

<b>School: Pharmaceutical Sciences</b>	<b>Programme: B.Pharmacy</b>
<b>Year : First Year</b>	<b>Semester - I</b>
<b>Course: Human Anatomy and Physiology I-Theory</b>	<b>Course Code: 17YBH101</b>
<b>Theory: 3Hrs/Week</b>	<b>Max.University Theory Examination:75 Marks</b>
<b>Max. Time for Theory Exam.:3 Hrs</b>	<b>Continuous Internal Assessment: 25 Marks</b>

<b>Objectives</b>	
<b>1</b>	Explain the relevance and significance of Human Anatomy and Physiology to Pharmaceutical Sciences
<b>2</b>	Explain basic terminologies used in anatomy and physiology as well as prefixes & suffixes used to identify body parts and directional terms
<b>3</b>	Explain the gross morphology, structure and functions of various organs of the human body.
<b>4</b>	Clarify the progression of structural levels (cells, tissues, organs, and systems) contributes to the body's order, there function and stability.
<b>5</b>	Demonstrate how all parts of the human body contribute to the maintenance of homeostasis

<b>Unit Number</b>	<b>Details</b>	<b>Hours</b>
<b>1</b>	<p><b>Introduction to human body</b> Definition and scope of anatomy and physiology, levels of structural organization and body systems, basic life processes, homeostasis, basic anatomical terminology.</p> <p><b>Cellular level of organization</b> Structure and functions of cell, transport across cell membrane, cell division, cell junctions. General principles of cell communication, intracellular signaling pathway activation by extracellular signal molecule, Forms of intracellular signaling: a) Contact-dependent b) Paracrine c) Synaptic d)Endocrine</p> <p><b>Tissue level of organization</b> Classification of tissues, structure, location and functions of epithelial, muscular and nervous and connective tissues.</p>	<b>10</b>
<b>2</b>	<p><b>Integumentary system</b> Structure and functions of skin</p> <p><b>Skeletal system</b> Divisions of skeletal system, types of bone, salient features and functions of bone axial and appendicular skeletal system Organization of skeletal muscle, physiology of muscle contraction, neuromuscular junction</p> <p><b>Joints</b> Structural and functional classification, types of joints movements and its articulation</p>	<b>10</b>
<b>3</b>	<p><b>Body fluids and blood</b></p> <ul style="list-style-type: none"> <li>• Body fluids, composition and functions of blood, hemopoiesis, formation of hemoglobin, anemia, mechanisms of coagulation, blood grouping, Rh factors, transfusion, its significance and disorders of blood, Reticulo endothelial system.</li> <li>• <b>Lymphatic system</b></li> </ul>	<b>10</b>

	Lymphatic organs and tissues, lymphatic vessels, lymph circulation and functions of lymphatic system	
<b>4</b>	<b>Peripheral nervous system:</b> Classification of peripheral nervous system: Structure and functions of sympathetic and parasympathetic nervous system. Origin and functions of spinal and cranial nerves. <b>Special senses</b> Structure and functions of eye, ear, nose and tongue and their disorders.	<b>8</b>
<b>5</b>	<b>Cardiovascular system</b> Heart – anatomy of heart, blood circulation, blood vessels, structure and functions of artery, vein and capillaries, elements of 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 heart. 30	<b>7</b>
<b>Total</b>		<b>45</b>

<b>Resources</b>	
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1. Principles of Anatomy and Physiology by Tortora Grabowski. Palmetto, GA,U.S.A.</li> <li>2. Textbook of Human Histology by Inderbir Singh, Jaypee brother's medical publishers, New Delhi.</li> <li>3. Textbook of Practical Physiology by C.L. Ghai, Jaypee brother's medical publishers, NewDelhi.</li> <li>4. Practical workbook of Human Physiology by K. Srinageswari and Rajeev Sharma, Jaypee brother's medical publishers, NewDelhi</li> </ol>
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. Physiological basis of Medical Practice-Best and Tailor. Williams &amp; Wilkins Co, Riverview, MIUSA</li> <li>2. Text book of Medical Physiology- Arthur C, Guyton and John. E. Hall. Miamisburg, OH, U.S.A.</li> <li>3. Human Physiology (vol 1 and 2) by Dr. C.C. Chatterrje ,Academic Publishers Kolkata</li> <li>4. Anatomy and Physiology in Health and Illness by Kathleen J.W. Wilson, Churchill Livingstone, NewYork</li> <li>5. Essentials of Medical Physiology by K. Sembulingam and P. Sembulingam. Jaypee brothers medical publishers, New Delhi.</li> </ol>

