SHRI SHANKARACHARYA TECHNICAL CAMPUS
SHRI SHANKARACHARYA GROUP OF INSTITUTION
Faculty of Pharmaceutical Sciences
(An Autonomous Institution)
SCHEME OF TEACHING AND EXAMINATION (Effective from 2020 – 2021 Batch)
Courses of Study and Scheme of Examination of Pharmacy
Bachelor in Pharmacy (First Semester)

Sl. No.	Board of Studies (BOS)	Course Code	Courses	Internal Assessment				End Semester Exams		Total Marks	Credit
				TA	Sessional		Total	Marks	Duration		
					CA	Duratio					
1.	Pharmacy	PH108101	Human Anatomy and Physiology –I– Theory(BP101T)	10	15	1 Hr	25	75	3 Hrs	100	4
2.	Pharmacy	PH108102	Pharmaceutical Analysis –I – Theory (BP102T)	10	15	1 Hr	25	75	3 Hrs	100	4
3.	Pharmacy	PH108103	Pharmaceutics –I – Theory (BP103T)	10	15	1 Hr	25	75	3 Hrs	100	4
4.	Pharmacy	PH108104	Pharmaceutical Inorganic Chemistry – Theory (BP104T)	10	15	1 Hr	25	75	3 Hrs	100	4
5.	Pharmacy	PH108105	Communication skills – Theory * (BP105T)	5	10	1 Hr	15	35	1.5 Hrs	50	2
6.	Pharmacy	Refer Table - I	**Open Elective – I***	**5**	10	1 Hr	**15**	35	1.5 Hrs	50	2
7.	Pharmacy	PH108191	Human Anatomy and Physiology – I Practical(BP107P)	5	10	4 Hrs	15	35	4 Hrs	50	2
8.	Pharmacy	PH108192	Pharmaceutical Analysis –I – Practical (BP108P)	5	10	4 Hrs	15	35	4 Hrs	50	2
9.	Pharmacy	PH108193	Pharmaceutics –I – Practical (BP109P)	5	10	4 Hrs	15	35	4 Hrs	50	2
10.	Pharmacy	PH108194	Pharmaceutical Inorganic Chemistry – Practical (BP110P)	5	10	4 Hrs	15	35	4 Hrs	50	2
11.	Pharmacy	PH108195	Communication skills – Practical* (BP111P)	5	5	2 Hrs	10	15	2 Hrs	25	1
12.	Pharmacy	PH108196	Remedial Biology – Practical* (BP112RBP)	5	5	2 Hrs	10	15	2 Hrs	25	1
				70/75 $/80#	**115/ 125$ /130**	**23/24$/26# Hrs**	**185/200 $/210#**	**490/525 $/54#**	**5/33$/3 #**	**675/725$ /750#**	**30**

L-Lecture T-Tutorial P-Practical
CT-Class Test TA-Teachers Assessment ESE-End Semester Exam

Table-I
Open Elective-I

S. No	Board of Study	Subject Code	Name of the course with PCI code Non university exam (NuE)
1	Pharmacy	**PH108141**	Remedial Biology– Theory*(BP106RBT)
2	Pharmacy	**PH108142**	Remedial Mathematics – Theory* (BP106RMT)

Applicable ONLY for the students who have studied Mathematics / Physics / Chemistry at HSC and appearing for Remedial Biology (RB) course.
$ Applicable ONLY for the students who have studied Physics / Chemistry / Botany / Zoology at HSC and appearing for Remedial Mathematics (RM) course.
***Non university exam (NuE) – as per PCI - The subject experts at college level shall conduct examinations**

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Bachelor in Pharmacy (Second Semester)

Sl. No.	Board of Studies (BOS)	Course Code	Courses	Internal Assessment				End Semester Exams		Total Marks	Credit
				TA	Sessional Exam		Total	Marks	Duration		
					CA	Duration					
1.	Pharmacy	PH108201	Human Anatomy and Physiology –II – Theory (BP201T)	10	15	1 Hr	25	75	3 Hrs	100	4
2.	Pharmacy	PH108202	Pharmaceutical Organic Chemistry –I – Theory (P202T)	10	15	1 Hr	25	75	3 Hrs	100	4
3.	Pharmacy	PH108203	Biochemistry – Theory (BP203T)	10	15	1 Hr	25	75	3 Hrs	100	4
4.	Pharmacy	PH108204	Computer Applications in Pharmacy – Theory* (BP205T)	10	15	1 Hr	25	50	2 Hrs	75	3
5.	Pharmacy	PH108205	Environmental sciences – Theory* (BP206T)	10	15	1 Hr	15	50	2 Hrs	75	3
6.	Pharmacy	PH108291	Human Anatomy and Physiology –II – Practical (BP207P)	**5**	10	4 Hrs	15	35	4 Hrs	50	2
7.	Pharmacy	PH108292	Pharmaceutical Organic Chemistry –I– Practical (BP208P)	5	10	4 Hrs	15	35	4 Hrs	50	2
8.	Pharmacy	PH108293	Biochemistry – Practical (BP209P)	5	10	4 Hrs	15	35	4 Hrs	50	2
9.	Pharmacy	PH108294	Computer Applications in Pharmacy – Practical* (BP210P)	5	5	2 Hrs	10	15	2 Hrs	25	1
Total				**70**	**110**	**19 Hrs**	**180**	**445**	**27 Hrs**	**625**	**25**

L-Lecture T-Tutorial P-Practical
CT-Class Test TA-Teachers Assessment ESE-End Semester Exam

***Non university exam (NuE) – as per PCI - The subject experts at college level shall conduct examinations**

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SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108101	Human Anatomy and Physiology – I – Theory(BP101T)	L=3	T =1	P =	Credits= 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	75	15	10	100	3 Hours

CourseObjectives	CourseOutcomes
Upon completion of this course the student should be able to: • Explain the gross morphology, structure and functions of various organs of the human body. • Describe the various homeostatic mechanisms and their imbalances. • Identify the various tissues and organs of different systems of human body. • Perform the various experiments related to special senses and nervous system. • Appreciate coordinated working pattern of different organs of each system	On successful completion of the course, the student will be able to: **CO1:-** Explain the relevance and significance of Human Anatomy and Physiology **CO2:-** Interpret the basic terminologies used in anatomy and physiology as well as prefixes & suffixes used to identify body parts and directional terms. **CO3:-** Identify the various tissues and organs of different system of human body **CO4:-** Describe the various homeostatic mechanisms and their imbalances

UNIT– I : **CO1**

- **Introduction to humanbody**

Definition and scopeof anatomy and physiology, levels ofthestructural organization and body systems, basic life processes, homeostasis, basic anatomical terminology.

