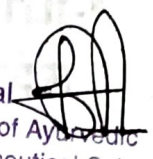
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Unit IV

- a) Study and applications of TLC, paper chromatography, column chromatography, Gas, HPLC, centrifugal partition chromatography.
- b) Quality control of crude drugs: Adulteration of crude 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 Handa Textbook of Pharmacognosy Vallabh Publications, New Delhi.
3. A book of Clinical Pharmacology- R Kumar.


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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	25	25	50	3 hrs

Note:

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

List of experiments

1. To carry out extractive value of some drugs listed in API
2. To carry out Refractive index of some Ayurvedic drugs listed in API.
3. To prepare TLC plates by various methods.
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 drugs listed in API.
12. To carry out isolation of volatile oil and carry out solubility test, refractive index, TLC profile of the oil obtained camphor, eucalyptus oil.
13. To study different labels pertaining to Ayurvedic and Modern dosage forms.

Text Books:

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


Reference Books:

1. Evans WC (3002): *Trease and Evan's Pharmacognosy*. 15th edn., Saunderson Elsevier Pvt Ltd. New Delhi-24, India.

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

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BPA-606 PHARMACOLOGY –II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D		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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

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

Unit I

Coagulants (Alum, Chitosan) and anticoagulants (heparin, warfarin, aspirin), Antiplatelet (clopidogrel, dipyridamole, aspirin) and fibrinolytic drugs (streptokinase and urokinase), haematinics (iron, Vit. B₁₂ folic acid, Vit. C)


Unit II

Pharmacology of Endocrine System:

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

Unit III

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


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Unit IV


Chemotherapy of Microbial Diseases: General principle of chemotherapy, Sulphonamides, quinolones, penicillins, 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. A book of Clinical Pharmacology- R Kumar.

Reference Books:

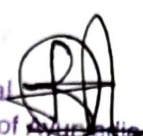
1. Rang MP, Dale MM, Ritter JM. Pharmacology. New York: Churchill Livingstone.
2. Brunton LL, Lazo JS, Parker KL. Goodman and Gilman's The Pharmacological Basis of Therapeutics. New York: McGraw Hill.
3. Mycek MJ, Harvey RA, Champe PC. Lippincott's Illustrated Reviews - Pharmacology. Philadelphia: Lippincott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


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BPA-715: HOSPITAL TRAINING

L	T	P	Credits, assigned	
-	-	-	2	

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


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SEMESTER- VII

BPA-701 PHARMACY ACT RULES & REGULATIONS & PHARMACEUTICAL MANAGEMENT

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

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

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

Unit-I

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

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

Unit-II

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

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

Pharmaceutical Management:-

Unit-III

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

Unit-IV

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

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


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

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

Reference Books:

1. Kotler P, Armstrong. Principles of Marketing. New Delhi: PHI Learning Pvt Ltd
2. Wadedhra BL. Law Relating to Patents, Trademarks, Copyright Design and Geographical Indications. New Delhi: Universal Law Publishing.
3. Bansal P. IPR Handbook for Pharma Students and Researchers. Hyderabad: Pharma Book Syndicate.


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BPA-702 PHARMACEUTICAL TECHNOLOGY FOR AYURVEDIC DRUGS- II

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, techniques for preparing sustained release formulations, evaluation of sustained release tablets.

Unit-II

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

Unit-III

a.) Microsphere

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

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

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Unit-IV

a.)Standardization of Herbal drugs:

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

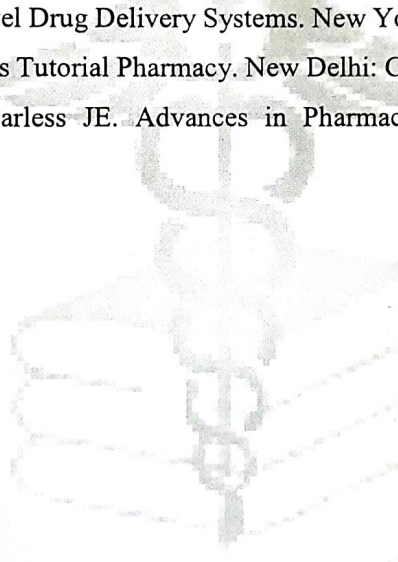
b.)**Quality control test of Herbal drugs:-**In process quality control test for Ayurvedic tablet, Ayurvedic capsule, injectables and liquid orals (monophasic and biphasic).