<b>School: Pharmaceutical Sciences</b>	<b>Programme: B.Pharmacy</b>
<b>Year : First Year</b>	<b>Semester - I</b>
<b>Course: Pharmaceutical Analysis I – Theory</b>	<b>Course Code: 17YBH102</b>
<b>Theory: 3Hrs/Week</b>	<b>Max.University Theory Examination:75 Marks</b>
<b>Max. Time for Theory Exam.:3 Hrs</b>	<b>Continuous Internal Assessment: 25 Marks</b>

Objectives	
1	Understand the basic principles, instrumentation and applications of various analytical techniques mentioned below which are used in pharmaceutical industry for quality control of chemicals, drug intermediates, APIs, excipients, pharmaceutical formulations and cosmetic products
2	Understand the fundamentals of analytical chemistry.
3	Develop analytical skills

Unit Number	Details	Hours
1	<p><b>(a) Pharmaceutical analysis-</b> Definition and scope</p> <ul style="list-style-type: none"> <li>i) Different techniques of analysis</li> <li>ii) Methods of expressing concentration</li> <li>iii) Primary and secondary standards.</li> <li>iv) Preparation and standardization of various molar and normal solutions- Oxalic acid, sodium hydroxide, hydrochloric acid, sodium thiosulphate, sulphuric acid, potassium permanganate and ceric ammonium sulphate</li> </ul> <p><b>(b) Errors:</b> Sources of errors, types of errors, methods of minimizing errors, accuracy, precision and significant figures</p>	10
2	<ul style="list-style-type: none"> <li>• <b>Acid base titration:</b> 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</li> <li>• <b>Non aqueous titration:</b> Solvents, acidimetry and alkalimetry titration and estimation of Sodium benzoate and Ephedrine HCl</li> </ul>	10
3	<ul style="list-style-type: none"> <li>• <b>Precipitation titrations:</b> Mohr's method, Volhard's, Modified Volhard's, Fajans method, estimation of sodium chloride.</li> <li>• <b>Complexometric titration:</b> Classification, metal ion indicators, masking and demasking reagents, estimation of Magnesium sulphate, and calcium gluconate.</li> <li>• <b>Gravimetry:</b> Principle and steps involved in gravimetric analysis. Purity of the precipitate: co-precipitation and post precipitation, Estimation of barium sulphate.</li> </ul>	10
4	<p><b>Redox titrations</b></p> <ul style="list-style-type: none"> <li>(a) Concepts of oxidation and reduction</li> <li>(b) Types of redox titrations (Principles and applications) Cerimetry, Iodimetry, Iodometry, Bromatometry, Dichrometry, Titration with potassium iodate</li> </ul> <p>Basic Principles, methods and application of diazotisation titration.</p>	8

	33	
5	<ul style="list-style-type: none"> <li>• <b>Electrochemical methods of analysis</b></li> <li>• <b>Conductometry</b>- Introduction, Conductivity cell, Conductometric titrations, applications.</li> <li>• <b>Potentiometry</b> - Electrochemical cell, construction and working of 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.</li> <li>• <b>Polarography</b> - Principle, Ilkovic equation, construction and working of dropping mercury electrode and rotating platinum electrode, applications</li> </ul>	7
<b>Total</b>		<b>45</b>

Resources	
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1. A.H. Beckett &amp; J.B. Stenlake's, Practical Pharmaceutical Chemistry Vol I &amp; II, Stahlone Press of University of London</li> <li>2. A.I. Vogel, Text Book of Quantitative Inorganic analysis</li> <li>3. P. Gundu Rao, Inorganic Pharmaceutical Chemistry</li> <li>4. Indian Pharmacopoeia</li> </ol>
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. Bentley and Driver's Textbook of Pharmaceutical Chemistry</li> <li>2. John H. Kennedy, Analytical chemistry principles</li> <li>3. Principles of instrumental analysis- Skoog</li> <li>4. Instrumental methods of analysis- Chatwal and Anand</li> <li>5. Instrumental methods of analysis- Willard</li> <li>6. Textbook of Pharmaceutical analysis- K.A. Connors</li> </ol>