- **Cellular level oforganization**

Structure and functions of the cell, transport across cell membrane, cell division, cell junctions. General principles of cell communication, intracellular signaling pathway activation by extra cellular signal molecule, Forms of intracellular signaling: a) Contact - dependent b) Paracrine c) Synaptic d) Endocrine

- **Tissue level oforganization**

Classification of tissues, Structure, location and function of epithelial, muscular and nervous and connective tissues. **10 Hours**

UNIT-II : **CO2**

- **Integumentary system** Structure and functions ofskin
- **Skeletalsystem-** Divisions of skeletal system, types of bone, salient features and functions of bones of axial appendicle skeletal system, Organization of skeletal muscle, physiology of muscle contraction, neuromuscular junction. **10 hours**

UNIT- III: **CO3**

- **Nervoussystem**

  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 ofbrain (cerebrum, brain stem, cerebellum), spinal cord (gross structure, functions of afferent and efferent nerve tracts, reflex activity) **10 hours**

UNIT-IV : **CO4**

Peripheral nervous system:- Classification of the peripheral nervous system: Structure and function of sympathetic and parasympathetic nervous system. Origin and function of spinal and cranial nerves.

Specialsenses - Structure and functions of eye, ear, nose and tongue and their disorders**.** **8 hours**

UNIT-V : **CO5**

- **Endocrinesystem**

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

  7 hours

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SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108191	Human Anatomy and Physiology –I– Practical(BP107P)	L =	T =	P = 4	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	35	10	5	50	3 Hrs

List of Experiments

- Study of compoundmicroscope.
- Microscopic study of epithelial and connectivetissue
- Microscopic study of muscular and nervoustissue
- Identification of axialbones
- Identification of appendicularbones
- To study the integumentary and special senses using specimen, models,etc.,
- To study the nervous system using specimen, models,etc.,
- To study the endocrine system using specimen, models, etc.
- To demonstrate the general neurologicalexamination
- To demonstrate the function of olfactorynerve
- To examine the different types oftaste.
- To demonstrate the visual acuity
- To demonstrate the reflex activity
- Recording of bodytemperature
- To demonstrate positive and negative feedbackmechanism.

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Essentials of Medical Physiology	K. Sembulingam and P. Sembulingam	Six	Jaypeebrothers medical publishers, New Delhi.
2	Physiological basis of Medical Practice	Best and Taylor	Thirteenth	Williams & Wilkins Co, Riverview, MI USA
3	Textbook of anatomy & physiology	Patton, Thibeau	Fifteenth	Elsevier

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ReferenceBooks:

S. No.	Title	Authors	Edition	Publisher
1	Text book of Medical Physiology	Arthur C, Guyton and John.E. Hall	Eleventh	Miamisburg, OH, U.S.A
2	Principles of Anatomy and Physiology	Tortora Grabowski	Fifth	Eastern press
3	Anatomy and Physiology in Health and Illness	Kathleen J.W. Wilson	Eleventh	Churchill Livingstone, New York

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SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108102	Pharmaceutical Analysis–I–Theory (BP102T)	L= 3	T = 1	P =	Credits= 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	75	15	10	100	3 Hours

CourseObjectives	CourseOutcomes
At completion of this course it is expected that students will be able to understand- Apply different analytical techniques to analyse drug sample.	On successful completion of the course, the student will be able to: **CO1-** Memorize all fundamentals of quantitative chemical analysis. **CO2 -** Apply analytical techniques to analyse drugs by formation of slightly soluble salt, metal ions complex and by weight measurement. **CO3:-** Apply analytical techniques to analyse drugs through redox reaction. **CO4:-** Apply analytical techniques to analyse drugs through instrumental methods

UNIT-I: **CO1**

(a) Pharmaceutical analysis- Definition andscope

i) Different techniques of analysis

ii) Methods of expressing concentration

iii) Primary and secondary standards.

iv) Preparation and standardization of various molar and normal solutions- Oxalic acid, sodium hydroxide, hydrochloric acid, sodium thiosulphate, sulphuric acid, potassium permanganate and ceric ammoniumsulphate

(b) Errors: Sources of errors , types of errors, mathods of minimizing errors,accuracy, precision and significant figures. **10 Hours**

UNIT-II: **CO2**

- **Acid based titration:** Theories of acid base indicators, classification of acid base titrations and theory involved in titrations of strong, weak, and very weak acids and bases, neutralization curves
- **Nonaqueous titration:** Solvents, acidimetry and alkalimetry titration andestimation of Sodium benzoate and Ephedrine HCl. **10 Hours**

UNIT-III : **CO3**

- **Precipitation titrations:Mohr's method, Volhard's, Modified**
- **Complexometric titration:** Classification, metal ionindicators, maskinganddemasking reagents, estimation of Magnesium sulphate, and calcium gluconate.
- **Gravimetry** : Principle and steps involved in gravimetric analysis.Purity of the precipitate: co-precipitation and post precipitation, Estimation of bariumsulphate. **10 Hours**

UNIT-IV : **CO4**

Redox titrations

(a) Concepts of oxidation andreduction

(b) Types of redox titrations (Principles andapplications)

Cerimetry, Iodimetry, Iodometry, Bromatometry, Dichrometry, Titration with potassium iodate **8 Hours**

UNIT- V : **CO5**

- **Electrochemical methods ofanalysis**
- **Conductometry**- Introduction, Conductivity cell, Conductometrictitrations,applications.
- **Potentiometry -** Electrochemical cell, construction andworkingof reference (Standard hydrogen, silver chloride electrode and calomel electrode) and indicator electrodes (metal electrodes and glass electrode), methods to determine end point of potentiometric titration and applications.
- **Polarography -** Principle, Ilkovicequation, construction andworking of dropping mercury electrode and rotating platinum electrode, applications. **7 Hours**

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SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108192	Pharmaceutical Analysis – I –Practical (BP108P)	L =	T =	P =4	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	35	10	5	50	3 Hrs

List of Experiments

- **Preparation and standardizationof**
  - Sodiumhydroxide
  - Sulphuricacid
  - Sodiumthiosulfate
  - Potassiumpermanganate
  - Ceric ammoniumsulphate
- **Assay of the following compounds along with Standardization ofTitrant**
  - Ammonium chloride by acid basetitration
  - Ferrous sulphate byCerimetry
  - Copper sulphate byIodometry
  - Calcium gluconate bycomplexometry
  - Hydrogen peroxide byPermanganometry
  - Sodium benzoate by non-aqueous titration
  - Sodium Chloride by precipitationtitration
- **Determination of Normality by electro-analyticalmethods**
  - Conductometric titration of strong acid against strongbase
  - Conductometric titration of strong acid and weak acid against strongbase
  - Potentiometric titration of strong acid against strongbase

