ACADEMIC BOOK 2018-19
II Semester

Better Science, Better Health.

PRAVARA RURAL EDUCATION SOCIETY's

COLLEGE OF PHARMACY (FOR WOMEN), CHINCHOLI,

Tal: Sinnar, Dist: Nashik

College Code PH - 5201

Approved by A.I.C.T.E., New Delhi,

Affiliated to Savitribai Phule Pune University, Pune

Permitted by Pharmacy Council of India, New Delhi

Recognized by Govt. of Maharashtra

Vision

To emerge as the most preferred pharmacy educational institute with global recognition and developing competent and socially sensitive pharmacists committed to healthcare needs of society.

Mission

To develop students as global citizen with conscience,
commitment and dedication.

To create world class facilities and ambience for advanced level of
teaching, research and practical training.

To recruit and retain highly motivated and qualified faculty to promote the cause of teaching and learning.

PHARMACIST'S OATH

I swear by the code of ethics of Pharmacy Council of India, in relation to the community and shall act as an integral part of health care team.

I shall uphold the laws and standards governing my profession.

I shall strive to perfect and enlarge my knowledge to contribute to the advancement of pharmacy and public health.

I shall follow the system which I consider best for Pharmaceutical care and counseling of patients.

I shall endeavor to discover and manufacture drugs of quality to alleviate sufferings of humanity.

I shall hold in confidence the knowledge gained about the patients in connection with my professional practice and never divulge unless compelled to do so by the law.

I shall associate with organizations having their objectives for betterment of the profession of Pharmacy and make contribution to carry out the work of those organizations.

While I continue to keep this oath unviolated, may it be granted to me to enjoy life and the practice of pharmacy respected by all, at all times!

Should I trespass and violate this oath, may the reverse be my lot!

INDEX

ACADEMIC CALENDAR
(June 2018-May 2019)

Week No.	Month	Week Days						No. of Working Days	Events	Responsible Dept./Staff/Faculty
		Mon	Tue	Wed	Thu	Fri	Sat			
1				13	14	15	16	3	13th-Reopening of III, V, VII Sem, M.Pharm III Sem 16th Ramzan ID	Academic dean Dr. C.J.Bhangale
2	**Jun2018**	18	19	20	21	22	23	6	21st-Yoga day 22nd- Guest lect.for VII Sem and M.Pharm III Sem 23rd-Alumni meet 27th . guest lecture for V Sem	Academic dean Dr. C.J.Bhangale
3		25	26	27	28	29	30	6	Regular lecture 30th - Teaching staff meeting	Academic dean Dr. C.J.Bhangale
4		2	3	4	5	6	7	5	Regular lecture III, V, VII Sem	Academic dean Dr. C.J. Bhangale
	July2018	9	10	11	12	13	14	6	3rd-Tree plantation 5th-Industrial visit for V Sem 6th –Guest Lect for M. Pharm 13th-GB and CDC meeting	Academic dean Dr. C.J. Bhangale
5		16	17	18	19	20	21	5	20th-Guest lecture for III Sem	Academic dean Dr. C.J. Bhangale
6		23	24	25	26	27	28	6	24th- Industrial visit for V Sem 17th-Parents meet V Sem 18th-Guest lect. for V Sem	Academic dean Dr. C.J. Bhangale
7		30	31					2	31st-Teaching staff meeting	Academic dean Dr. C.J. Bhangale
8	**Aug2018**			1	2	3	4	3	1st-Regular lecture of II,V,VII Sem, Reopening of I Sem, Parents meet of I Sem 3rd-Industrial visit for VII Sem	Academic dean Dr. C.J. Bhangale
9		6	7	8	9	10	11	4	10th-Freshers party Regular lecture of I,	Academic dean Dr. C.J. Bhangale

									II,V,VII Sem.	
10		13	14	15	16	17	18	6	15-Independence day 16th-Guest lecture for III Sem 17th-Pateti	Academic dean Dr. C.J. Bhangale
11		20	21	22	23	24	25	3	22nd Bakri ID 23rd-Industrial visit for M.Pharm 25th-Hon'ble Shri Vitthalrao vikhe pail Jayanti	Academic dean- Dr. C.J.Bhangale
12		27	28	29	30	31		6	28 th -Guest lecture of VII Sem 25th-Ganesh Chaturthi 29th-External viva of M.Pham IV sem 31st-Teaching staff meeting	Academic dean- Dr. C.J.Bhangale
13							1	1	1streopening of M.Pharm I Sem Regular lecture	Academic dean- Dr. C.J.Bhangale
14		3	4	5	6	7	8	6	1st-Hospital visit I Sem 5th-Teachers day	Academic dean- Dr. C.J.Bhangale
15		10	11	12	13	14	15	5	10th-14th -Sessional exam of III, V, VII Sem	Academic dean- Dr. C.J.Bhangale
16	**Sept 2018**	17	18	19	20	21	22	6	17th-Ganesh chaturthi 20th –Mohram 21st-Guest lecture of I Sem 22nd-National seminar	Academic dean- Dr. C.J.Bhangale
17		24	25	26	27	28	29	6	25th-World Pharmacist day 26th –HOD meeting 27th-Guest lecture-III Sem 28th -Industrial visit of I Sem	Academic dean- Dr. C.J.Bhangale
18		1	2	3	4	5	6	5	2nd –Mahatma Gandhi Jayanti 4th - Industrial visit of I Sem M. Pharm	Academic dean- Dr. C.J.Bhangale
19		8	9	10	11	12	13	6	8th-13th- Sessional exam of I, III, V	Exam incharge-Mr.V.A.Kashid
21	**Oct.2018**	15	16	17	18	19	20	3	18th-Vijayadashami	Academic dean Dr. C.J.Bhangale
22		22	23	24	25	26	27	6	27th-HOD meeting	Academic dean- Dr. C.J.Bhangale

23		29	30	31				2	29th-31st--Sem pract exam of VII Sem 31st-Teaching staff meeting	Academic dean Dr. C.J.Bhangale
24					1	2	3	3	Regular lecture	Academic dean- Dr. C.J.Bhangale
25		5	6	7	8	9	10	6	5th-10th- Diwali vacation	Exam Incharge- Mr.V.A.Kashid
26		12	13	14	15	16	17	5	Regular lecture of I, 12th-22nd III and V Sem final exam	Exam Incharge- Mr.V.A.Kashid
27	**Nov 2018**	19	20	21	22	23	24	6	19th-Regular lecture of Ist 19th-30th-Sem exam of VII Sem 20th- Ed-E-Milad 23rd-Gurunanak jayanti 24th-29th- Practical sem. Exam of III and V Sem 24th-30th- Sessional exam of I Sem	Exam Incharge- Mr.V.A.Kashid
28		26	27	28	29	30		4	24th-30th Sessional exam of I Sem 27th-HOD meeting 29th-Reopening of IV, VI sem. 29th-30th-M.Pharm Ist sem prac exam. 30th –Teaching staff meeting	Academic dean- Dr. C.J.Bhangale
29							1	0	1st-Eid-E-Milad	Academic dean- Dr. C.J.Bhangale
30	**Dec 2018**	3	4	5	6	7	8	6	4th-22nd-Semester I Sem Exam, M.Pharm I Sem final Exam 3rd to 8th –Project seminar of VII Sem 6th-M.Pharm. III Sem Seminar	Exam incharge Dr. C.J.Bhangale
31		10	11	12	13	14	15	5	10th-15th- NSS camp of VI Sem 11thReopening of VIII Sem	NSS Incharge-
32		17	18	19	20	21	22	6	Regular lecture of VII Sem	
33		24	25	26	27	28	29	5	24th-29th-- Practical sem. Exam of Ist sem 25th-X mas 30st- Hon'ble Shri	Exam Incharge- Ms.K.T.Vaditake

									balasaheb Vikhe patil death anniversary	
34		31							31st- Teaching staff meeting	
35			1	2	3	4	5	5	Regular lecture of IV, VI, VIII Sem	Academic dean- Dr. C.J.Bhangale
36	**Jan 2019**	7	8	9	10	11	12	6	7th- Reopening of II sem, M.Pharm IInd sem 8th – Guest lecture of VII Sem 10th-17th- IPA-NPW	Academic dean- Dr. C.J.Bhangale
37		14	15	16	17	18	19	5	17th- Guest lecture of VIII Sem 16th- Women empowerment seminar 19th –Guest lect. of M.Pharm II	Academic dean- Dr. C.J.Bhangale
38		20	22	23	24	25	26	6	26th- Republic day	Academic dean- Dr. C.J.Bhangale
39		28	29	30	31			4	31st -Staff Meeting	Academic dean- Dr. C.J.Bhangale
40						1	2	1	1st State level seminar	Academic dean - Dr. C.J.Bhangale
41		4	5	6	7	8	9	6	5th -Vidyarrthi arogyavardhini seminar 8th-Skill development (Student welfare Scheme) programme	Academic dean- Dr. C.J.Bhangale Student welfare coordinator- Mr. V.M. Gaware
42	**Feb2019**	11	12	13	14	15	16	5	11th Guest lecture of M.Pharm 13th-HOD meeting 14th- Industrial visit of II Sem	Academic dean- Dr. C.J.Bhangale TPC Incharge- Mrs V.P. Aher
43		18	19	20	21	22	23	5	19th-Shiv jayanti 18-22nd-Cultural days 23rd- Annual social gathering 23rd- State level seminar, 22nd -27th Sessional exam of II,IV,VI of B Pharm & II sem M. Pharm and regular lecture of VIII Sem of B. Pharm	Academic dean- Dr. C.J.Bhangale Cultural incharge- Mr.R.J.Bhor Exam Incharge- Mr.S.B.Somwanshi

44		25	26	27	28				22nd -27th Sessional exam of II,IV,VI of B Pharm & II sem M. Pharm and regular lecture of VIII Sem of B. Pharm 25th- GB and CDC Meeting 26th- Industrial visit of VIII sem 28th- Guest lecture of II Sem 28th-Teaching staff meeting	Exam Incharge- Mr.S.B.Somwanshi Academic dean- Dr. C.J.Bhangale TPC Incharge- Mrs V.P. Aher
45						1	2		1st- Women empowerment seminar Regular lecture 2nd HOD meeting	Academic dean- Dr. C.J.Bhangale
46		4	5	6	7	8	9		2nd- Industrial visit for VIII th sem 5th- Guest lecture of IV sem 4th- Mahashivratri 8th-Nirbhay kanya abhiyan seminar	TPC Incharge- Mrs V.P. Aher Academic dean- Dr. C.J.Bhangale
47	**March 2019**	11	12	13	14	15	16		11th-20th. Sessional exam of VIII Sem and regular lecture of II,IV,VI ,II sem M.Pharm 15th-Guest lecture of II sem	Exam Incharge- Mr.S.B.Somwanshi Academic dean- Dr. C.J.Bhangale
48		18	19	20	21	22	23		11th-20th. Sessional exam of VIII Sem and regular lecture of II,IV,VI , II Sem M.Pharm 21st-Holi	Exam Incharge- Mr.S.B.Somwanshi Academic dean- Dr. C.J.Bhangale
49		25	26	27	28	29	30		26th-Industrila visit of VI Sem 27th-Guest lecture for M. Pharm 28th-HOD meeting 29th- Guest lecture of VI Sem 30th-Industrial visit for M. Pharm 30th-Teaching staff meeting	Academic dean- Dr. C.J.Bhangale TPC Incharge- Mrs V.P. Aher
40		1	2	3	4	5	6	5	Regular lecture	Cultural Incharge