<b>School: Pharmaceutical Sciences</b>	<b>Programme: B.Pharmacy</b>
<b>Year : First Year</b>	<b>Semester - I</b>
<b>Course: Pharmaceutics I – Theory</b>	<b>Course Code: 17YBH103</b>
<b>Theory: 3Hrs/Week</b>	<b>Max.University Theory Examination:75 Marks</b>
<b>Max. Time for Theory Exam.:3 Hrs</b>	<b>Continuous Internal Assessment: 25 Marks</b>

<b>Objectives</b>	
<b>1</b>	Know the history of profession of pharmacy
<b>2</b>	Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations
<b>3</b>	Understand the professional way of handling the prescription
<b>4</b>	Impart a fundamental knowledge on the preparatory pharmacy with arts and science of preparing the different conventional dosage forms

<b>Unit Number</b>	<b>Details</b>	<b>Hours</b>
<b>1</b>	<ul style="list-style-type: none"> <li>• <b>Historical background and development of profession of pharmacy:</b> History of profession of Pharmacy in India in relation to pharmacy education, industry and organization, Pharmacy as a career, Pharmacopoeias: Introduction to IP, BP, USP and Extra Pharmacopoeia.</li> <li>• <b>Dosage forms:</b> Introduction to dosage forms, classification and definitions</li> <li>• <b>Prescription:</b> Definition, Parts of prescription, handling of Prescription and Errors in prescription.</li> <li>• <b>Posology:</b> Definition, Factors affecting posology. Pediatric dose calculations based on age, body weight and body surface area</li> </ul>	<b>10</b>
<b>2</b>	<ul style="list-style-type: none"> <li>• <b>Pharmaceutical calculations:</b> Weights and measures – Imperial &amp; Metric system, Calculations involving percentage solutions, alligation, proof spirit and isotonic solutions based on freezing point and molecular weight.</li> <li>• <b>Powders:</b> Definition, classification, advantages and disadvantages, Simple &amp; compound powders – official preparations, dusting powders, effervescent, efflorescent and hygroscopic powders, eutectic mixtures. Geometric dilutions.</li> <li>• <b>Liquid dosage forms:</b> Advantages and disadvantages of liquid dosage forms. Excipients used in formulation of liquid dosage forms. Solubility enhancement techniques</li> </ul>	<b>10</b>
<b>3</b>	<ul style="list-style-type: none"> <li>• <b>Monophasic liquids:</b> Definitions and preparations of Gargles, Mouthwashes, Throat Paint, Eardrops, Nasal drops, Enemas, Syrups, Elixirs, Liniments and Lotions.</li> <li>• <b>Biphasic liquids:</b></li> <li>• <b>Suspensions:</b> Definition, advantages and disadvantages, classifications, Preparation of suspensions; Flocculated and Deflocculated suspension &amp; stability problems and methods to overcome.</li> <li>• <b>Emulsions:</b> Definition, classification, emulsifying agent, test for the identification of type of Emulsion, Methods of preparation &amp; stability problems and methods to overcome.</li> </ul>	<b>8</b>

<b>4</b>	<ul style="list-style-type: none"> <li>• <b>Suppositories:</b> Definition, types, advantages and disadvantages, types of bases, methods of preparations. Displacement value &amp; its calculations, evaluation of suppositories.</li> <li>• <b>Pharmaceutical incompatibilities:</b> Definition, classification, physical, chemical and therapeutic incompatibilities with examples.</li> </ul>	<b>8</b>
<b>5</b>	<ul style="list-style-type: none"> <li>• <b>Semisolid dosage forms:</b> 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</li> </ul>	<b>7</b>
<b>Total</b>		<b>45</b>