TextBooks:

S. No.	Title	Authors	Edition	Publisher
1	Analytical Chemistry Theory and Practice	R. M. Verma	Seventh	C.B.S. Publications.
2	Pharmaceutical Analysis, Vol-I	Dr. A.V. Kasture	Fourth	Nirali Publication
3	Practical Pharmaceutical Analysis	Dr. G. DevalaRao	Fourth	Birla Publication

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ReferenceBooks:

S. No.	Title	Authors	Edition	Publisher
1	Text Book of Quantitative Inorganic analysis	A.I. Vogel,	7th	PEARSON INDIA
2	Organic synthesis-the disconnection approach, Wily India	S. Warren	Second	Wiley

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SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108103	Pharmaceutics – I – Theory (BP103T)	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	75	15	10	100	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Upon completion of this course the student should be able to: Know the history of profession of pharmacy. • Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations • Understand the professional way of handling the prescription Preparation and evaluation of various conventional dosage forms	**On successful completion of the course, the student will be able to:** **CO1:-List** the major milestones in the history of profession of pharmacy and their relation with dosage forms**(Blooms level 1)** **CO2:-Memorise** after understanding the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations **(Blooms level 1**) **CO3:-Defining** and handling the prescription with different dosage forms**(Blooms level 1)** **CO4:-Duplicating** various conventional dosage forms in practical sessions**(Blooms level 1**)

UNIT-I : **CO1**

- **Historical background and development of theprofession of pharmacy**: History of theprofession of Pharmacy in India in relation to pharmacy education, industry and organization, Pharmacy as a career, Pharmacopoeias: Introduction to IP, BP, USP and ExtraPharmacopoeia.
- **Dosage forms:** Introduction to dosage forms, classification anddefinitions
- **Prescription:**Definition, parts of prescription, handling ofPrescription and Errors in Prescription.
- **Posology:**Definition, Factors affecting posology. Paediatric dose calculations based on age, body weight and body surface area. **10 Hours**

UNIT-II : **CO2**

- **Pharmaceutical calculations:** Weights and measures–Imperial & Metric system, Calculations involving percentage solutions, allegation, proof spirit and isotonic solutions based on freezing point and molecular weight.
- **Powders :** Definition, classification, advantagesand disadvantages, Simple& compound powders - official preparations, dusting powders, effervescent, efflorescent and hygroscopic powders, eutectic mixtures. Geometric dilutions.
- **Liquiddosage forms:** Advantages and disadvantages of liquid dosage forms. Excipients used in formulation of liquid dosage forms. Solubility enhancement techniques. **10 Hours**

UNIT-III : **CO3**

- **Monophasic liquids:** Definitions and preparations 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, emulsifyingagent, testfortheidentificationof thetypeofemulsion, Methods of preparation& stability problems and methods to overcome.

8 Hours

UNIT-IV : **CO4**

- **Suppositories**: Definition, types, advantages and disadvantages, types of bases, methods of preparations. Displacement value & its calculations, evaluation of suppositories.
- **Pharmaceutical incompatibilities**: Definition, classification, physical, chemicaland therapeutic incompatibilities with examples. **8 Hours**

UNIT-V : **CO5**

- **Semisolid dosage forms: Definitions**, classification, mechanisms and factors influencing dermal penetration of drugs. Preparation of ointments, pastes, creams and gels. Excipients used in semi-solid dosage forms. Evaluation of semi-solid dosages forms. **7 Hours**

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SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108193	Pharmaceutics – I – Practical (BP109P)	L =	T =	P = 4	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	35	10	2	50	3 Hrs

List of Experiments

1. **Syrups -** a)SyrupIP b) Paracetamolpaediatricsyrup
2. **Elixirs -** a) Piperazine citrateelixir b) Paracetamolpaediatricelixir
3. **Linctus** a) Simple LinctusBPC
4. **Solutions**

- Strong solution of ammoniumacetate
- Cresol with soapsolution

a) Suspensions- Calaminelotion, Magnesium Hydroxidemixture

b) Emulsions - a) TurpentineLiniment b) Liquid paraffinemulsion

c) Powders andGranules

a) ORS powder(WHO) b)Effervescentgranules c) Dustingpowder

b) **Suppositories-** a) Glycero gelatine suppository b) Soap glycerine suppository

B) **Semisolids – a)** Sulphurointment b) Non staining iodine ointment with methylsalicylate c) Bentonite gel

C) Gargles andMouthwashes

a) Potassium chlorategargle b) Chlorhexidine mouth wash

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Aulton's Pharmaceutics: The Design and Manufacture of Medicines	Michael E. Aulton	3 rd Edition	Churchill Livingstone, London
2	Pharmaceutics - I	R. M. Mehta	3 rd Edition	Vallabh Prakashan
3	Introduction to Pharmaceutics: Theory & Practice	DK Tripathi	I st Edition	Jaypee Digital Jaypee

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Martin's Physical Pharmacy and Pharmaceutical Sciences	Patrick J. Sinko	6th Edition	Wolters Kluwer
2	Bentley's Textbook of Pharmaceutics	Sanjay Jain		Elsevier
3	Remington - Essentials of Pharmaceutics Remington education	Linda A. Felton	Ist Edition	Pharmaceutical Press

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Subject Code PH108104	Pharmaceutical Inorganic Chemistry–Theory (BP104T)	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	75	15	10	100	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
At completion of this course it is expected that students will be able to understand-,know the sources of impurities and methods to determine the impurities in inorganic drugs, pharmaceuticals and understand the medicinal and pharmaceutical importance of inorganic compounds.	On successful completion of the course, the student will be able to: **CO1 -** List the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals **CO2 -** Discuss about the classification of inorganic compounds used as medicinal and pharmaceutical purposes **CO3**- Understand the preparation , properties and uses of different inorganic compounds **CO4**- Apply the assay method for the different inorganic compounds to conform the purity

UNIT-I : **CO1**

Impurities inpharmaceutical substances: History of Pharmacopoeia, Sources and types of impurities, principle involved in the limit test for Chloride, Sulphate, Iron, Arsenic, Lead and Heavy metals , modified limit test for Chloride and Sulphate

General methods of preparation, assay for the compounds superscripted with **asterisk** (*), properties and medicinal uses of inorganic compounds belonging to the following classes **10 Hours**

UNIT-II : **CO2**

- **Acids, Bases and Buffers:** Bufferequations and buffer capacity in general, buffers in pharmaceutical systems, preparation, stability, buffered isotonic solutions, measurements of tonicity, calculations and methodsof adjusting is tonicity.
- **Major extra and intracellular electrolytes:** Function of major physiological ions, Electrolytes used in the replacement therapy: Sodium chloride*, Potassium chloride, Calcium gluconate* and Oral Rehydration Salt (ORS), Physiological acid-base balance.