									5th- Farewell for final year students 6th- Gudipadwa	
41		8	9	10	11	12	13	6	8th-10th-Sem. Practical exam of VIII sem and regualr lecture of II, IV, VI, M.Pharm 14th- Dr. Babasaheb Ambedkar Jayanti	Exam Incharge- Dr. C.J.Bhangale
42	**April 2019**	15	16	17	18	19	20	5	15th -26th- Sem exam of VIII Sem, Regualr lecture of II, IV,VI, M. Pharm	Exam Incharge- Mr. V.A. Kashid
43		22	23	24	25	26	27	6	22nd-29th Sessional exam of II,IV,VI Sem, M. Pharm 27th- Death anniversary of Hon'ble Shri Vitthalrao Vikhe Patil	Exam Incharge- Mr.S.B.Somwanshi
44		29	30					2	30th-Teaching staff meeting	Academic dean- Dr. C.J.Bhangale
45				1	2	3	4	3	1st-Maharashtra din 1st-5th- Sem. Practical exam o f IV and VI Sem 5th- Hon'ble Shri Balasaheb vikhe patil Jayani	Exam Incharge- Mr.V.A.Kashid
46	**May 2019**	6	7	8	9	10	11	6	6th-10th- Sem. Practical exam of II Sem 11th- M.Pharm II Sem Practical exam	Exam Incharge- Mr.V.A.Kashid
47		13	14	15	16	17	18	5	15th- M. Pharm submission 16th- M. Pharm IV sem seminar 17th- M.Pharm IV sem thesis submission 16th-30th- Sem theory exam of II,IV,VI Sem, M.Pharm	Exam Incharge- MrV.A.Kashid
48		20	21	22	23	24	25	6	16th-30th- Sem theory exam of II,IV,VI Sem,M.Pharm	Exam Incharge- Mr.V.A.Kashid
49		27	28	29	30	31			31st- Teachiing staff meeting	Academic dean- Dr. C.J.Bhangale

Course of study
Course of study for semester II

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

***Non University Examination (NUE)**

Schemes for internal assessments and end semester examinations semester wise

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

***** The subject experts at college level shall conduct examinations

Academic Year 2018-19

First Year B. Pharmacy

Semester II

TIME TABLE 2018-2019 **W.E.F.01/01/2019**

TIME	BATCH	MON	TUE	WED	THU	FRI	SAT
IInd SEMESTER							
09.30-10.30		HAP/ SNB	Pathophysiology/ KBK	HAP/ SNB	OC-I/ VMD	Computer appli. / MTG	OC-I/ VMD
10.30-11.30		Biochem/ VMG	Biochem/ VMG	Pathophysiology/ KBK	Computer appli. / MTG	EVS/ KTV	Computer appli./ SGL
11.30-12.30		Pathophysiology/ KBK	HAP/ SNB	Biochem/ VMG	EVS/ KTV	OC-I/ RJB	EVS/ KTV
LUNCH BREAK							
1.15-4.15	**A**	HAP/ SNB	HAP/ SNB	Biochem/ VMG	OC-I/ VMD	Computer appli./ KTV	Computer appli. / SGL
	B	Biochem/ VMG	Biochem/ VMG	HAP/ SNB	Computer appli./ MTG	OC-I/ RJB	OC-I/ VMD
4.15-5.15		Remedial/ SNB	Remedial/ VMG	Tutorial/ KBK	Remedial/ MTG	Tutorial/ RJB	Remedial/ VMD

Teaching Staff:

1. **SNB: Mrs. Sangita N.Bhandare**
2. **VMG: Mr. Vinayak M.Gaware**
3. **KBK: Mr. Kiran B.Kotade**
4. **RJB: Mr. Rohit J.Bhor**
5. **SGL: Mr.Sandip G. Laware**
6. **KTV: Ms. Kaveri T.Vaditake**

Subject I

HUMAN ANATOMY AND PHYSIOLOGY-II

(HAP-II)

Scheme

Course of study

Course Code	Course Name	Lectures Assigned			
		Theory	Practical	Tutorial	Total
BP201T	HAP-II	03	-	01	04
BP207P	HAP-II	-	04	-	02

Schemes for internal assessments and end semester examinations

Course Code	Course Name	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams					
			Marks	Duration	Total	Marks	Duration	
BP201T	HAP-II	10	15	1 Hrs	25	75	3 Hrs	100
BP207P	HAP-II	5	10	4 Hrs	15	35	4 Hrs	50

BP201T. HUMAN ANATOMY AND PHYSIOLOGY-II

(Theory)

45 Hours

Scope:

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

Course Delivery:

The course will be delivered through lectures, class room interaction, and presentations.

Course Objectives:

Upon completion of this course the student should be able to

1. Explain the gross morphology, structure and functions of various organs of the human body.
2. Describe the various homeostatic mechanisms and their imbalances.
3. Identify the various tissues and organs of different systems of human body.
4. Perform the various experiments related to special senses and nervous system.
5. Appreciate coordinated working pattern of different organs of each system.
6. Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.

COURSE CONTENT	
Unit I	**10 hours**

Nervous system

Organization of nervous system, neuron, neuroglia, classification and properties of nerve fibre, electrophysiology, action potential, nerve impulse, receptors, synapse, neurotransmitters.

Central nervous system: Meninges, ventricles of brain and cerebrospinal fluid.structure and functions of brain (cerebrum, brain stem, cerebellum), spinal cord (gross structure, functions of afferent and efferent nerve tracts, reflex activity)

Unit II	**06 hours**

Digestive system

Anatomy of GI Tract with special reference to anatomy and functions of stomach, (Acid production in the stomach, regulation of acid production through parasympathetic nervous system, pepsin role in protein digestion) small intestine and large intestine, anatomy and functions of salivary glands, pancreas and liver, movements of GIT, digestion and absorption of nutrients and disorders of GIT.

Energetics

Formation and role of ATP, Creatinine Phosphate and BMR.

Unit III	**10 hours**

Respiratory system

Anatomy of respiratory system with special reference to anatomy of lungs, mechanism of respiration, regulation of respiration

Lung Volumes and capacities transport of respiratory gases, artificial respiration, and resuscitation methods.

Urinary system

Anatomy of urinary tract with special reference to anatomy of kidney and nephrons, functions of kidney and urinary tract, physiology of urine formation, micturition reflex and role of kidneys in acid base balance, role of RAS in kidney and disorders of kidney.

Unit IV	**10 hours**

Endocrine system

Classification of hormones, mechanism of hormone action, structure and functions of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas, pineal gland, thymus and their disorders.

Unit V	**07 hours**

Reproductive system

Anatomy of male and female reproductive system, Functions of male and female reproductive system, sex hormones, physiology of menstruation, fertilization, spermatogenesis, oogenesis, pregnancy and parturition

Introduction to genetics

Chromosomes, genes and DNA, protein synthesis, genetic pattern of inheritance

Recommended Books (Latest Editions)

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

Reference Books (Latest Editions)

1. Physiological basis of Medical Practice-Best and Tailor. Williams & Wilkins Co, Riverview, MI USA.
2. Text book of Medical Physiology- Arthur C, Guyton and John. E. Hall. Miamisburg, OH, U.S.A.
3. Human Physiology (vol 1 and 2) by Dr. C.C. Chatterrje, Academic Publishers Kolkata.

LESSON PLAN			
S. No	**Topic**	**No. of hours**	**Name of the faculty**
Unit I	**Nervous System**		Mrs. Sangita Bhandare
	Structure of neuron, Neuroglia	1	
	Classification and properties of nerve fibre, electrophysiology	1	
	Geneneration of action potential and propogation of Nerve impulse, receptors ,synapse, neurotransmitters	1	
	Central nervous system		
	Meninges of brain	1	
	Ventricles of brain and cerebrospinal fluid	1	
	Structure and function of various parts of brain	1	
	Functions of afferent and efferent nerve tracts	1	
	Structure and function of spinal cord,	1	
	Spinal nerves	1	
	Reflex arcs. Reflux activity	1	
Unit II	**Digestive system**		Mrs. Sangita Bhandare
	Anatomy of GI tract with special reference to anatomy and functions of stomach (Acid production in the stomach, regulation of acid production through parasympathetic nervous system, pepsin role in protein digestion.	1	
	Small intestine, Large intestine	1	
	Anatomy and function of salivary glands, Liver, Pancreas	1	
	Process of digestion and absorption of carbohydrates, proteins and fats	1	
	Process of defaecation, Disorders of digestive system	1	
	Energetics		
	Formation and role of ATP ,Creatinine Phosphate and BMR	1	
Unit III	**Respiratory system** Anatomy of respiratory system with reference to anatomy of lungs	1	Mrs. Sangita Bhandare
	mechanism of respiration	1	
	regulation of respiration	1	

	Lung Volumes and capacities transport of respiratory gases	1	
	Artificial respiration and resuscitation methods.	1	
	Central nervous system Meninges, ventricles of brain	1	
	Cerebrospinal fluid, structure of brain	1	
	Functions of brain (Cerebrum, brain tem, cerebellum)	1	
	Spinal cords – Gross structure	1	
	Functions of afferent and efferent nerve tracts, reflex activity	1	
Unit IV	**Endocrine system** Classification of hormones, mechanism of hormone action	1	Mrs. Sangita Bhandare
	structure and functions of anterior pituitary gland	1	
	structure and functions of posterior pituitary gland	1	
	structure and functions thyroid gland,	1	
	structure and functions parathyroid gland	1	
	structure and functions adrenal gland, mineralocorticoids,	1	
	structure and functions pancreas and their disorders		
	structure and functions pineal gland and their disorders	1	
	structure and functions thymus and their disorders	1	
Unit V	**Reproductive system:**		Mrs. Sangita Bhandare
	Anatomy of female reproductive system, Function of female reproductive system	1	
	Anatomy of male reproductive system, Function of male reproductive system	1	
	Sex hormones	1	
	Physiology of menstruation , fertilization,	1	
	Pregnancy and parturition	1	
	Process of oogenesis	1	
	Process of spermatogenesis	1	
	Introduction to genetics, Chromosomes, genes and DNA,	1	
	Protein synthesis, genetic pattern of inheritance	1	
TOTAL NUMBER OF HOURS		45	1