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

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



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BPA- 711P PHARMACEUTICAL TECHNOLOGY FOR AYURVEDIC DRUGS- II

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

Note:

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

Following is suggested a list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester.

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.

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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 (Symptoms, Classification, root causes, treatment and cure).

Unit II

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

Unit III

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

Unit IV

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

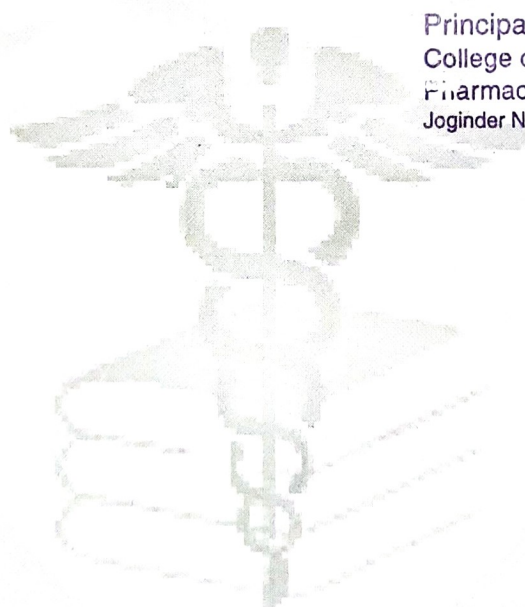
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Text Books:

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

Reference Books:

1. Rang MP, Dale MM, Ritter 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. Lippincott's Illustrated Reviews - Pharmacology. Philadelphia: Lippincott Williams & Wilkins




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BPA-704 PHARMACEUTICAL ANALYSIS OF AYURVEDIC DRUGS-III

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

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

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

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

Unit I

Introduction of Spectroscopy

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

Ultraviolet and visible spectrophotometry :


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

Unit II

Flame Photometry :

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

Unit III


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a) Infrared spectrophotometry :

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

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

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 Spectroscopy: London: ELBS / WH Freeman & Co.


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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	25	25	50	3 hrs

Note:

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

List of experiments:

1. To carry out TLC of different single or compound drugs/formulations.
2. To carry out paper chromatography of different single or compound drugs/formulations.
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 Spectroscopy: London: ELBS / WH Freeman & Co.

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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, chakra, kanjika, sandaki, modern aspect of alcoholic formulations.

Unit IV

Standardization protocols

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

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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, ChakhambhaOrientalia, Varanasi.

Reference Books:

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

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BPA-713 P BHAISHAJYA KALPNA -III

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

Note:

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

List of experiments:

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

Text Books:

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

Reference Books:

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

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BPA-706-I YOGA

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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

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

Unit I

Astanga yoga:

Yama, Niyama Asana and its importance Standing Postures Ardhakatichakrasana, Padahasthasana, Ardhashakrasana, Trikonasana. Sitting postures Swasthika, Gomukhasana, Padmasana, Vajrasana, Bhadrhasana, Shashankasana, Ushtrasana, Pashchimottanasana, Suptavajrasana, ardhmatsyendrasana, Siddhasana.

Unit II

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

Suryanamaskara – procedure and benefits, Surya kriya

Unit III

Pranayama

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

Unit IV

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

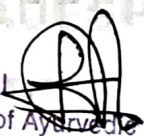
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Text Books:

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

Reference Books:

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

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BPA-714-I P YOGA

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

Note:

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

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BPA-706-II AFI

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

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

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

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

Theory

Unit I

Introduction of AFI and its importance.

Unit II

Study of different dosage forms described in AFI.

Unit III

Doses of different dosage forms described under AFI.

Unit IV

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

Text Books:

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

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BPA-714-II P AFI

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


Note:

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

Preparation of different formulations mentioned in AFI.