Dental products: Dentifrices, the role of fluoride in the treatment of dental care's, Desensitizing agents, Calcium carbonate, Sodium fluoride, and Zinc eugenol cement. **10 Hours**

UNIT- III : **CO3**

- **Gastrointestinal agents**

Acidifiers: Ammonium chloride* and Dil. HCl

Antacid: Ideal properties of antacids, combinations of antacids, Sodium Bicarbonate*, Aluminum hydroxide gel, Magnesium hydroxide mixture

Cathartics: Magnesium sulphate, Sodium orthophosphate, Kaolin and bentonite

Antimicrobials: Mechanism, classification, Potassium permanganate, Boricacid, Hydrogen peroxide*, Chlorinated lime*, Iodine and its preparations. **10 Hours**

UNIT-IV : **CO4**

- **Miscellaneous compounds**

Expectorants: Potassium iodide, Ammonium chloride*.

Emetics: Copper sulphate*, Sodium potassium tartarate

Haematinics: Ferrous sulphate*, Ferrous gluconate

Poison and Antidote: Sodium thiosulphate*, Activated charcoal, Sodiumnitrite333

Astringents: Zinc Sulphate, Potash Alum **8 Hours**

UNIT –V : **CO5**

Radiopharmaceuticals: Radio activity, Measurement of radioactivity,Properties of α, β, γ radiations, Half-life, radio isotopes and study of radio isotopes - SodiumiodideI, Storage conditions, precautions& pharmaceutical application of radioactive substances **7 Hours**

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Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108194	Pharmaceutical Inorganic Chemistry – Practical (BP110P)	L =	T =	P = 4	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	35	10	5	50	3 Hrs

List of Experiments

I Limit tests for followingions

Limit test for Chlorides and Sulphates
Modified limit test for Chlorides and Sulphates
Limit test for Iron
Limit test for Heavy metals
Limit test for Lead
Limit test for Arsenic

II Identification test

Magnesium hydroxide, Ferrous sulphate, Sodium bicarbonate, Calcium gluconate
Copper sulphate

III Test forpurity

Swelling power of Bentonite
Neutralizing capacity of aluminium hydroxide gel
Determination of potassium iodate and iodine in potassium Iodide

IVPreparation of inorganicpharmaceuticals

Boric acid, Potash alum, ferrous sulphate

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Inorganic Pharmaceutical Chemistry,	P. GunduRao,	3 rd Edition	VallabhPrakashan
2	Inorganic Pharmaceutical Chemistry	Anand& G.R. Chatwal	-	Himalaya Pub. House
3	Inorganic Pharmaceutical Chemistry	M.L Schroff	-	Calcutta : National Book Centre

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Bentley And Driver*s Textbook Of Pharmaceutical Chemistry	L.M. Atherdem	-	London, Oxford University Press
2	Indian pharmacopoeia	-	2018	

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SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108105	Communication Skills – Theory (BP105T)	L = 1	T = 1	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	35	10	5	50	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
This course has been designed to prepare the young pharmacy student to interact effectively with the medical and para-medical professionals. At the completion of this course, the student will be equipped with sufficient soft skill set to work cohesively with the team as an effective team player and prove as an asset to the pharmaceutical business.	On successful completion of the course, the student will be able to: Upon completion of the course the student shall be able to CO1- Understand the behavioural needs for a Pharmacist to function effectively in the areas of pharmaceutical operation CO2- Communicate effectively (Verbal and Non Verbal) CO3- Effectively manage the team as a team player CO4- Develop interview skills CO5- Develop Leadership qualities and essentials

UNIT – I : Key Concepts of Communication

- Communication Skills: Introduction, Definition, Importance of Communication, The Communication Process.
- Barriers to communication: Physiological Barriers ,Physical Barriers ,Cultural Barriers ,Language Barriers, Gender Barriers, Interpersonal Barriers, Psychological Barriers ,Emotional Barriers.
- Elements of Communication: Introduction, Face to Face Communication- Tone of Voice, Body Language (Non – Verbal Communication), Verbal Communication, Physical Communication. **7 Hour**

UNIT – II :

Reading and Grammar

- Comprehension Skills, Parts of Speech (Parsing), Tenses, Agreement of Subject with verb, Voices (Active & Passive), Article, Reported Speech, Phrasal Verbs, One word substitution. **7 Hours**

UNIT– III :

Writing

- Resume (Elements) and Cover Letter
- Letter Writing – Elements, Characteristics
- Business Letters –Inviting and Sending Quotations, Placing Orders, Claims & Adjustments.
- Emails – Dos and Don'ts **7 Hours**

UNIT – IV :5 Hours

Listening

- Process
- Difference between Hearing and Listening
- Effective Listening skills (Essentials and Advantages)
- Types of Listening.
- Barriers of Listening.
- Ethics of Telephonic Conversation **5 Hours**

UNIT – V:

Speaking

- Group Discussion, Interviews, Presentations. **4 Hours**

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SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108195	Communication Skills – Practical (BP111P)	L =	T =	P =2	Credits = 1
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	15	5	5	25	3 Hrs

List of Experiments

1. **Basic communication covering the following topics**
   Meeting People, Asking Questions, Making Friends, What did you do?, Do's and Dont's
2. **Pronunciations covering the following topics**
   Pronunciation (Consonant Sounds) Pronunciation and Nouns Pronunciation (Vowel Sounds)
3. **Advanced Learning**
   Listening Comprehension / Direct and Indirect Speech
   Figures of Speech
   Effective Communication
   Writing Skills
   Effective Writing
   Interview Handling Skills
   E-Mail etiquette
   Presentation Skills

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Basic communication skills for Technology	Andreja. J.Ruther Ford,	2nd Edition,	Pearson Education,2011
2	Communication skills	Sanjay Kumar, Pushpalata	1st Edition	Oxford Press, 2011
3	Organizational Behavior	Stephen .P. Robbins	1st Edition	Pearson, 2013