QUESTION BANK

Q.1) Answer the following **(Marks: 10)**

1. Explain the anatomy of spinal cord. Write in detail about reflex arc.
2. Define respiration. Describe the actions of muscles involved in breathing. Add a note on transport of gases.
3. Explain the physiological role of hormones of anterior pituitary gland.
4. Explain the location ,hormones and functions of posterior pituitary gland
5. Explain in detail various phases of Menstrual Cycle and harmones involved in it.
6. Draw and enlist the parts of brain. Describe in detail the anatomy and functional areas of cerebrum.
7. Define respiration. Explain in detail the mechanism of breathing and exchange of gases during respiration.
8. Explain in detail the major events in female reproductive cycle.
9. Explain the organization of nervous system. Write in detail anatomy and functions of brain stem.
10. Draw a neat labeled diagram of nephron and explain detailed physiology of urine formation.
11. Explain the anatomy and functions of Lungs. Discuss in detail mechanisms involved in respiration.
12. Discuss the anatomy of spinal cord. Explain in detail functional components of reflex arc.
13. Explain in detail the structure and functions of the organs of male reproductive system.
14. Enlist the endocrine glands with their hormones. Discuss in detail physiological actions of hormones of anterior and posterior pituitary gland.
15. Draw neat labeled diagram of respiratory system. Describe in detail pulmonary ventilation. Add a note on physiological factors affecting respiration.
16. Describe in detail the anatomy of cerebrum. Explain the functional areas of cerebrum.
17. Enlist the endocrine glands with their hormones. Explain the structure of adrenal gland. Discuss in detail the functions of adreno-corticoid hormones.
18. Explain in detail the anatomy of GI Tract with special reference to anatomy and functions of stomach,
19. Explain the acid production in the stomach, regulation of acid production through parasympathetic nervous system

Q2) Answer the following **(Marks: 3)**

1. Write a note on ventricles of brain.
2. Enlist cranial nerves with their function.
3. Explain the meninges of the CNS.
4. Define and give clinical significance of different respiratory volumes.
5. Write location and functions ofkidney.
6. Explain structure of sperm with a neat labeled diagram.
7. Write a note on Hypothalamic hormones.
8. Draw a neat labeled diagram of Nephron.
9. Enlist name and function of types of Anterior Pituitary Cells.
10. Write function of Seminal Vesicle, Prostate and Cowper'sgland.
11. Write a note on the juxtaglomerular apparatus (JGA).
12. Explain the following term 1) Vital Capacity 2) Pulmonary ventilation
13. Explain the function of CSF
14. Expalin the structure of medulla oblongata
15. Explain the structure and function of Trachea
16. Neurotransmitters
17. Reflex arc
18. Explain the structure of sperm
19. Explain physiology of micturation
20. Explain Oogenesis
21. Draw a neat labeled diagram of male reproductive system
22. Explain physiological actions of thyroid gland
23. Process of urine formation
24. Spermatogenesis
25. Renin angiotensin aldesterone system
26. Define and give clinical significance of different respiratory volumes.
27. Describe the structure and functions of Lungs.
28. Explain the structure and types of neuron.
29. Define the terms : Asthma, Emphysema andBronchitis
30. Define the terms: Cushing's Syndrome, Hypothyroidism and Diabetes Mellitus.
31. Write a note on Parathyroid Hormone.
32. Write a note on Pancreatic Islets.
33. Explain the regulation of insulin and glucagon secretion.

34. Draw a neat labeled diagram of ovary representing various stages of follicles.
35. Describe internal structure of the kidney.
36. Explain the different types of neurotransmitters with their functions.
37. Explain in brief thalamic nuclei.
38. Differentiate between sympathetic and parasympathetic divisions of the autonomic nervous system.
39. Describe the process of Oogenesis and follicular development.
40. Discuss the physiological actions of the thyroid hormones. How are the secretions of T_3 and T_4 regulated?
41. Discuss the structure and functions of urinary bladder andurethra.
42. Explain the anatomy and physiology of parathyroid gland.
43. Write in brief about the structure and functions of female reproductive system.
44. Discuss the physiological functions of autonomic nervous system.
45. Explain the role of larynx in respiration and voice production.
46. Discuss the physiological actions of parathyroid hormone and calcitonin.
47. Describe the anatomy and physiology of pancrease.
48. Explain renal clearance test.
49. Explain the structure and functions of ureter and urinary bladder.
50. Explain in detail protein synthesis.
51. Explain genetic pattern of inheritance
52. Explain in detail genes and DNA
53. Explain in detail Formation and role of ATP
54. Anatomy and functions of salivary glands
55. Explain in detail the digestion and absorption of nutrients in stomach

Q3) Write short note on (Any two) **(Marks: 10)**

1. Structure of neuron.
2. Cerebrum.
3. Spermatogenesis.
4. Calcium Homeostasis.
5. Physiology of micturition.
6. Renin angiotensin aldosterone system.
7. Reflex arc
8. Autonomic Nervous System.
9. Physiology of Lactation
10. Adrenal Glands
11. Thermoregulation.
12. Structure and functions of brain stem
13. Physiological actions of adrenocorticoid hormones.
14. Structure and functions of the limbic system.
15. Chromosomes
16. Creatinine Phosphate and BMR.
17. Small intestine and large intestine
18. Pancreas and liver
19. pepsin role in protein digestion
20. Write a note on disorders of GIT.

EXPERIMENT PLAN	
DEPARTMENT: PHARMACOLOGY	
SUBJECT NAME: HUMAN ANATOMY AND PHYSIOLOGY – II	
SUBJECT CODE: BP 207P	
NOS. OF PRACTICAL: 16	**LAB. NO.**
TEACHERS IN-CHARGE: Mrs. SANGITA BHANDARE	

Sr. No.	Experiment Title	References	Materials per Batch		Glassware		Instrument equipment with numbers
			Name	Qty	Name	Qty	
1	To study the integumentary and special senses using specimen, models,etc.	A text book of medical Laboratory &techniques by Praful B. Godkar and darshan P.Godkar Practicals of Human anatomy & physiology by Vandana Nade & Sandip G.					Microscope
2	To study the nervous system using specimen, models etc	Practical Physiology By Dr. Vijaya D. Joshi and Dr. Sadhana D. Joshi					Neubauer's Chamber

3	To study the endocrine system using specimen, models etc	A text book of medical Laboratory &techniques by Praful B. Godkar and darshan P.Godkar	70% alcohol or spirit Cotton Swabs Filter Paper	20ml 30 25			Stop Watch
4	To demonstrate the general neurological examination	Practical Physiology By Dr. Vijaya D. Joshi and Dr. Sadhana D. Joshi Anatomy, Physiology and health science by Rahul Phate	RBC diluting fluid 70% alcohol or spirit Cotton Swabs	20ml 20ml 30	RBC diluting pipette Watch glass Coverslip		Microscope Neubauer's Chamber
5	To demonstrate the function of olfactory nerve	Practical Physiology By Dr. Vijaya D. Joshi and Dr. Sadhana D. Joshi Anatomy, Physiology and health science by Rahul Phate	WBC diluting fluid 70% alcohol or spirit Cotton Swabs	20ml 20ml 30	Watch glass Coverslip		Microscope Neubauer's Chamber
6	To examine	A text book	70% alcohol	20ml			Sahli'S

	the different types of taste	of medical Laboratory &techniques by Praful B. Godkar and darshan P.Godkar	or spirit Hydrochloric acid (0.1) Cotton Swabs Distilled Water	30ml 30 50ml			haemoglobinometer
7	To demonstrate the visual activity	A text book of medical Laboratory and techniques by Praful B. Godkar and darshan P.Godkar	Leishman's stain Cedar wood oil (Immersion oil) 70% alcohol or spirit Cotton Swabs	20ml 20ml 20 ml 30	Slides Droppers		Microscope
8	To demonstrate the reflex activity	A text book of medical Laboratory and techniques by Praful B. Godkar and darshan P.Godkar Anatomy, Physiology and health science by Rahul Phate	Anti –A serum Anti-B serum Anti –D – serum 70% alcohol or spirit Cotton Swabs	20 ml 30	Glass Slides Dropper	1 1 1	Microscope
9	Recording of	Anatomy,					Sphygmomanometer

	body temperature	Physiology and health science by Rahul Phate Practicals of Human anatomy and physiology by Vandana Nade and Sandip Godse					Stethoscope
10	To demonstrate positive and negative feedback mechanism	A text book of medical Laboratory and techniques by Praful B. Godkar and darshan P.Godkar Practical Physiology By Dr. Vijaya D. Joshi and Dr. Sadhana D. Joshi Anatomy, Physiology and health science by	70% alcohol or spirit Cotton Swabs	20 m 30	Capillary glass tubes		Stop watch

		Rahul Phate					
11	Determination of tidal volume and vital capacity	"Principles of Anatomy Physiology" Gerard J.Tortara Sandra Reynold's Grabowiski "Ross and Wilson" Anatomy and physiology in health and illness					Human Skeleton system model Disorganised bones
12	Study of digestive ,respiratory ,cardiovascular systems, urinary and reproductive systems with the help of models, charts and specimens	"Principles of Anatomy Physiology" Gerard J.Tortara Sandra Reynold's Grabowiski "Ross and Wilson" Anatomy and physiology in health and illness					Different Permanent slides
13	Recording of basal mass	E-media					Powerpoint Presentation

	index						
14	Study of family planning devices and pregnancy diagnosis test	Anatomy, Physiology and health science by Rahul Phate "Principles of Anatomy Physiology" Gerard J.Tortara Sandra Reynold's Grabowiski					Powerpoint Presentation
15	Demonstration of total blood count by cell analyser	A text book of medical Laboratory &techniques by Praful B. Godkar and darshan P.Godkar					Powerpoint Presentation
16	Permanent slides of vital organs and gonads						

Subject II

PHARMACEUTICAL ORGANIC CHEMISTRY –I

(POC-I)

Scheme

Course of study

Course Code	Course Name	Lectures Assigned			
		Theory	Practical	Tutorial	Total
BP202T	POC-I	03	-	01	04
BP208P	POC-I	-	04	-	02

Schemes for internal assessments and end semester examinations

Course Code	Course Name	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams					
			Marks	Duration	Total	Marks	Duration	
BP202T	POC-I	10	15	1 Hrs	25	75	3 Hrs	100
BP208P	POC-I	5	10	4 Hrs	15	35	4 Hrs	50

BP202T. PHARMACEUTICAL ORGANIC CHEMISTRY –I

(Theory)

45 Hours

Scope:

This subject deals with classification and nomenclature of simple organic compounds, structural isomerism, intermediates forming in reactions, important physical properties, reactions and methods of preparation of these compounds. The syllabus also emphasizes on mechanisms and orientation of reactions.

Course Delivery:

The course will be delivered through lectures, class room interaction, and presentations.