<b>Resources</b>	
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1. H.C. Ansel et al., Pharmaceutical Dosage Form and Drug Delivery System, Lippincott Williams and Walkins, New Delhi.</li> <li>2. Carter S.J., Cooper and Gunn's-Dispensing for Pharmaceutical Students, CBS publishers, New Delhi.</li> <li>3. M.E. Aulton, Pharmaceutics, The Science &amp; Dosage Form Design, Churchill Livingstone, Edinburgh.</li> <li>4. Indian pharmacopoeia.</li> <li>5. British pharmacopoeia.</li> <li>6. Lachmann. Theory and Practice of Industrial Pharmacy, Lea &amp; Febiger Publisher, The University of Michigan</li> <li>7. Mehta RM. Pharmaceutics I. Delhi: Vallabh Prakashan; 2014.</li> </ol>
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. Alfonso R. Gennaro Remington. The Science and Practice of Pharmacy, Lippincott Williams, New Delhi.</li> <li>2. Carter S.J., Cooper and Gunn's. Tutorial Pharmacy, CBS Publications, New Delhi.</li> <li>3. E.A. Rawlins, Bentley's Text Book of Pharmaceutics, English Language Book Society, Elsevier Health Sciences, USA.</li> <li>4. Isaac Ghebre Sellassie: Pharmaceutical Pelletization Technology, Marcel Dekker, INC, New York.</li> <li>5. Dilip M. Parikh: Handbook of Pharmaceutical Granulation Technology, Marcel Dekker, INC, New York.</li> <li>6. Francoise Nieloud and Gilberte Marti-Mestres: Pharmaceutical Emulsions and Suspensions, Marcel Dekker, INC, New York</li> </ol>

<b>School: Pharmaceutical Sciences</b>	<b>Programme: B.Pharmacy</b>
<b>Year : First Year</b>	<b>Semester - I</b>
<b>Course: Pharmaceutical Inorganic Chemistry – Theory</b>	<b>Course Code: 17YBH104</b>
<b>Theory: 3Hrs/Week</b>	<b>Max.University Theory Examination:75 Marks</b>
<b>Max. Time for Theory Exam.:3 Hrs</b>	<b>Continuous Internal Assessment: 25 Marks</b>

Objectives	
1	Know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals
2	Study of monographs of inorganic drugs and pharmaceuticals
3	Understand the medicinal and pharmaceutical importance of inorganic compounds

Unit Number	Details	Hours
1	<b>Impurities in pharmaceutical substances:</b> 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 <b>General methods of preparation,</b> assay for the compounds superscripted with asterisk (*), properties and medicinal uses of inorganic compounds belonging to the following classes	10
2	<ul style="list-style-type: none"> <li><b>Acids, Bases and Buffers:</b> Buffer equations and buffer capacity in general, buffers in pharmaceutical systems, preparation, stability, buffered isotonic solutions, measurements of tonicity, calculations and methods of adjusting</li> <li><b>Major extra and intracellular electrolytes:</b> Functions 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.</li> <li><b>Dental products:</b> Dentifrices, role of fluoride in the treatment of dental caries, Desensitizing agents, Calcium carbonate, Sodium fluoride, and Zinc eugenol cement. isotonicity.</li> </ul>	10
3	<ul style="list-style-type: none"> <li><b>Gastrointestinal agents</b> <b>Acidifiers:</b> Ammonium chloride* and Dil. HCl <b>Antacid:</b> Ideal properties of antacids, combinations of antacids, Sodium Bicarbonate*, Aluminum hydroxide gel, Magnesium hydroxide mixture <b>Cathartics:</b> Magnesium sulphate, Sodium orthophosphate, Kaolin and Bentonite <b>Antimicrobials:</b> Mechanism, classification, Potassium permanganate, Boric acid, Hydrogen peroxide*, Chlorinated lime*, Iodine and its preparations</li> </ul>	10
4	<ul style="list-style-type: none"> <li><b>Miscellaneous compounds</b> <b>Expectorants:</b> Potassium iodide, Ammonium chloride*. <b>Emetics:</b> Copper sulphate*, Sodium potassium tartarate <b>Haematinics:</b> Ferrous sulphate*, Ferrous gluconate <b>Poison and Antidote:</b> Sodium thiosulphate*, Activated charcoal, Sodium</li> </ul>	8

	nitrite333 <b>Astringents:</b> Zinc Sulphate, Potash Alum	
<b>5</b>	• <b>Radiopharmaceuticals:</b> Radio activity, Measurement of radioactivity, Properties of $\alpha$ , $\beta$ , $\gamma$ radiations, Half life, radio isotopes and study of radio isotopes - Sodium iodide I <sup>131</sup> , Storage conditions, precautions & pharmaceutical application of radioactive substances.	<b>7</b>
<b>Total</b>		<b>45</b>