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Effective communication,	John Adair	4th Edition	Pan Mac Millan,2009
2	Soft skill for everyone	Butter Field,	1st Edition	Cengage Learning Indiapvt.ltd, 2011

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SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108141	Remedial Biology – Theory (BP106RBT)	L = 1	T = 1	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	35	20	30	50	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Upon completion of this course the student should be able to: • know the classification and salient features of five kingdoms of life • understand the basic components of anatomy & physiology of plant know understand the basic components of anatomy & physiology animal with special reference to human	On successful completion of the course, the student will be able to: **CO-1 -** Define and recall fundamental concept of living world and botany. (Blooms Level- I Remembering) **CO-2-** Demonstrate the scientific concepts of human anatomy related to blood circulation respiration and digestion . (Blooms Level- III Applying) **CO-3 -** Demonstrate the scientific concepts of human biology related to CNS, Excretion and harmonal regulation. (Blooms Level- III Applying) **CO-4 -** Illustrate various theories related to the plant life cycle like photosynthesis respiration. (Blooms Level- II Understanding)

UNIT-I :

Living world:

- Definition and characters of livingorganisms
- Diversity in the livingworld
- Binomialnomenclature
- Five kingdoms of life and basis of classification. Salient features of Monera, Potista, Fungi, Animalia and Plantae, Virus, **7 Hours**

Morphology of Flowering plants

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

UNIT-II :

Body fluids and circulation

- Composition of blood, blood groups, coagulation ofblood
- Composition and functions oflymph
- Human circulatorysystem
- Structure of human heart and bloodvessels
- Cardiac cycle, cardiac output andECG

Digestion and Absorption

- Human alimentary canal and digestiveglands
- Role of digestiveenzymes
- Digestion, absorption and assimilation of digestedfood

Breathing and respiration

- Human respiratorysystem
- Mechanism of breathing and itsregulation
- Exchange of gases, transport of gases and regulation ofrespiration
- Respiratory volumes **7 Hours**

UNIT-III :

Excretory products and their elimination

- Modes ofexcretion
- Human excretory system- structure andfunction
- Urineformation
- Rennin angiotensinsystem

Neural control and coordination

- Definition and classification of nervoussystem
- Structure of aneuron
- Generation and conduction of nerveimpulse
- Structure of brain and spinalcord
- Functions of cerebrum, cerebellum, hypothalamus and medullaoblongata

Chemical coordination and regulation

- Endocrine glands and theirsecretions
- Functions of hormones secreted by endocrineglands

Human reproduction

- Parts of female reproductivesystem
- Parts of male reproductivesystem
- Spermatogenesis andOogenesis
- Menstrualcycle **7 Hours**

UNIT-IV :

Plants and mineral nutrition:

- Essential mineral, macro andmicronutrients
- Nitrogen metabolism, Nitrogen cycle, biological nitrogenfixation

Photosynthesis

- Autotrophic nutrition, photosynthesis, Photosynthetic pigments, Factors affecting photosynthesis. **5 Hours**

UNIT-V :

Plant respiration: Respiration, glycolysis, fermentation (anaerobic).

Plant growth and development

- Phases and rate of plant growth, Condition of growth,Introduction to plant growth regulators

Cell - The unit of life

- Structure and functions of cell and cell organelles.Celldivision

Tissues

- Definition, types of tissues, location and functions. **04 Hours**

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Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108196	Remedial Biology – Practical (BP112RBP)	L = 0	T =0	P = 2	Credits = 1
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	15			50	3 Hrs

List of Experiments

I. Introduction to experiments in biology

A) Study ofMicroscope
B) Section cuttingtechniques
C) Mounting andstaining
D) Permanent slidepreparation

II. Study of cell and itsinclusions
III. Study of Stem, Root, Leaf and itsmodifications
IV. Detailed study of frog by using computermodels
V. Microscopic study and identification oftissues
VI. Identification ofbones
VII. Determination of blood group
VIII. Determination of bloodpressure
IX. Determination of tidalvolume

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	General Zoology	Dr. A Sehgal	3 rd Edition	Unique Publisher
2	Remedial Biology	Dr. P. K Singh	5th Edition	S. Chand
3	Remedial Biology	Dr. Vyawahare	I st Edition	Technical Publication

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Remedial Biology	S. B. Gokhle	1st Edition	Nirali Publication
2	Remedial Biology	Dr. M. K.Shrisat	1st Edition	Everest Publishing House

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SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108142	Remedial Mathematics – Theory (BP106RMT)	L = 1	T = 1	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	35	20	30	50	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
This is an introductory Course in Mathematics. This subject deals with the introduction to Partial fraction, Logarithm, matrices and Determinant, Analytical geometry, Calculus, differential equation and Laplace Transform. Upon completion of the course the student shall be able to:- • Know the theory and its applications in Pharmacy. • Solve the different types of problems by applying theory. • Analyze and appreciate the important applications of mathematics in Pharmacy. • Apply mathematical concepts and principles to perform computations for Pharmaceutical Sciences. To provide a thorough understanding of methods to solve ordinary differential equation.	On successful completion of the course, the student will be able to: **CO1-** Students would be able apply the knowledge of differential equations in the study of Pharmacy and other linear systems. **CO2-** Students will have a solid foundation of the principles of mathematics and will be able to applied that knowledge to a variety of problems. **CO3-** Students will have a composite understanding of the modular elements : matrices, differential calculus, integral calculus, partial differential, ordinary differential equation and its application to Pharmacy. **CO4-** Students can understand to identify, formulate and solve Pharmaceutical Problems by using mathematical tools. **CO5-** Apply mathematical concepts and principles to perform computations for Pharmaceutical Sciences.

UNIT – I

1. **Partial fraction**
   Introduction, Polynomial, Rational fractions, Proper and Improper fractions, Partial fraction, Resolving into Partial fraction, Application of Partial Fraction in Chemical Kinetics and Pharmacokinetics
2. **Logarithms**
   Introduction, Definition, Theorems/Properties of logarithms, Common logarithms, Characteristic and Mantissa, worked examples, application of logarithm to solve pharmaceutical problems.
3. **Function**
   Real-Valued function, Classification of real-valued functions,
4. **Limits and continuity**:**Introduction, Limit of a function, Definition of limit of a function (□ - □*x* "□*a*"**sin**□ **6 Hours**

UNIT –II

- **Matrices and Determinant:**

  Introductionmatrices, Typesofmatrices, Operation on matrices, Transpose of a matrix, Matrix Multiplication, Determinants, Properties of determinants , Product of determinants, Minors and co-Factors, Adjoin or adjugateofa square matrix , Singular and Non - Singular matrices, Inverse of a matrix, Solution of system of linear of equations using matrix method, Cramer's rule, Characteristic equation and roots of a square matrix, Cayley–Hamilton theorem,Application of Matricesinsolving Pharmacokinetic equations.