Course Objectives:

Upon completion of the course student shall be able to

- write the structure, name and the type of isomerism of the organic compound
- write the reaction, name the reaction and orientation of reactions
- account for reactivity/stability of compounds
- identify/confirm the identification of organic compound

COURSE CONTENT	
UNIT-I	**07 Hours**
Classification, nomenclature and isomerism Classification of Organic Compounds, Common and IUPAC systems of nomenclature of organic compounds (up to 10 Carbons open chain and carbocyclic compounds) Structural isomerisms in organic compounds	
UNIT-II	**10 Hours**
Alkanes*, Alkenes* and Conjugated dienes* SP_3 hybridization in alkanes, Halogenation of alkanes, uses of paraffins. Stabilities of alkenes, SP_2 hybridization in alkenes E_1 and E_2 reactions – kinetics, order of reactivity of alkyl halides, rearrangement of carbocations, Saytzeffs orientation and evidences. E_1 verses E_2 reactions, Factors affecting E_1 and E_2 reactions. Ozonolysis, electrophilic addition reactions of alkenes, Markownikoff's orientation, free radical addition reactions of alkenes, Anti Markownikoff's orientation. Stability of conjugated dienes, Diel-Alder, electrophilic addition, free radical addition reactions of conjugated dienes, allylic rearrangement	
UNIT-III	**10 Hours**
Alkyl halides* SN_1 and SN_2 reactions - kinetics, order of reactivity of alkyl halides, stereochemistry and rearrangement of carbocations. SN_1 versus SN_2 reactions, Factors affecting SN_1 and SN_2 reactions Structure and uses of ethylchloride, Chloroform, trichloroethylene, tetrachloroethylene, dichloromethane, tetrachloromethane and iodoform. **Alcohols*-** Qualitative tests, Structure and uses of Ethyl alcohol, Methyl alcohol, chlorobutanol, Cetosteryl alcohol, Benzyl alcohol, Glycerol, Propylene glycol	
UNIT-IV	**10 Hours**
Carbonyl compounds* (Aldehydes and ketones) Nucleophilic addition, Electromeric effect, aldol condensation, Crossed Aldol condensation, Cannizzaro reaction, Crossed Cannizzaro reaction, Benzoin condensation, Perkin condensation, qualitative tests, Structure and uses of Formaldehyde, Paraldehyde, Acetone, Chloral hydrate, Hexamine, Benzaldehyde, Vanilin, Cinnamaldehyde.	
UNIT-V	**08 Hours**

Carboxylic acids*

Acidity of carboxylic acids, effect of substituents on acidity, inductive effect and qualitative tests for carboxylic acids ,amide and ester

Structure and Uses of Acetic acid, Lactic acid, Tartaric acid, Citric acid, Succinic acid. Oxalic acid, Salicylic acid, Benzoic acid, Benzyl benzoate, Dimethyl phthalate, Methyl salicylate and Acetyl salicylic acid

Aliphatic amines* - Basicity, effect of substituent on Basicity. Qualitative test, Structure and uses of Ethanolamine, Ethylenediamine, Amphetamine

Recommended Books: (Latest Editions)

1. Organic Chemistry byMorrison and Boyd
2. Organic Chemistry by I.L. Finar , Volume-I
3. Textbook of Organic Chemistry by B.S. Bahl & Arun Bahl.
4. Organic Chemistry by P.L.Soni
5. Practical Organic Chemistry byMann and Saunders.
6. Vogel's text book of Practical Organic Chemistry
7. Advanced Practical organic chemistry by N.K.Vishnoi.
8. Introduction to Organic Laboratory techniques by Pavia, Lampman and Kriz.
9. Reaction and reaction mechanism by Ahluwaliah/ Chatwal.

LESSON PLAN			
S. No	**Topic**	**No. of hours**	**Name of the faculty**
Unit I	**Classification, nomenclature and isomerism** Classification of Organic Compounds	2	Mr.V.M.Dhamak
	Common and IUPAC systems of nomenclature of organic compounds (up to 10 Carbons open chain and carbocyclic compounds)	3	
	Structural isomerisms in organic compounds	2	
Unit II	**Alkanes*, Alkenes* and Conjugated dienes*** SP3 hybridization in alkanes, Halogenation of alkanes, uses of paraffins. Stabilities of alkenes, SP2 hybridization in alkenes	2	Mr.V.M.Dhamak
	E1 and E2 reactions – kinetics, order of reactivity of alkyl halides	1	
	Rearrangement of carbocations, Saytzeffs orientation and evidences	1	
	E1 verses E2 reactions, Factors affecting E1 and E2 reactions.	1	
	Ozonolysis	1	
	Electrophilic addition reactions of alkenes,	1	
	Markownikoff's orientation, free radical addition reactions of alkenes, Anti Markownikoff's orientation.	1	
	Stability of conjugated dienes, Diel-Alder, electrophilic addition,	1	
	Free radical addition reactions of conjugated dienes, allylic rearrangement	1	
Unit III	**Alkyl halides** SN1 and SN2 reactions - kinetics, order of reactivity of alkyl halides, stereochemistry and rearrangement of carbocations.	3	Mr.V.M.Dhamak
	SN1 versus SN2 reactions, Factors affecting SN1 and SN2 reactions	2	

	Structure and uses of ethylchloride, Chloroform, trichloroethylene, tetrachloroethylene, dichloromethane, tetrachloromethane and iodoform.	3	
	Alcohols- Qualitative tests, Structure and uses of Ethyl alcohol, chlorobutanol, Cetosteryl alcohol, Benzyl alcohol, Glycerol, Propylene glycol	2	
Unit IV	**Carbonyl compounds (Aldehydes and ketones)** Nucleophilic addition	1	Mr.V.M.Dhamak
	Electromeric effect	1	
	Aldol condensation	1	
	Crossed Aldol condensation	1	
	Cannizzaro reaction	1	
	Crossed Cannizzaro reaction	1	
	Benzoin condensation	1	
	Perkin condensation	1	
	Qualitative tests:Structure and uses of Formaldehyde, Paraldehyde, Acetone, Chloral hydrate, Hexamine, Benzaldehyde, Vanilin, Cinnamaldehyde.	2	
Unit V	**Carboxylic acids** Acidity of carboxylic acids, effect of substituents on acidity, inductive effect and qualitative tests for carboxylic acids ,amide and ester	3	Mr.V.M.Dhamak
	Structure and Uses of Acetic acid, Lactic acid, Tartaric acid, Citric acid, Succinic acid. Oxalic acid, Salicylic acid, Benzoic acid, Benzyl benzoate, Dimethyl phthalate, Methyl salicylate and Acetyl salicylic acid	3	
	Aliphatic amines* - Basicity, effect of substituent on Basicity. Qualitative test, Structure and uses of Ethanolamine, Ethylenediamine, Amphetamine	2	
Total No. Hours		**45**	1

QUESTION BANK

Q.1 Classify Organic Compounds

Q.2 Write rules for IUPAC systems of nomenclature of organic compounds

Q.3 Write note on structural isomerisms in organic compounds.

Q.4Write note on SP3 hybridization in alkanes

Q.5Write note on halogenation of alkanes

Q.6 What are uses of paraffins?

Q.7 Write note on stabilities of alkenes.

Q.8 Write note on SP2 hybridization in alkenes.

Q.9 Write note on E1 and E2 reactions – kinetics, order of reactivity of alkyl halides

Q.10 Write note on rearrangement of carbocations,

Q.11 What are Saytzeffs orientation and evidences.

Q.12 Distinguish between E1 verses E2 reactions.

Q.13What are factors affecting E1 and E2 reactions.

Q.14 Write note on Ozonolysis,

Q.15 Write note on electrophilic

Q.16 Write note on addition reactions of alkenes.

Q.17What is Markownikoff's orientation andAnti Markownikoff's orientation.

Q.18 Write note on stability of conjugated dienes.

Q.19 Write note on Diel-Alder reaction.

Q.20 Write note on electrophilic addition reaction.

Q.21 Write note on free radical addition reactions of conjugated dienes.

Q.22 Write note on allylic rearrangement.

Q.23 Write note on SN1 and SN2 reactions .

Q.24 Write note on SN1 and SN2 reactions kinetics, order of reactivity of alkyl halides, stereochemistry.

Q.25 Write note on rearrangement of carbocations.

Q.26 Distinguish between SN1 versus SN2 reactions,

Q.27 What are factors affecting SN1 and SN2 reactions

Q.28Structure and uses of

a.Ethylchloride,

b.Chloroform,

c.Trichloroethylene,

d.Tetrachloroethylene,

e.Dichloromethane,

f.Tetrachloromethane

g.Iodoform.

Q.29 Write Qualitative tests, Structure and uses

a.Ethyl alcohol

b.Chlorobutanol

c.Cetosteryl alcohol

d.Benzyl alcohol

e.Glycerol

f.Propylene glycol

Q.30Write note on carbonyl nucleophilic addition reaction.

Q.31Write note on Electromeric effect

Q.32Write note on aldol condensation,

Q.33Write note on Crossed Aldol condensation,

Q.34Write note on Cannizzaro reaction,

Q.35Write note on Crossed Cannizzaro reaction,

Q.36Write note on Benzoin condensation,

Q.37Write note on Perkin condensation,

Q.38Write note on qualitative tests, Structure and uses of Formaldehyde, Paraldehyde, Acetone, Chloral hydrate, Hexamine, Benzaldehyde, Vanilin, Cinnamaldehyde.

Q.39 Write note on acidity of carboxylic acids.

Q.40Write note on effect of substituents on acidity of carboxylic acid.

Q.41Write note on inductive effect on carboxylic acid.

Q.42Write qualitative tests for carboxylic acids ,amide and ester

Q.42Write structure and Uses of Acetic acid, Lactic acid, Tartaric acid, Citric acid, Succinic acid. Oxalic acid, Salicylic acid, Benzoic acid, Benzyl benzoate, Dimethyl phthalate, Methyl salicylate and Acetyl salicylic acid.

Q.43Write note on aliphatic amines basicity.

Q.44 Write note on aliphatic amines effect of substituent on Basicity.

Q.45Write qualitative test, Structure and uses of Ethanolamine, Ethylenediamine, Amphetamine.

EXPERIMENT PLAN	
DEPARTMENT: PHARMACEUTICAL CHEMISTRY	
SUBJECT NAME: PHARMACEUTICAL ORGANIC CHEMISTRY-I (PRACTICAL)	
SUBJECT CODE:BP208P	
NOS. OF PRACTICAL: 15	**LAB. NO. :1**
TEACHERS IN-CHARGE: MR.V.M.DHAMAK	

Sr. No.	Experiment Title	References	Materials per Batch		Glassware		Instrument equipment with numbers
			Name	Qty	Name	Qty	
1	To identify unknown compound by Organic Qualitative Analysis (Resorcinol)	Experimental Pharmaceutical Organic chemistry by K. S. Jain Carrier Publication	Resorcinol Conc. HCl solution Conc.H2SO4 solution Br2 water NaOH solution KOH solution Chloroform Sodium Nitroprusside solution Conc.HNO3 NAHCO3 solution	15 g 20 ml 20 ml 20 ml 20 ml 20 ml 20 ml 10 ml 10 ml 10 ml	Beaker. Test tube, funnel, glass rod,	20	Test tube (20)
2	To identify unknown compound by Organic Qualitative Analysis (m-nitro aniline)	Experimental Pharmaceutical Organic chemistry by K. S. Jain Carrier Publication	m-nitro aniline Conc. HCl solution Conc.H2SO4 solution Br2 water NaOH solution KOH solution Chloroform Sodium Nitroprusside solution Conc.HNO3	15 g 20 ml 20 ml 20 ml 20 ml 20 ml 20 ml 10 ml 10 ml	Beaker. Test tube, funnel, glass rod,	20	Test tube (20)