Text Books:

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


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BPA-706-III AYURVEDIC COSMETICS

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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

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

Theory

Unit I

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

Unit II

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

Unit III

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

Unit IV

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

Text Books:

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

Reference Books:

1. Database on medicinal plants CCRAS.

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BPA-714-III P AYURVEDIC COSMETICS

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

Note:

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


1. To 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.


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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 be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

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

Unit I

Drug Metabolism

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

a) Phase –I

Oxidative reactions and Reductive Reactions with complete study of cytochrome P-450 and Flavin monooxygenases 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, Nomenclature, classification, antimicrobial spectrum, and uses. The emphasis would be only on B.P. and I.P. compounds.

a) General considerations with Sulphonamides and other synthetic antimicrobial agent's.

b) Disinfectants and antiseptics.

Unit III

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

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

b) Cephalosporins

Unit IV

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

a) Antineoplastic agent .


b) Antiviral agents

Text Books:

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


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BPA-814P MEDICINAL CHEMISTRY

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

Note:

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

List of experiments

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

Text Books:

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

Reference Books:

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

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5. Remington's Pharmaceutical Sciences.
6. Martindale's extra pharmacopoeia.
7. Organic Chemistry by I.L. Finar, Vol. II.
8. The Organic Chemistry of Drug Synthesis by Lednicher, Vol. 1-5.
9. Indian Pharmacopoeia.
10. Text book of practical organic chemistry- A.I. Vogel.

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BPA-802 PHARMACEUTICAL ANALYSIS

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

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

Unit I

a) Nuclear Magnetic Resonance Spectroscopy

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

b) Mass Spectrometry

Instrumentation, Basic principle determination of the molecular formula, recognition of the molecular ion 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 Nephelometry with their Instrumentation and Applications.

Unit III

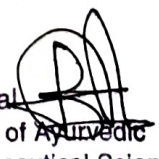
a) Affinity Chromatography

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

b) Special Chromatography

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

Unit IV


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a) X-Ray

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

B) Radio Immuno Assay (RIA)

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

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 Spectroscopy: London: ELBS / WH Freeman & Co.

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BPA-811P PHARMACEUTICAL ANALYSIS

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

Note:

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

List of experiments

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

Text Books:

3. L.G. Chatten, Pharmaceutical Chemistry, Vol.-1 and 2, Marcel Dekker, NY (Latest Edition).
4. A.H. Beckett and J.B. Stenlake, Practical Pharmaceutical Chemistry, Vol.1 and 2, Athlone 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 CO., London, 1974.

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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 kalpana**

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

Unit II**Bahya kalpana**

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

Unit III**a) Netra kalpana**

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

b) Mukha kalpana

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 aauthors, 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 Bhaishajya Kalpana Vigyana by Dr. Santosh Kumar Mishra, ChakhambhaOrientalia, Varanasi.

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Reference Books:

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

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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	25	25	50	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 Anuvrasna 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.

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BPA-804 PHARMACEUTICS- PHARMACOKINETICS AND BIOPHARMACEUTICS

Teaching Scheme			Credits C	Marks			Duration of End Semester Examination
L	T	P/D		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, 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, partition coefficient, classification of pharmacokinetics models.

b.) **Non Linear Pharmacokinetics:** Causes of non-linearity, Michaelis-Menten equation, determination of V_{max} and T_{max} .

Unit-III

Biopharmaceutics: Bioavailability and Bioequivalence:

Bioavailability: Objective, consideration and measurement of bioavailability by both methods pharmacokinetics and pharmacodynamic methods, Biopharmaceutics drugs

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classification System, Method of enhancement of bioavailability, Bioequivalence: Objective, Application of Bioequivalence Studies, general principles of bioequivalence, Criteria for bio equivalence requirement.

Unit-IV

- a.) **Drug Excretion:** Concept of clearance, mechanism of renal clearance, clearance ratio, hepatic clearance.
- b.) **Dissolution:** -Concept of dissolution, Theories of dissolution, in-vitro drug dissolution testing models, in vitro sink condition and its role and In vitro-in vivo correlation.