6 Hours

UNIT – III

- **Calculus**

  Differentiation : Introductions, Derivative of a function, Derivative of a constant, Derivative of a product of a constant and a function , Derivative of the sum or difference of two functions, Derivative of the product of two functions (product formula), Derivative of the quotient of two functions (Quotient formula) – **Without Proof**, Derivative of x x,where$n$isanyrationanumber, Derivativeof$e$, Derivativeof$\log_e x$, Derivativeof$a$, Derivative of trigonometric functions from first principles **(withoutproof)**, Successive Differentiation, Conditions for a function to be amaximum or a minimum at a point. Application **6 Hours**

UNIT– IV

- **Analytical Geometry**

Introduction: Signs of the Coordinates, Distance formula,

Straight Line: Slope or gradient of a straight line, Conditions forparallelism and perpendicularity of two lines, Slope of a line joining two points, Slope-intercept form of a straight line.

Integration: Introduction, Definition, Standard formulae, Rules of integration, Method of substitution, Method of Partial fractions, Integration by parts, definite integrals, application **6 Hours**

UNIT-V

Differential Equations : Some basic definitions, Order and degree,Equations in separable from, Homogeneous equations, Linear Differential equations, Exact equations, Application in solving

Pharmacokinetic equations

Laplace Transform: Introduction, Definition, Properties of Laplace transform, Laplace Transforms of elementary functions, Inverse Laplace transforms, Laplace transform of derivatives, Application to solve Linear differential equations, **Application in solving Chemical kinetics and Pharmacokinetics equations**

6 Hours

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Differential Calculus	Shanthinarayan		
2	Pharmaceutical Mathematics with application to Pharmacy	Panchaksharappa Gowda D.H.		

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Integral Calculus by Shanthinarayan	Shanthinarayan		
2	Higher Engineering Mathematics	Dr.B.S.Grewal		

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SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108201	Human Anatomy and Physiology – II – Theory (BP201T)	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	75	15	10	50	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Upon completion of this course the student should be able to: • Explain the gross morphology, structure and functions of various organs of the human body. • Describe the various homeostatic mechanisms and their imbalances. • Identify the various tissues and organs of different systems of human body. • Perform the haematological tests like blood cell counts, haemoglobin estimation, bleeding/clotting time etc and also record blood pressure, heart rate, pulse and respiratory volume. • Appreciate coordinated working pattern of different organs of each system. • Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of the human body.	On successful completion of the course, the student will be able to: **CO1:-** Describe the composition and functions of blood component and mechanism of blood coagulation. **CO2:-** Explain the physiology of cardiovascular, digestive, respiratory, urinary and reproductive system. **CO3:-** Detail the gross morphology, structure and function of various organs of human body. **CO4:-** Explain the relevance and significance of human genetics**.**

Unit I

- **Body fluids and blood-** Body fluids, composition and Functions of blood, hemopoiesis, the formation of haemoglobin, anaemia, mechanisms of coagulation, blood grouping, Rh factors, transfusion, its significance and disorders of the
- blood, Reticulo endothelial system.
- **Lymphatic system-** Lymphatic organs and tissues, lymphatic vessels, lymph circulation and functions of lymphatic system **10 Hours**

Unit II

- **Cardiovascular system-** Heart – anatomy of the heart, blood circulation, blood vessels, structure and functions of artery, vein and capillaries, elements of the conduction system of heart and heart beat, its regulation by autonomic nervous system, cardiac output, cardiac cycle. Regulation of blood pressure, pulse, electrocardiogram and disorders of the heart. **10 Hours**

UnitIII

- **Digestivesystem-** 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.
- **Respiratorysystem-** Anatomyof respiratory system with special reference to anatomy of lungs, mechanism of respiration, regulation of respiration. **6 Hours**

Unit IV

- **Respiratorysystem-** Lung Volumes and capacities transport of respiratory gases, artificial respiration, and resuscitation methods.
- **Urinarysystem-** Anatomyof the urinary tract with special reference to theanatomyof kidney and nephrons, functions of kidney and urinary tract, physiology of urine formation, micturition reflex and role of kidneys in acid- base balance, the role of RAS in kidney and disorders of the kidney. **10 Hours**

Unit V

- **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 togenetics**
  Chromosomes, genes and DNA, protein synthesis, genetic pattern of inheritance **9 Hours**

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SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108291	Human Anatomy and Physiology – II Practical (BP207P)	L =	T =	P =4	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	35	10	5	50	3 Hrs

List of Experiments
1. Introduction to hemocytometry. 2. Enumeration of white blood cell (WBC)count 3. Enumeration of total red blood corpuscles (RBC) count 4. Determination of bleedingtime 5. Determination of clottingtime 6. Estimation of haemoglobincontent 7. Determination of blood group. 8. Determination of erythrocyte sedimentation rate(ESR). 9. Determination of heart rate and pulserate. 10. Recording of bloodpressure. 11. Determination of tidal volume and vitalcapacity. 12. Study of digestive, respiratory, cardiovascular systems, urinary and reproductive systems with the help of models, charts andspecimens. 13. Recording of the basal massindex. 14. Study of family planning devices and pregnancy diagnosistest. 15. Demonstration of total blood count by cellanalyser 16. Permanent slides of vital organs andgonads.

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Essentials of Medical Physiology	K. Sembulingam and P. Sembulingam	Six	Jaypeebrothers medical publishers, New Delhi.
2	Physiological basis of Medical Practice	Best and Taylor	Thirteenth	Williams & Wilkins Co, Riverview, MI USA
3	Textbook of anatomy & physiology	Patton, Thibeau	fifteenth	Elsevier

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Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Text book of Medical Physiology	Arthur C, Guyton and John.E. Hall	Eleventh	Miamisburg, OH, U.S.A
2	Principles of Anatomy and Physiology	Tortora Grabowski	Fifth	Eastern press
3	Anatomy and Physiology in Health and Illness	Kathleen J.W. Wilson	Eleventh	Churchill Livingstone, New York

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SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108202	Pharmaceutical Organic Chemistry – I –Theory (BP202T)	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	75	15	10	100	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
After course completion, the student shall able to: • Write the structure name and the types of isomerism of the organic compound • Write the reactions, name the reaction and orientation of reaction • Account for reactivity/stability of compound Identify/ confirm the identification of organic compounds	On successful completion of the course, the student will be able to: **CO1-** Reproduce the structure, name and the type of isomerism of the organic compound. **CO2-** State the reaction, name the reaction and orientation of reactions. **CO3-** Describe the reactivity/stability of compounds. **CO4-** Summarize the identification of an organic compound.