			NAHCO3 solution	10 ml			
3	To identify unknown compound by Organic Qualitative Analysis (Phthalic acid)	Experimental Pharmaceutical Organic chemistry by K. S. Jain Carrier Publication	Phthalic acid Conc. HCl solution Conc.H2SO4 solution Br2 water NaOH solution KOH solution Chloroform Sodium Nitroprusside solution Conc.HNO3 NAHCO3 solution	30 ml 20 ml 20 ml 20 ml 20 ml 20 ml 20 ml 10 ml 10 ml 10 ml	Beaker. Test tube, funnel, glass rod,	20	Test tube (20)
4	To identify unknown compound by Organic Qualitative Analysis (Oxalic acid)	Experimental Pharmaceutical Organic chemistry by K. S. Jain Carrier Publication	Oxalic acid Conc. HCl solution Conc.H2SO4 solution Br2 water NaOH solution KOH solution Chloroform Sodium Nitroprusside solution Conc.HNO3 NAHCO3 solution	15 g 20 ml 20 ml 20 ml 20 ml 20 ml 20 ml 10 ml 10 ml 10 ml	Beaker. Test tube, funnel, glass rod,	20	Test tube (20)
5	To identify unknown compound by Organic Qualitative Analysis (Acetamide)	Experimental Pharmaceutical Organic chemistry by K. S. Jain Carrier Publication	Acetamide Conc. HCl solution Conc.H2SO4 solution Br2 water NaOH solution	15 g 20 ml 20 ml 20 ml 20 ml	Beaker. Test tube, funnel, glass rod,	20	Test tube (20)

			KOH solution Chloroform Sodium Nitroprusside solution Conc.HNO3 NAHCO3 solution	20 ml 20 ml 10 ml 10 ml 10 ml			
6	To identify unknown compound by Organic Qualitative Analysis (Benzil)	Experimental Pharmaceutical Organic chemistry by K. S. Jain Carrier Publication	Benzil Conc. HCl solution Conc.H2SO4 solution Br2 water NaOH solution KOH solution Chloroform Sodium Nitroprusside solution Conc.HNO3 NAHCO3 solution	15 g 20 ml 20 ml 20 ml 20 ml 20 ml 20 ml 10 ml 10 ml 10 ml	Beaker. Test tube, funnel, glass rod,	20	Test tube (20)
7	To identify unknown compound by Organic Qualitative Analysis (Ethyl Benzoate)	Experimental Pharmaceutical Organic chemistry by K. S. Jain Carrier Publication	Ethyl Benzoate Conc. HCl solution Conc.H2SO4 solution Br2 water NaOH solution KOH solution Chloroform Sodium Nitroprusside solution Conc.HNO3 NAHCO3 solution	30 ml 20 ml 20 ml 20 ml 20 ml 20 ml 20 ml 10 ml 10 ml 10 ml	Beaker. Test tube, funnel, glass rod,	20	Test tube (20)
8	To identify unknown compound by Organic Qualitative	Experimental Pharmaceutical Organic	o-chloro benzoic acid Conc. HCl	30 ml 20 ml	Beaker. Test tube,	20	Beaker (20)

	Analysis (o-chloro benzoic acid)	chemistry by K. S. Jain Carrier Publication	solution Conc.H2SO4 solution Br2 water NaOH solution KOH solution Chloroform Sodium Nitroprusside solution Conc.HNO3 NAHCO3 solution	 20 ml 20 ml 20 ml 20 ml 20 ml 10 ml 10 ml 10 ml	funnel, glass rod,		
9	To identify unknown compound by Organic Qualitative Analysis (Oxalic acid)	Experimental Pharmaceutical Organic chemistry by K. S. Jain Carrier Publication	Oxalic acid Conc. HCl solution Conc.H2SO4 solution Br2 water NaOH solution KOH solution Chloroform Sodium Nitroprusside solution Conc.HNO3 NAHCO3 solution	15gm 20 ml 20 ml 20 ml 20 ml 20 ml 20 ml 10 ml 10 ml 10 ml	Beaker. Test tube, funnel, glass rod,	20	Beaker (20)
10	Synthesis of Benzanilide	Experimental Pharmaceutical Organic chemistry by Vogel	Benzene Aniline Benzoyl Chloride Glacial acetic acid Alcohol	30 ml 20 ml 80 ml 60 ml 90 ml	Beaker. Conical Flask, funnel, glass rod	10	Beaker (20)

11	Synthesis of Aspirin	Experimental Pharmaceutical Organic chemistry by Vogel	Salicylic acid Conc.H2SO4 Conc. HNO3 Glacial acetic acid Alcohol	15gm 20 ml 20 ml 50 ml 50 ml	Beaker. Conical Flask, funnel, glass rod	10	Beaker (20)
12	Synthesis of Benzophenone oxime.	Experimental Pharmaceutical Organic chemistry by Vogel	Benzene phenol Conc.H2SO4 Conc. HNO3 Glacial acetic acid Alcohol	30 ml 20 ml 20 ml 50 ml 50 ml 50 ml	Beaker. Conical Flask, funnel, glass rod	10	Beaker (20)
13	Synthesis of Hydrazone	Experimental Pharmaceutical Organic chemistry by Vogel	Benzene Conc.H2SO4 Glacial acetic acid Chloroform Alcohol	30 ml 20 ml 20 ml 50 ml 60 ml	Beaker. RBF, Conical Flask, funnel, glass rod	10	RBF (20)
14	Synthesis of Hippuric acid	Experimental Pharmaceutical Organic chemistry by Vogel	Acetanilide Conc.H2SO4 Conc. HNO3 Glacial acetic acid Alcohol	15gm 20 ml 20 ml 50 ml 50 ml	Beaker. Conical Flask, funnel, glass rod	10	Beaker (20)

Subject III

BIOCHEMISTRY

Scheme

Course of study

Course Code	Course Name	Lectures Assigned			
		Theory	Practical	Tutorial	Total
BP203T	Biochemistry	03	-	01	04
BP209P	Biochemistry	-	04	-	02

Schemes for internal assessments and end semester examinations

Course Code	Course Name	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams					
			Marks	Duration	Total	Marks	Duration	
BP203T	Biochemistry	10	15	1 Hrs	25	75	3 Hrs	100
BP209P	Biochemistry	5	10	4 Hrs	15	35	4 Hrs	50

BP203T. BIOCHEMISTRY

(Theory)

45 Hours

Scope:

Biochemistry deals with complete understanding of the molecular levels of the chemical process associated with living cells. The scope of the subject is providing biochemical facts and the principles to understand metabolism of nutrient molecules in physiological and pathological conditions. It is also emphasizing on genetic organization of mammalian genome and hetero & autocatalytic functions of DNA.

Course Delivery:

The course will be delivered through lectures, class room interaction, and presentations.

Course Objectives:

Upon completion of this course the student should be able to:

- Understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes.
- Understand the metabolism of nutrient molecules in physiological and pathological conditions.
- Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.

COURSE CONTENT	
UNIT-I	**08 Hours**

Biomolecules

Introduction, classification, chemical nature and biological role of carbohydrate, lipids, nucleic acids, amino acids and proteins.

Bioenergetics

Concept of free energy, endergonic and exergonic reaction, Relationship between free energy, enthalpy and entropy; Redox potential.

Energy rich compounds; classification; biological significances of ATP and cyclic AMP

UNIT-II	**10 Hours**

Carbohydrate metabolism

Glycolysis – Pathway, energetics and significance

Citric acid cycle- Pathway, energetics and significance

HMP shunt and its significance; Glucose-6-Phosphate dehydrogenase (G6PD) deficiency

Glycogen metabolism Pathways and glycogen storage diseases (GSD)

Gluconeogenesis- Pathway and its significance

Hormonal regulation of blood glucose level and Diabetes mellitus

Biological oxidation

Electron transport chain (ETC) and its mechanism.

Oxidative phosphorylation & its mechanism and substrate phosphorylation

Inhibitors ETC and oxidative phosphorylation/Uncouplers level

UNIT-III	**10 Hours**

Lipid metabolism

β-Oxidation of saturated fatty acid (Palmitic acid)

Formation and utilization of ketone bodies; ketoacidosis

De novo synthesis of fatty acids (Palmitic acid)

Biological significance of cholesterol and conversion of cholesterol into

bile acids, steroid hormone and vitamin D

Disorders of lipid metabolism: Hypercholesterolemia, atherosclerosis, fatty liver and obesity.

Amino acid metabolism

General reactions of amino acid metabolism: Transamination, deamination & decarboxylation, urea cycle and its disorders

Catabolism of phenylalanine and tyrosine and their metabolic disorders (Phenyketonuria, Albinism,

alkeptonuria, tyrosinemia)

Synthesis and significance of biological substances; 5-HT, melatonin, dopamine, noradrenaline, adrenaline

Catabolism of heme; hyperbilirubinemia and jaundice

UNIT-IV	**10 Hours**

Nucleic acid metabolism and genetic information transfer

Biosynthesis of purine and pyrimidine nucleotides

Catabolism of purine nucleotides and Hyperuricemia and Gout disease

Organization of mammalian genome

Structure of DNA and RNA and their functions

DNA replication (semi conservative model)

Transcription or RNA synthesis

Genetic code, Translation or Protein synthesis and inhibitors

UNIT-V	**07 Hours**

Enzymes

Introduction, properties, nomenclature and IUB classification of enzymes

Enzyme kinetics (Michaelis plot, Line Weaver Burke plot), Enzyme inhibitors with examples

Regulation of enzymes: enzyme induction and repression, allosteric enzymes regulation

Therapeutic and diagnostic applications of enzymes and isoenzymes

Coenzymes –Structure and biochemical functions

Recommended Books: (Latest Editions)

1. Principles of Biochemistry by Lehninger.
2. Harper's Biochemistry by Robert K. Murry, Daryl K. Granner and Victor W. Rodwell.
3. Biochemistry by Stryer.
4. Biochemistry by D. Satyanarayan and U.Chakrapani
5. Textbook of Biochemistry by Rama Rao.
6. Textbook of Biochemistry by Deb.
7. Outlines of Biochemistry by Conn and Stumpf
8. Practical Biochemistry by R.C. Gupta and S. Bhargavan.
9. Introduction of Practical Biochemistry by David T. Plummer. (3rd Edition)
10. Practical Biochemistry for Medical students by Rajagopal and Ramakrishna.
11. Practical Biochemistry by Harold Varley.