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

1. Brahmkar DM, Jaiswal SB. Biopharmaceutics and Pharmacokinetics – A Treatise. New Delhi: Vallabh 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. Singapore: McGraw Hill.

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BPA-805 CLINICAL PHARMACY

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

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

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

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

Unit I

Clinical Pharmacokinetics

a) Clinical laboratory tests for Liver function and Kidney function. Drug Interactions Factors- Drug determinants, Host determinants, Multiple drug therapy, Methods of investigating drug interactions, Clinical investigation of specific drug interactions, Pharmacokinetic aspects of drug interaction- Drug elimination, distribution and absorption

Prevention of drug interactions in general practice.

b) Drugs used in pregnancy, pediatrics and geriatrics. Management of cardiovascular disorders, CNS disorders, Gastro-intestinal diseases and respiratory diseases.

Unit II

Drug information services, documentation and counseling of patients

Ambulatory patient care: Pharmacist's responsibility, proper use of medication, patient counselling, drug utilization review, medication profiles, non-prescription drug usage, health education, new and expanded dimensions, health care delivery systems.

Patient compliance-Non compliance, factors associated with non compliance, improving compliance.

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Unit III

Procurement and distribution of drugs in an Institution (Hospital Pharmacy)

Hospital - Definition of hospital pharmacy, organization, and facilities provided- pharmacist's responsibility - technical responsibilities (procurement, storage, dispensing, control, stock and inventory control, manufacturing sterile products, investigational drugs, I.V. admixtures, radiopharmaceuticals, assay and quality control), administrative and academic responsibilities.

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, 1989.
2. N.Thakur Lecture on Clinical Pharmacy, P.Prakashan, India.
3. A book of Clinical Pharmacology- R Kumar.

Reference Books:


1. Remington, The Science and Practice of Pharmacy, 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.

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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 formulation by observing API norms and they will also perform Quality Control tests and make a conclusion of Drug/Formulation.


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Mail & Redg.



RAJIV GANDHI GOVT. P.G. AYURVEDIC COLLEGE & HOSPITAL
PAPROLA, KANGRA (HIMACHAL PRADESH) - 176115
Email: principal.gacpaprola@gmail.com Website: www.paprolaayurved.org



No: AYR/PGC/UG B.PHARMA/22/2024:~1037

Dated: 16/2/24

To

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

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

Sir,

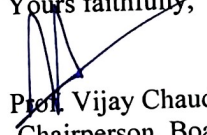
Kindly refer to your letter No. AMRU/COE/EVEL/B.PHARMA/AYUR/2023/98 dated 18-01-2024 on the subject captioned above.

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

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

Encl.: (As above.)

Yours faithfully,


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

Minutes of Meeting

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

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







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

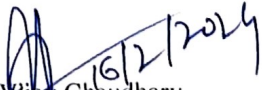
Decision taken: After having a detailed discussion it was decided that B. Pharmacy(Ayurveda) Regulation, syllabus and Scheme of Examination alongwith Absolute grading point System may be incorporated in Ordinance of Atal Medical & Research University , Himachal Pradesh Ner Chowk, Mandi Volume -I .

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

The meeting ended with thanks from the Chair.

Following members attended the meeting physically/virtually:

1. Principal , College of Ayurvedic Pharmaceutical Sciences Joginder Nagar Distt. Mandi(HP) 
2. Principal, Men-isee-Khang Sowa-Rigpa College, Dharamshala(HP). 
3. Principal, Solan Homeopathic Medical College & hospital Kumarhatti, Distt. Solan(HP) 
4. Prof. Rajesh sood, Professor & HOD Ayurveda samhita Evum Siddhant Deptt. RGG PG Ayurvedic College & Hospital Paprola Distt Kangra(HP) 
5. Prof. Rajesh Manglesh, Professor & HOD Rog Nidan Deptt. RGG PG Ayurvedic College & Hospital Paprola Distt Kangra(HP). 
6. Dr. Ashish Mehta (outside expert) Prof. & HOD Panchkarma, Shri Krishna Govt. Ayurvedic College, Kurukshetra, Haryana. 


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