General methods of preparation and reactions of compounds superscripted with asterisk (*) to be explained

To emphasize on definition, types, classification, principles/mechanisms, applications, examples and differences

UNIT-

- **Classification, nomenclature andisomerism-** Classification of Organic Compounds, Common and IUPAC systems of nomenclature of organic compounds (up to 10 Carbons open chain and carbocyclic compounds), Structural isomerismsin organic compounds **I7 Hours**

UNIT-II

- **Alkanes*, Alkenes* and Conjugateddienes*-** SP^3hybridization in alkanes, Halogenation of alkanes, use of paraffins. Stabilities of alkenes, hybridization in alkenes E_1 andE_2 reactions - kinetics, theorderof reactivity of alkyl halides, rearrangement of carbocations, Saytzeffs orientation and evidence. E_1verses E_2 reactions, Factors affecting E_1 and E_2reactions. Ozonolysis, electrophilicadditionreactionsofalkenes,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 **10 Hours**

UNIT-III

- **Alkylhalides*-** SN_1 and SN_2 reactions - kinetics, theorder 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 ethyl chloride, Chloroform, trichloroethylene, tetrachloroethylene, dichloromethane, tetrachloromethane and iodoform.

- **Alcohols*-**Qualitative tests, Structure and uses of Ethyl alcohol, chlorobutanol, Cetosterylalcohol, Benzyl alcohol, Glycerol, Propylene glycol **10 Hours**

UNIT-IV

- **Carbonyl compounds* (Aldehydes andketones)**
  Nucleophilic addition, Electromeric effect, aldol condensation, Crossed Aldol condensation, Cannizzaroreaction, Crossed Cannizzaro reaction, Benzoin condensation, Perkin condensation, qualitative tests, Structure and uses of Formaldehyde, Paraldehyde, Acetone, Chloral hydrate, Hexamine, Benzaldehyde, Vanilin, Cinnamaldehyde. **10 Hours**

UNIT-V

- **Carboxylicacids***

  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, theeffect of substituent on Basicity. Qualitative test, Structure anduses of Ethanolamine, Ethylenediamine,Amphetamine. **8 Hours**

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SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108292	Pharmaceutical Organic Chemistry–I Practical (BP208P)	L =	T =	P =4	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	35	10	5	50	3 Hrs

List of Experiments

- **Systematic qualitative analysis of unknown organic compoundslike**

1. Preliminary test: Color, odour, aliphatic/aromatic compounds, saturation and unsaturation,etc.
2. Detection of elements like Nitrogen, Sulphur and HalogenbyLassaigne's test
3. Solubilitytest
4. Functional group test like Phenols, Amides/ Urea, Carbohydrates, Amines, Carboxylic acids, Aldehydes and Ketones, Alcohols, Esters, Aromatic and Halogenated Hydrocarbons, Nitro compounds and Anilides.
5. Melting point/Boiling point of organiccompounds
6. Identification of the unknown compound from the literature using melting point/ boiling point.
7. Preparation of the derivatives and confirmation of the unknown compound by melting point/ boilingpoint.
8. Minimum 5 unknown organic compounds to be analysedsystematically.

- **Preparation of suitable solid derivatives from organiccompounds**
- **Construction of molecularmodels**

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Organic chemistry	I.L Finar	Sixth	Pearson

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Organic chemistry	Morrison &boyd	sixth	Pearson
2	Text book of organic chemistry	B.S Bahl&ArunBahl	22nd	S.Chand

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SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108203	Biochemistry – Theory (BP203T)	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	75	15	10	100	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
After course completion, the student shall able to understand. • The catalytic role of enzymes, the importance of enzyme inhibitors in the design of new drugs, therapeutic and diagnostic applications of enzymes. • The metabolism of nutrient molecules in physiological and pathological conditions. The genetic organisation of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.	On successful completion of the course, the student will be able to: **CO1-** Interpret the catalytic role of enzymes,the importance of enzyme inhibitors in the design of new drugs. **CO2 -** Sketch the role of enzymes and enzyme inhibitors in the therapy and diagnosis. **CO3 -** Analyze the metabolism of nutrient molecules in physiological and pathological conditions. **CO4-** Figure out the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins

UNIT- I

- **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
- **Biologicaloxidation-** Electron transport chain (ETC) and its mechanism.Oxidativephosphorylation&itsmechanis and substrate level phosphorylation Inhibitors ETC and oxidative phosphorylation/Uncouplers **10 Hours**

UNIT- II

- **Lipid metabolis-** β-Oxidation of saturated fatty acid (Palmitic acid), Formation and utilization of ketone bodies; ketoacidosis De novo synthesis of fatty acids (Palmiticacid), 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 acidmetabolism -** 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. **10 Hours**

UNIT- III

- **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.StructureofDNA and RNA and their functions DNA replication (semi conservative model). Transcription or RNA synthesis. Genetic code, Translation or Protein synthesis and inhibitors **10 Hours**

UNIT-IV

- **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 **8 Hours**

UNIT-V

- **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 **7 Hours**

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Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108293	Biochemistry– Practical (BP209P)	L =	T =	P =4	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	35	10	5	50	3 Hrs

List of Experiments

1. Qualitative analysis of carbohydrates (Glucose, Fructose, Lactose, Maltose, Sucrose and starch)
2. Identification tests for Proteins (albumin andCasein)
3. Quantitative analysis of reducing sugars (DNSA method) and Proteins (Biuret method)
4. Qualitative analysis of urine for abnormalconstituents
5. Determination of bloodcreatinine
6. Determination of bloodsugar
7. Determination of serum totalcholesterol
8. Preparation of buffer solution and measurement ofpH
9. Study of enzymatic hydrolysis ofstarch
10. Determination of Salivary amylaseactivity
11. Study the effect of Temperature on Salivary amylaseactivity.
12. Study the effect of substrate concentration on salivary amylaseactivity.