LESSON PLAN			
S. No	**Topic**	**No. of hours**	**Name of the faculty**
Unit I	**Biomolecules:** **Carbohydrate:** Introduction and classification, lipids, nucleic acids, amino acids and proteins.	1	Mr. Vinayak Gaware
	chemical nature and biological role of carbohydrates	1	
	Lipids and Nucleic acid: Introduction and classification chemical nature and biological role of lipids.	1	
	Amino acids and proteins: Introduction and classification chemical nature and biological role of lipids.	1	
	Bioenergetics: Concept of free energy, endergonic and exergonic reaction	1	
	Relationship between free energy, enthalpy and entropy	1	
	Redox potential	1	
	Energy rich compounds; classification; biological significances of ATP and cyclic AMP	1	
Unit II	**Carbohydrate metabolism:** Glycolysis – Pathway, energetics and significance	1	Mr.Vinayak Gaware
	Citric acid cycle- Pathway, energetics and significance	1	
	HMP shunt and its significance; Glucose-6-Phosphate dehydrogenase (G6PD) deficiency	1	
	Glycogen metabolism Pathways and glycogen storage diseases (GSD)	1	
	Gluconeogenesis- Pathway and its significance	1	
	Hormonal regulation of blood glucose level and Diabetes mellitus	1	
	Biological oxidation: Electron transport chain (ETC) and its mechanism.	1	
	Oxidative phosphorylation	1	
	Mechanism and substrate phosphorylation.	1	

	Inhibitors ETC and oxidative phosphorylation/Uncouplers Level	1	
Unit III	**Lipid metabolism:** β-Oxidation of saturated fatty acid (Palmitic acid)	1	Mr. Vinayak Gaware
	Formation and utilization of ketone bodies; ketoacidosis.	1	
	De novo synthesis of fatty acids (Palmitic acid)	1	
	Biological significance of cholesterol and conversion of cholesterol into bile acids, steroid hormone and vitamin D	1	
	Disorders of lipid metabolism: Hypercholesterolemia, atherosclerosis, fatty liver and obesity.	1	
	Amino acid metabolism: General reactions of amino acid metabolism: Transamination, deamination & decarboxylation, urea cycle and its disorders	1	
	Catabolism of phenylalanine and tyrosine and their metabolic disorders (Phenyketonuria, Albinism)	1	
	Catabolism of phenylalanine and tyrosine and their metabolic disorders (Alkeptonuria, tyrosinemia)	1	
	Synthesis and significance of biological substances; 5-HT, melatonin, dopamine, noradrenaline, adrenaline	1	
	Catabolism of heme; hyperbilirubinemia and jaundice	1	
Unit IV	**Nucleic acid metabolism and genetic information transfer:** Biosynthesis of purine nucleotides	1	Mr. Vinayak Gaware
	Biosynthesis of pyrimidine nucleotides	1	
	Catabolism of purine nucleotides and Hyperuricemia and Gout disease	1	
	Catabolism of Hyperuricemia and Gout disease	1	
	Organization of mammalian genome	1	
	Structure of DNA and RNA and their function	1	
	Structure of RNA and their function	1	

Unit V	DNA replication (semi conservative model)	1	Mr. Vinayak Gaware
	Transcription or RNA synthesis Genetic code,	1	
	Translation or Protein synthesis and inhibitors	1	
	Enzymes: Introduction, properties, nomenclature and IUB classification of enzymes	1	
	Enzyme kinetics (Michaelis plot, Line Weaver Burke plot)	1	
	Enzyme inhibitors with examples	1	
	Regulation of enzymes: enzyme induction and repression	1	
	Allosteric Enzymes Regulation	1	
	Therapeutic and diagnostic applications of enzymes and isoenzymes	1	
	Coenzymes –Structure and biochemical functions	1	
TOTAL NUMBER OF HOURS		**45**	**1**

QUESTION BANK

1. Outline the Embden-Meyerhof pathway of glycolysis diagrammatically.
2. Give diagrammatic outline of citric acid (TCA) cycle.
3. Explain HMP shunt and its significance.
4. Describe the main pathway of gluconeogenesis.
5. Enlist various types of glycogen storage diseases (GSDs). Explain clinical and biochemical features of first two types (Type I and Type II)
6. What is terminal oxidation? Describe the structure and function of electron transport system (ETS) in detail.
7. Describe the mechanism of oxidative phosphorylation.
8. Write a note on inhibitors of electron transport chain and its inherited disorders.
9. What is beta oxidation? Where does it occur? Describe the role of carnitine in fatty acid metabolism.
10. Write a note on de novo synthesis of fatty acid.
11. Write an explanatory note on fatty liver disease.
12. Describe briefly synthesis of cholesterol.
13. How is Urea cycle regulated? Describe some inherited disorders of urea cycle.
14. Give diagrammatic representation of heme catabolism.
15. Give disorders of aromatic amino metabolism.
16. Describe biosynthesis of Pyrimidine nucleotides.
17. Describe the catabolism of purine nucleotides.
18. Explain the structure of DNA and RNA and their functions in detail.
19. Describe the role of rRNA in Protein synthesis.
20. Name various stages of RNA synthesis. Describe any one stage in detail.
21. Write a note on DNA replication.
22. Define and classify the carbohydrates. Give the structure of Glucose.
23. What are glycosides? Give their biomedical importance.
24. Give a brief classification of Lipids.
25. What are different types of fatty acids? How are they classified?
26. Describe the functions of Prostaglandins.
27. Write a short note on cyclic AMP and GMP.
28. Give a brief classification of amino acids on the basis of their nutritional requirements.
29. Describe the biomedical importance of proteins.

30. Write a note on energy rich compounds in biological systems.
31. What are enzymes? Write a short note on the chemical nature of enzymes.
32. What are coenzymes? Give their classification with important examples.
33. Write a note on Michaelis Menten Equation.
34. Describe the competitive inhibition of enzyme action.
35. What are therapeutic uses of enzymes.

EXPERIMENT PLAN							
DEPARTMENT: PHAMACEUTICAL CHEMISTRY							
SUBJECT NAME:BIOCHEMISTRY			**SUBJECT CODE:242P**				
NOS. OF PRACTICAL: 12			**LAB. NO.**				
TEACHERS IN-CHARGE: Mr. VINAYAK GAWARE							
S. No.	**Experiment Title**	**References**	**Materials per Batch**		**Glassware**		**Instrument equipment with numbers**
			Name	**Qty**	**Name**	**Qty**	
1	Qualitative analysis of carbohydrates (Glucose, Fructose, Lactose, Maltose, Sucrose and starch)	Kale S.R., Kale R.R., Practical Biochemistry & Clinical Pathology, Nirali prakahan, 24th edition july 2015, Pg no-4-9	Molish reagent, Iodine, Barfords reagent, H_2SO_4, fehilings regent, Saliwanof reagent, Benidits regent Alpha napthol	5 ml	Test tube, Test tube stand, Test tube holder, Beaker, Slide, Slide cover	20	Microscope
2	Identification tests for Proteins (albumin and Casein)	Kale S.R., Kale R.R., Practical Biochemistry & Clinical Pathology, Nirali prakahan, 24th edition july 2015, Pg no-10-16	Albumin, casein, 10% NaOH, 1% $CUSO_4$, Ninhydrin sol, HNO_3, 40% NaOH, Formaline, H_2SO_4	1gm sample 5 ml sol	Test tube, Test tube stand, Test tube holder, Beaker	20	--
3	Quantitative analysis of reducing sugars (DNSA method) and Proteins (Biuret method)	David Plummer "An introduction to Practical Biochemistry" 3rd Ed, Mc Graw Hill Education, Page no159	Albumin, Biuret reagent	0.5mg 10ml	Test tube, Test tube stand, Test tube holder, Beaker, Burette	20	--
4	Qualitative analysis of urine for abnormal constituents	Kale S.R., Kale R.R., Practical Biochemistry & Clinical Pathology, Nirali prakahan, 24th edition july 2015, Pg no-24-26	Acetic Acid, Na2CO3, Conc. HNO3, Benedict & Fehling Reagent Sulphosalic acid, Chlorophenol red, Solid	10ml 10ml 40ml 55ml 45ml 10ml 10ml	Test tube, Test tube stand, Test tube holder	20	----

			[(NH4)2SO4], Sodium Nitroprusside, Strong Ammonia, Benzidine powder, H2O2, Sulphur, HCl				
5	To determine unknown concentration of Creatinine in given sample of serum by reagent method	Godkar P.B., Godkar D.P., Textbook of medical laboratory Technology, 2nd edition (reprint) 2011, Bhalani Publication House, Mumbai, India pg no-320-325.	Reagent 1, Regent 2, Std, Serum sample	1ml 1ml 1ml 10ul	Cuvette, Pipette, Measuring cylinder, Beaker	3 2 1 1	Photoelectric colorimeter, Micropipette
6	Determination of blood sugar	Triender. P. 1969. Ann din Biochem 624. Tietz N.W. 1982 fundamentals of clinicalchemistry 2nd ed.	Dist. Water, GOD-POD reagent, Std(100mg/dl), Std(500mg/dl), Test glucose, Test sample	10ml 18ml 30 ml 30ml 30ml 30ml	Cuvette, Pipette, Measuring cylinder, Beaker	5 2 1 1	Calorimeter, Micropipette
7	Determination of serum total cholesterol	Trinder, P, (1969) Ann, Clin. Biochem, 6:24, Allain C.C and al clin chem. 20, (1974), 470	Cholesterol reagent, Std, Serum sample	3ml 10ml 10ml	Cuvette, Pipette, Measuring cylinder, Beaker	3 2 1 1	Photoelectric colorimeter, Micropipette
8	Preparation of buffer solution and measurement of pH	Kale S.R., Kale R.R., Practical Biochemistry & Clinical Pathology, Nirali prakahan, 24th edition july 2015, Pg no-30-35	Acetate buffer	10 ml	Beaker Volu.flask	20	pH meter
9	Study of enzymatic hydrolysis of starch	David Plummer "An introduction to Practical Biochemistry" 3rd Ed, Mc Graw Hill Education, Page no240	Saliva sample, NaCl, Acetate buffer, Amylase extract, NaOH	1ml 05% 10ml 100ml 0.5N	Test-tube, vol flask	20	Centrifuge, colorimeter

10	Determination of Salivary amylase activity	David Plummer "An introduction to Practical Biochemistry" 3rd Ed, Mc Graw Hill Education, Page no240	Saliva sample, NaCl, Acetate buffer, Amylase extract, NaOH	1ml 05% 10ml 100ml 0.5N	Test-tube, vol flask	20	Centrifuge, colorimeter
11	Study the effect of Temperature on Salivary amylase activity.	David Plummer "An introduction to Practical Biochemistry" 3rd Ed, Mc Graw Hill Education, Page no241	Saliva sample, NaCl, Acetate buffer, Amylase extract, NaOH	1ml 05% 10ml 100ml 0.5N	Test-tube, vol flask	20	Thermometer, Centrifuge, colorimeter
12	Study the effect of substrate concentration on salivary amylase activity.	David Plummer "An introduction to Practical Biochemistry" 3rd Ed, Mc Graw Hill Education, Page no242	Saliva sample, NaCl, Acetate buffer, Amylase extract, NaOH	1ml 05% 10ml 100ml 0.5N	Test-tube, vol flask	20	Thermometer, Centrifuge, colorimeter

Subject IV

PATHOPHYSIOLOGY

Scheme

Course of study

Course Code	Course Name	Lectures Assigned			
		Theory	Practical	Tutorial	Total
BP204T	Pathophysiology	03	-	01	04

Schemes for internal assessments and end semester examinations

Course Code	Course Name	Internal Assessment				End Semester Exams		Total Marks
			Sessional Exams					
		Continuous Mode	Marks	Duration	Total	Marks	Duration	
BP204T	Pathophysiology	10	15	1 Hrs	25	75	3 Hrs	100

BP204T. PATHOPHYSIOLOGY

(Theory)

45 Hours

Scope:

Pathophysiology is the study of causes of diseases and reactions of the body to such disease producing causes.This course is designed to impart a thorough knowledge of the relevant aspects of pathology of various conditions with reference to its pharmacological applications, and understanding of basic Pathophysiological mechanisms. Hence it will not only help to study the syllabus of pathology, but also to get baseline knowledge required to practice medicine safely, confidently, rationally and effectively.