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Biochemistry	D. Satyanarayan and U. Chakrapani	5th edition 2019	Elsevier
2	Fundamentals of Biochemistry	A. C deb	7th edition 2019	New Central Book Agency-Kolkata
3	Practical Biochemistry	R. C. Gupta and S. Bhargavan	5th edition	CBS
4	Practical Biochemistry	Harold Valey	4th edition	London

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Principles of Biochemistry	Lehninger	4th edition	Freeman and Company
2	Harper's Biochemistry	Robert k, Murry, Daryl K. Granner and Victor W. Rodwell	28th edition	McGraw Hill Professional,
3	Bio chemistry	Stryer	9th edition	Freeman and Company
4	Practical Biochemistry for Medical Students	Rajagopal and Ramkrishna	3rd edition	orient longman
5	Introduction of Practical Biochemistry	David T. Plummer	3rd edition	Tata McGraw Hill,

Shri Shankaracharya Technical Campus

Shri Shankaracharya Group of Institutions

Faculty of Pharmaceutical Sciences

(An Autonomous Institute affiliated to Chhattisgarh Swami Vivekanand Technical University, Bhilai)

SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108204	Computer Applications in Pharmacy–Theory (BP205T)	L = 2	T = 1	P = 0	Credits = 3
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	50	15	10	75	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
After course completion, the student shall able to understand. • To understand the basic concepts of computer and organization of a computer. • To understand the basic concept of operating system and its working • To introduce the concept of HTML. • To introduce the concept of application of Computer in pharmacy. To introduce the concept of bioinformatics.	On successful completion of the course, the student will be able to: **CO1 -** Student will be familiar with fundamentals of computers and organization of computer. **CO2-** Students will be familiar with various concept of operating system and its working **CO3-** Students will be familiar with the various concept of HTML. **CO4-** Students will be familiar with application of Computer in pharmacy **CO5-** Students will also get knowledge about bioinformatics

UNIT – I

- **Introduction to Computer and Hardware**: Introduction of Information Technology, Concept of Data and Information, Data processing, History of Computers, Organization of computers, Input and output devices, Storage devices and file organization system, Applications of Information Technology in business, industry, entertainment, science , engineering and medicine. **[6 Hours]**

UNIT - II

- **Basics of Operating System** Definition of Operating System Objectives, types, and functions of Operating Systems Working with Windows Operating System: Introduction, The Desktop, Structure of Windows, Windows Explorer, File and Folder Operations, The Search, The Recycle Bin, Configuring the Screen, Adding or Removing New Programs using Control Panel, Applications in windows (Paint, Notepad, WordPad, Calculator).

UNIT - III

- **Introduction to HTML**. Introduction to HTML. Working of HTML Creating and loading HTML page, tags Structure of on HTML, Document, Stand Alone Tags Formatting text, Adding Images Creating hyper Links, Tables Sending E-mails through Web Page Sample web pages.

UNIT - IV

- **Application of computers in Pharmacy** – Drug information storage and retrieval, Pharmacokinetics, Hospital and Clinical Pharmacy, barcode medicine identification and automated dispensing of drugs, mobile technology and adherence monitoring.

UNIT - V

- **Bioinformatics:** Introduction, Objective of Bioinformatics, Bioinformatics Databases, Concept of Bioinformatics, Impact of Bioinformatics in Vaccine Discovery.

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SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108294	Computer Applications in Pharmacy – Practical* (BP210P)	L =	T =	P = 2	Credits = 1
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	15	5	5	25	3 Hrs

List of Experiments
1. Internal and external command of DOS.
2. Create your resume using MS word.
3. Create mark sheet using Ms Excel.
4. Create Power point presentation.
5. Creating mail label using label wizard in MS WORD.
6 . Create a database in MS ACCESS to store patient information
7. Design a form using MS ACCESS to ADD, View, delete and modify the patient record in database.
8 Generate a report and print the report of patient information.
9. Design a HTML page describing your profile in one paragraph. Design in such a way that it has a heading, a horizontal rule, three links and your photo also write three HTML documents for the links.
10. Design HTML page describing your academic career. The page will tell about the degrees, Institutions and your hobbies. Add some lists too.
11. Design HTML page demonstrating Concept Of Internal Hyper-link.
12. Design HTML page which gives the list of grocery Items by using Unordered List bullets are of form disc, square and circle.

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Computers Today	S.K.Basadra	2nd	Galgotia Publication
2	Internet for Every One	Alexis Leon and Mathews Leon	2nd print.	Tech World

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Introduction to Computers	P.K.Sinha	6th	BPB Publication
2	Fundamentals of Computers	V.Rajaraman	4th	Prentice Hall of India

		October 2020	1.00	Applicable for AY 2020-21 Onwards
Chairman (AC)	Chairman (BoS)	Date of Release	Version	

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SCHEME OF EXAMINATION AND SYLLABUS (Effective from 2020-2021 Batch)

Bachelor in Pharmacy First Year (1st/ 2nd semester)

Subject Code PH108205	Environmental sciences – Theory* (BP206T)	L = 2	T = 1	P = 0	Credits = 3
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	50	15	10	50	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
After course completion, the student shall able to understand. • Create awareness about environmental problems among learners. Impart basic knowledge about the environment and its allied problems. • Develop an attitude of concern for the environment. Strive to attain harmony with nature. • Motivate learner to participate in environment protection and environment improvement. Acquire skill to help the concerned individuals in identifying and solving environmental problems.	On successful completion of the course, the student will be able to: **CO1-** Create the awareness and Impart basic knowledge about the environment and its allied problems**.** **CO2-** Develop an attitude of concern for the environment and Strive to attain harmony with nature. **CO3-** Motivate learner to participate in environment protection and environment improvement. **CO4-** Acquire skills to help the concerned individuals in identifying and solving environmental problems.

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.

10 Hours

UNIT –II

Ecosystems

- The concept of anecosystem.
- Structure and function of anecosystem.
- Introduction,types,characteristicfeatures,structureandfunctionof the ecosystems: Forest ecosystem; Grassland ecosystem;Desert ecosystem; Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

10 Hours

UNIT- III

Environmental Pollution: Air pollution; Water pollution; Soil pollution **10 Hours**

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Environmental science	Y. K. Sing		New age International Pvt Publishers
2	Environmental Biology	K. C. Agarwal		Nidhi publication Pvt. Ltd.
3	The Biodiversity of India	BharuchaErach		MapinPuBlishingPvt. Ltd.

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Environmental Encyclopedia	W. P. Cunningham, T. H. Cooper, T. H. Gorhani and M. T. Hepworth	2001	Jaico Publishing House
2	Environmental Chemistry	A. K. De		Wiley Eastern Ltd.
3	Hazardous Waste Incineration	R. C. Clark		Clanderson Press Oxford