Course Delivery:

The course will be delivered through lectures, class room interaction, and presentations.

Course Objectives:

Upon completion of course student shall be able to

- Describe the etiology and pathogenesis of the selected disease states;
- Name the signs and symptoms of the diseases; and
- Mention the complications of the diseases.

COURSE CONTENT	
UNIT I	**10 Hours**
Basic principles of Cell injury and Adaptation: Introduction, definitions, Homeostasis, Components and Types of Feedback systems, Causes of cellular injury**,** Pathogenesis (Cell membrane damage, Mitochondrial damage, Ribosome damage, Nuclear damage)**,**Morphology of cell injury – Adaptive changes (Atrophy, Hypertrophy, hyperplasia, Metaplasia, Dysplasia)**,**Cell swelling, Intra cellular accumulation, Calcification, Enzyme leakage and Cell Death Acidosis &Alkalosis, Electrolyte imbalance **Basic mechanism involved in the process of inflammation and repair:** Introduction, Clinical signs of inflammation, Different types of Inflammation, Mechanism of Inflammation – Alteration in vascular permeability and blood flow, migration of WBC's, Mediators of inflammation, Basic principles of wound healing in the skin, Pathophysiology of Atherosclerosis	
UNIT II	**10 Hours**
Cardiovascular System: Hypertension, congestive heart failure, ischemic heart disease (angina,myocardial infarction, atherosclerosis and arteriosclerosis) **Respiratory system:** Asthma, Chronic obstructive airways diseases. **Renal system:** Acute and chronic renal failure	
UNIT III	**10 Hours**
Haematological Diseases: Iron deficiency, megaloblastic anemia (Vit B12 and folic acid), sickle cell anemia, thalasemia, hereditary acquired anemia, hemophilia **Endocrine system:** Diabetes, thyroid diseases, disorders of sex hormones **Nervous system:** Epilepsy, Parkinson's disease, stroke, psychiatric disorders: depression, schizophrenia and Alzheimer's disease. **Gastrointestinal system:** Peptic Ulcer	
UNIT IV	**08 Hours**
Inflammatory bowel diseases, jaundice, hepatitis (A,B,C,D,E,F) alcoholic liver disease. **Disease of bones and joints:** Rheumatoid arthritis, osteoporosis and gout **Principles of cancer:** classification, etiology and pathogenesis of cancer **Diseases of bones and joints:** Rheumatoid Arthritis, Osteoporosis,Gout **Principles of Cancer:** Classification, etiology and pathogenesis of Cancer	
UNIT V	**07 Hours**
Infectious diseases: Meningitis,Typhoid, Leprosy, Tuberculosis, Urinary tract infections **Sexually transmitted diseases:** AIDS, Syphilis, Gonorrhea.	

Recommended Books (Latest Editions)

1. Vinay Kumar, Abul K. Abas, Jon C. Aster; Robbins &Cotran Pathologic Basis of Disease; South Asia edition; India; Elsevier; 2014.

2. HarshMohan; Text book of Pathology; 6th edition; India; Jaypee Publications; 2010.

3. Laurence B, Bruce C, Bjorn K. ; Goodman Gilman's The Pharmacological Basis of Therapeutics; 12th edition; New York; McGraw-Hill; 2011.

4. Best, Charles Herbert 1899-1978; Taylor, Norman Burke 1885-1972; West, John B (John Burnard); Best and Taylor's Physiological basis of medical practice; 12th ed; united states;

5. William and Wilkins, Baltimore;1991 [1990 printing].

6. Nicki R. Colledge, Brian R. Walker, Stuart H. Ralston;Davidson's Principles and Practice of Medicine; 21st edition; London; ELBS/Churchill Livingstone; 2010.

7. Guyton A, John .E Hall; Textbook of Medical Physiology; 12th edition; WB Saunders Company; 2010.

8. Joseph DiPiro, Robert L. Talbert, Gary Yee, Barbara Wells, L. Michael Posey; Pharmacotherapy: A Pathophysiological Approach; 9th edition; London; McGraw-Hill Medical; 2014.

9. V. Kumar, R. S. Cotran and S. L. Robbins; Basic Pathology; 6th edition; Philadelphia; WB Saunders Company; 1997.

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

Recommended Journals

1. The Journal of Pathology. ISSN: 1096-9896 (Online)

2. The American Journal of Pathology. ISSN: 0002-9440

3. Pathology. 1465-3931 (Online)

4. International Journal of Physiology, Pathophysiology and Pharmacology. ISSN: 1944-8171 (Online)

5. Indian Journal of Pathology and Microbiology. ISSN-0377-4929.

LESSON PLAN			
S. No	**Topic**	**No. of hours**	**Name of the faculty**
Unit I	**Basic principles of Cell injury and Adaptation:** Introduction, definitions, Homeostasis, Components and Types of Feedback systems	1	Mr.Kiran Kotade
	Causes of cellular injury**,**Pathogenesis (Cell membrane damage, Mitochondrial damage, Ribosome damage, Nuclear damage)	1	
	Morphology of cell injury – Adaptive changes (Atrophy, Hypertrophy, hyperplasia, Metaplasia, Dysplasia)	1	
	Cell swelling, Intra cellular accumulation, Calcification	1	
	Enzyme leakage and Cell Death Acidosis & Alkalosis, Electrolyte imbalance	1	
	Basic mechanism involved in the process of inflammation and repair: Introduction, Clinical signs of inflammation, Different types of Inflammation	1	
	Mechanism of Inflammation	1	
	Alteration in vascular permeability and blood flow, migration of WBC's, Mediators of inflammation	1	
	Basic principles of wound healing in the Skin	1	
	Pathophysiology of Atherosclerosis	1	
Unit II	**Cardiovascular System:** Pathogenesis of hypertension	1	Mr. Kiran Kotade
	Congestive heart failure	1	
	Pathophysiology of angina	1	
	Pathophysiology of myocardial infarction	1	
	Pathophysiology of atherosclerosis	1	
	Pathophysiology of arteriosclerosis	1	
	Respiratory system: Pathophysiology of asthma	1	

	Pathophysiology of chronic obstructive airway diseases	1	
	Renal system: Pathophysiology of **acute renal failure**	1	
	Pathophysiology of chronic renal failure	1	
Unit III	**Haematological diseases;** Iron deficiency, megaloblastic anemia (Vit B12 and folic acid)	1	Mr. Kiran Kotade
	sickle cell anemia, thalasemia	1	
	hereditary acquired anemia, hemophilia	1	
	Endocrine system: Diabetes, thyroid diseases,	1	
	Disorders of sex hormones	1	
	Nervous system: Epilepsy, Parkinson's disease	1	
	stroke, psychiatric disorders	1	
	depression, schizophrenia	1	
	Pathophysiology of Alzheimer's disease	1	
	Gastrointestinal system: Peptic Ulcer	1	
Unit IV	Inflammatory bowel diseases, jaundice	1	Mr. Kiran Kotade
	hepatitis (A,B,C,D,E,F) alcoholic liver diseases	1	
	alcoholic liver diseases	1	
	Disease of bones and joints: Rheumatoid arthritis	1	
	Pathophysiology of osteoporosis	1	
	Pathophysiology of gout	1	
	Principles of cancer: classification, etiology	1	
	Pathogenesis of cancer	1	
Unit V	**Infectious diseases:** Meningitis	1	Mr. Kiran Kotade
	Typhoid,	1	
	Leprosy,	1	
	Tuberculosis	1	
	Urinary tract infections	1	
	Sexually transmitted diseases: AIDS	1	
	Sexually transmitted diseases: Syphilis, Gonorrhea	1	
TOTAL NUMBER OF HOURS		**45**	1

QUESTION BANK

1) Describe homeostasis and its significance in detail.
2) Discuss in detail the pathogenesis of cell injury.
3) Explain about calcification with its types and causes.
4) Write a note on electrolyte imbalance.
5) Compare and contrast acute and chronic inflammation.
6) Explain in detail the mechanism involved in the process of inflammation.
7) Write a note on inflammatory mediators.
8) Describe the process of wound healing.
9) Give in detail the pathophysiology of atherosclerosis.
10) Discuss in detail the pathogenesis of hypertension.
11) Explain in detail the etiological factors for the cause of hypertension.
12) Write a note on CHF.
13) Give the pathogenesis of IHD.
14) Give the types of angina.
15) Explain the causes and pathophysiology of arteriosclerosis.
16) What is asthma? Discuss in detail the pathophysiology of asthma.
17) Write a note on i. bronchitis ii. Emphysema.
18) Discuss in detail kidney failure.
19) What is anaemia and give its types?
20) Explain in detail sickle cell anaemia.
21) Write a note on haemophilia.
22) Discuss in detail the pathogenesis of diabetes mellitus.
23) Explain hypothyroidism and hyperthyroidism.
24) Write a note on Graves disease.
25) Discuss in detail about goiter.
26) Explain in detail the disorders of male sex hormones.
27) Discuss in detail the pathogenesis of epilepsy.
28) Give the pathophysiology of parkinson's disease.
29) Describe depression along with its types.
30) Discuss in detail the pathogenesis of alzheimers disease.
31) Discuss in detail the pathogenesis of peptic ulcer.
32) Write a note on IBD.

33) Discuss in detail the pathogenesis of Jaundice.

34) Give the pathophysiology of hepatitis alongwith its types.

35) Write a note on rheumatoid arthritis.

36) Explain in detail about chronic gout.

37) Write a note on osteoporosis.

38) Give the pathophysiology of cancer.

39) Discuss in detail the pathogenesis of meningitis.

40) Discuss in detail the pathogenesis of tuberculosis alongwith its treatment.

41) Write a note on UTI.

42) Discuss in detail the pathogenesis of AIDS.

Subject V

COMPUTER APPLICATIONS IN PHARMACY

Scheme

Course of study

Course Code	Course Name	Lectures Assigned			
		Theory	Practical	Tutorial	Total
BP205T	Computer Applications In Pharmacy	03	-	-	03
BP210P	Computer Applications In Pharmacy	-	02	-	01

Schemes for internal assessments and end semester examinations

Course Code	Course Name	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams					
			Marks	Duration	Total	Marks	Duration	
BP205T	Computer Applications In Pharmacy	10	15	1 Hrs	25	50	2 Hrs	75
BP210P	Computer Applications In Pharmacy	5	5	2 Hrs	10	15	2 Hrs	25

BP205T. COMPUTER APPLICATIONS IN PHARMACY

(Theory)

30 Hours

Scope:

This subject deals with the introduction Database, Database Management system, computer application in clinical studies and use of databases.

Course Delivery:

The course will be delivered through lectures, class room interaction, and presentations.

Course Objectives:

Upon completion of the course the student shall be able to

- know the various types of application of computers in pharmacy
- know the various types of databases
- know the various applications of databases in pharmacy

COURSE CONTENT	
UNIT-I	**06 Hours**
Number system: Binary number system, Decimal number system, Octal number system, Hexadecimal number systems, conversion decimal to binary, binary to decimal, octal to binary etc, binary addition, binary subtraction – One's complement ,Two's complement method, binary multiplication, binary division **Concept of Information Systems and Software : I**nformation gathering, requirement and feasibility analysis, data flow diagrams, process specifications, input/output design, process life cycle, planning and managing the project	
UNIT-II	**06 Hours**
Web technologies: Introduction to HTML, XML,CSS and Programming languages, introduction to web servers and Server Products Introduction to databases, MYSQL, MS ACCESS, Pharmacy Drug database	
UNIT-III	**06 Hours**
Application of computers in Pharmacy: Drug information storage and retrieval, Pharmacokinetics, Mathematical model in Drug design, Hospital and Clinical Pharmacy, Electronic Prescribing and discharge (EP) systems, barcode medicine identification and automated dispensing of drugs, mobile technology and adherence monitoring **Diagnostic System**, Lab-diagnostic System, Patient Monitoring System, Pharma Information System	
UNIT-IV	**06 Hours**
Bioinformatics: Introduction, Objective of Bioinformatics, Bioinformatics Databases, Concept of Bioinformatics, Impact of Bioinformatics in Vaccine Discovery	
UNIT-V	**06 Hours**
Computers as data analysis in Preclinical development: Chromatographic dada analysis(CDS), Laboratory Information management System (LIMS) and Text Information Management System(TIMS)	

Recommended Books: (Latest Editions)

1. Computer Application in Pharmacy – William E.Fassett –Lea and Febiger, 600 South Washington Square, USA, (215) 922-1330.

2. Computer Application in Pharmaceutical Research and Development –Sean Ekins – Wiley-Interscience, A John Willey and Sons, INC., Publication, USA

3. Bioinformatics (Concept, Skills and Applications) – S.C.Rastogi-CBS Publishers and Distributors, 4596/1- A, 11 Darya Gani, New Delhi – 110 002(INDIA)

4. Microsoft office Access - 2003, Application Development Using VBA, SQL Server, DAP and Infopath – Cary N.Prague – Wiley Dreamtech India (P) Ltd., 4435/7, Ansari Road, Daryagani, New Delhi – 110002

LESSON PLAN			
Sr. No	**Topic**	**No. of hours**	**Name of the faculty**
Unit I	**Number system**: Binary number system, Decimal number system, Octal number system, Hexadecimal number systems,	1	Mr.Mayur Gaikar
	Conversion decimal to binary, binary to decimal, octal to binary etc, binary addition,	1	
	Binary subtraction – One's complement ,Two's complement method, binary multiplication, binary division	1	
	Concept of Information Systems and Software : Information gathering, requirement and feasibility analysis	1	
	data flow diagrams, process specifications, input/output design, process life cycle,	1	
	planning and managing the project	1	
Unit II	**Web technologies**: Introduction to HTML	1	Mr.Mayur Gaikar
	XML,CSS and Programming languages	1	
	introduction to web servers and Server Products	1	
	Introduction to databases	1	
	MYSQL, MS ACCESS	1	
	Pharmacy Drug database	1	
Unit III	**Application of computers in Pharmacy** – Drug information storage and retrieval, Pharmacokinetics,	1	Mr.Mayur Gaikar
	Mathematical model in Drug design, Hospital and Clinical Pharmacy, Electronic Prescribing and discharge (EP) systems	1	
	barcode medicine identification and automate dispensing of drugs, mobile technology and adherence monitoring	1	
	Diagnostic System, Lab-diagnostic System,	1	
	Patient Monitoring System	1	
	Pharma Information System	1	
Unit	**Bioinformatics:** Introduction,	1	Mr.Mayur Gaikar

IV	Objective of Bioinformatics	1	
	Bioinformatics Databases,	1	
	Concept of Bioinformatics	1	
	Impact of Bioinformatics in Vaccine Discovery	1	
	Impact of Bioinformatics in Vaccine Discovery	1	
Unit V	**Computers as data analysis in Preclinical development**	1	Mr.Mayur Gaikar
	Chromatographic dada analysis(CDS),	1	
	Laboratory Information management System (LIMS)	1	
	Laboratory Information management System (LIMS)	1	
	Text Information Management System(TIMS)	1	
	Text Information Management System(TIMS)	1	
TOTAL NUMBER OF HOURS		**30**	**1**

QUESTION BANK

1) Describe Binary number system?
2) Discuss in detail the Decimal number system.
3) Explain about Octal number system.
4) Write a note on Hexadecimal number systems
5) Compare and contrast conversion decimal to binary, binary to decimal, octal to binary etc?
6) Explain in detail Two's complement method & binary multiplication
7) Write a note on **I**nformation gathering.
8) Describe the process of data flow diagrams
9) Give in detail the planning and managing the project.
10) Explain the concept of HTML, XML?
11) Write a note on MYSQL.
12) Give the function of MS ACCESS & Pharmacy Drug database.
13) Give the applications of Drug information storage and retrieval.
14) Explain the Mathematical model in Drug design.
15) What is Electronic Prescribing and discharge (EP) systems.
16) Write a note on barcode medicine identification and automated dispensing of drugs
17) Discuss in detail mobile technology and adherence monitoring.
18) What is Diagnostic System and give its types?
19) Explain in detail Lab-diagnostic System & Patient Monitoring System.
20) Write a note on Pharma Information System.
21) Discuss in detail the Concept of Bioinformatics.
22) Explain Bioinformatics Databases.
23) Write a note on Impact of Bioinformatics in Vaccine Discovery.
24) Discuss in detail about Chromatographic dada analysis(CDS).
25) Explain in detail the Laboratory Information management System (LIMS).
26) Discuss in detail the Text Information Management System(TIMS).

EXPERIMENT PLAN	
DEPARTMENT: PHARMACEUTICS	
SUBJECT NAME: COMPUTER APPLICATIONS IN PHARMACY	
SUBJECT CODE: BP210P	
NOS. OF PRACTICAL: 12	**LAB. NO.**
TEACHERS IN-CHARGE: Mr. MAYUR GAIKAR	

Sr. No.	Experiment Title	References	Materials per Batch		Glassware		Instrument equipment with numbers
			Name	Qty	Name	Qty	
1	Design a questionnaire using a word processing package to gather information about a particular disease.		-	-	-	-	Computer
2	Create a HTML web page to show personal information		-	-	-	-	Computer
3	Retrieve the information of a drug and its adverse effects using online tools		-	-	-	-	Computer
4	Creating mailing labels Using Label Wizard , generating label in MS WORD		-	-	-	-	Computer
5	Create a database in MS Access to store the patient information with the required		-	-	-	-	Computer

	fields Using access						
6	Design a form in MS Access to view, add, delete and modify the patient record in the database		-	-	-	-	Computer
7	Generating report and printing the report from patient database		-	-	-	-	Computer
8	Creating invoice table using – MS Access		-	-	-	-	Computer
9	Drug information storage and retrieval using MS Access		-	-	-	-	Computer
10	Creating and working with queries in MS Access		-	-	-	-	Computer
11	Exporting Tables, Queries, Forms and Reports to web pages		-	-	-	-	Computer
12	Exporting Tables, Queries, Forms and Reports to XML pages		-	-	-	-	Computer

Subject VI

ENVIRONMENTAL SCIENCES

(EVS)

Scheme

Course of study

Course Code	Course Name	Lectures Assigned			
		Theory	Practical	Tutorial	Total
BP206T	EVS	02	-	-	02

Schemes for internal assessments and end semester examinations

Course Code	Course Name	Internal Assessment				End Semester Exams		Total Marks
			Sessional Exams					
		Continuous Mode	Marks	Duration	Total	Marks	Duration	
BP206T	EVS	5	10	1 Hrs	15	35	1.5 Hrs	50

BP206T. ENVIRONMENTAL SCIENCES

(Theory)

30 Hours

Scope:

Environmental Sciences is the scientific study of the environmental system and the status of its inherent or induced changes on organisms. It includes not only the study of physical and biological characters of the environment but also the social and cultural factors and the impact of man on environment.

Course Delivery:

The course will be delivered through lectures, class room interaction, and presentations.

Course Objectives:

Upon completion of the course the student shall be able to

- Create the awareness about environmental problems among learners.
- Impart basic knowledge about the environment and its allied problems.
- Develop an attitude of concern for the environment.
- Motivate learner to participate in environment protection and environment improvement.
- Acquire skills to help the concerned individuals in identifying and solving environmental problems.
- Strive to attain harmony with Nature.

COURSE CONTENT	
UNIT-I	**10 Hours**
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	**10 Hours**
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-III	**10 Hours**
Environmental Pollution: Air pollution; Water pollution; Soil pollution	
Recommended Books: 1. Y.K. Sing, Environmental Science, New Age International Pvt, Publishers, Bangalore 2. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner. 3. Bharucha Erach, The Biodiversity of India, Mapin Pu blishing Pvt. Ltd., Ahmedabad – 380 013, India, 4. Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p 5. Clark R.S., Marine Pollution, Clanderson Press Oxford 6. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p 7. De A.K., Environmental Chemistry, Wiley Eastern Ltd. 8. Down of Earth, Centre for Science and Environment	

LESSON PLAN			
Sr. No	**Topic**	**No. of hours**	**Name of the faculty**
Unit I	The Multidisciplinary nature of environmental studies: Natural Resources	1	Ms. K.T.Vaditake
	Renewable and non-renewable resources	1	
	Natural resources and associated problems	1	
	Forest resources	1	
	Water resources	1	
	Mineral resources	1	
	Food resources	1	
	Energy resources	1	
	Land resources: Role of an individual in conservation of natural resources	2	
Unit II	Ecosystems: Concept of an ecosystem, Introduction,	1	Ms. K.T.Vaditake
	Structure and function of an ecosystem,	1	
	Types, characteristic features,	2	
	Ecosystems	1	
	Forest ecosystem	1	
	Grassland ecosystem	1	
	Desert	1	
	Ecosystem; Aquatic ecosystems ponds	1	
	Streams, lakes, rivers,	1	
	oceans, estuaries	1	
Unit III	Environmental Pollution	2	Ms. K.T.Vaditake
	Air pollution	3	
	Water pollution	2	
	Soil pollution	2	
TOTAL		**30**	**1**

QUESTION BANK

1. Write a note multidisciplinary nature of environmental science.
2. Explain renewable and non-renewable sources.
3. Case study on problem associated with water, mineral and forest resources and energy resources.
4. What is the ecosystem? Explain different ecosystem.
5. Write the structure and function of ecosysytem.
6. Explain Aquatic ecosystem in detail with structure and functions.
7. Write a note and case study of
    a) Water Pollution
    b) Air Pollution
    c) Soil Pollution.
8. Study of any nature spot.
9. Report writing on nature visit.
10. Factors affecting on environment.

CONTACT DETAILS

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