<b>Resources</b>	
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1. A.H. Beckett &amp; J.B. Stenlake's, Practical Pharmaceutical Chemistry Vol I&amp;II, Stahlone Press of University of London, 4<sup>th</sup>edition.</li> <li>2. A.I. Vogel, Text Book of Quantitative Inorganic analysis</li> <li>3. P. Gundu Rao, Inorganic Pharmaceutical Chemistry, 3<sup>rd</sup>Edition</li> <li>4. Anand &amp; Chatwal, Inorganic Pharmaceutical Chemistry</li> <li>5. Indian Pharmacopoeia</li> <li>6. Block JH, Roche EB, Soine TO, Wilson CO. Inorganic medicinal and pharmaceutical chemistry</li> <li>7. Pandey OP, Bajpai DN, Giri S. Practical Chemistry. S Chand Publishers</li> <li>8. Textbook of Inorganic pharmaceutical chemistry By Dr. Kasture and Wadodkar</li> <li>9. D.P.Belsare &amp; A S Dhake, Practical Inorganic Pharmaceautical Chemistry</li> </ol>
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. Skoog DA, West DM. Fundamental of analytical chemistry.</li> <li>2. Walton. Principles and methods of chemical analysis. 6th ed</li> <li>3. M.L Schroff, Inorganic Pharmaceutical Chemistry</li> <li>4. Bentley and Driver's Textbook of Pharmaceutical Chemistry</li> </ol>



<b>School: Pharmaceutical Sciences</b>	<b>Programme: B.Pharmacy</b>
<b>Year : First Year</b>	<b>Semester - I</b>
<b>Course: Communication skills – Theory</b>	<b>Course Code: 17YBH105</b>
<b>Theory: 2Hrs/Week</b>	<b>Max.University Theory Examination:35 Marks</b>
<b>Max. Time for Theory Exam.:1.5 Hrs</b>	<b>Continuous Internal Assessment: 15 Marks</b>

<b>Objectives</b>	
<b>1</b>	Understand the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation
<b>2</b>	Communicate effectively (Verbal and NonVerbal)
<b>3</b>	Effectively manage the team as a team player
<b>4</b>	Develop interview skills
<b>5</b>	Develop Leadership qualities and essentials
<b>6</b>	Understand the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation

<b>Unit Number</b>	<b>Details</b>	<b>Hours</b>
<b>1</b>	<ul style="list-style-type: none"> <li>• <b>Communication Skills:</b> Introduction, Definition, The Importance of Communication, The Communication Process – Source, Message, Encoding, Channel, Decoding, Receiver, Feedback, Context</li> <li>• <b>Barriers to communication:</b> Physiological Barriers, Physical Barriers, Cultural Barriers, Language Barriers, Gender Barriers, Interpersonal Barriers, Psychological Barriers, Emotional barriers</li> <li>• <b>Perspectives in Communication:</b> Introduction, Visual Perception, Language, Other factors affecting our perspective - Past Experiences, Prejudices, Feelings, Environment</li> </ul>	<b>7</b>
<b>2</b>	<ul style="list-style-type: none"> <li>• <b>Elements of Communication:</b> Introduction, Face to Face Communication - Tone of Voice, Body Language (Non-verbal communication), Verbal Communication, Physical Communication</li> <li>• <b>Communication Styles:</b> Introduction, The Communication Styles Matrix with example for each -Direct Communication Style, Spirited Communication Style, Systematic Communication Style, Considerate Communication Style</li> </ul>	<b>7</b>
<b>3</b>	<ul style="list-style-type: none"> <li>• <b>Basic Listening Skills:</b> Introduction, Self-Awareness, Active Listening, Becoming an Active Listener, Listening in Difficult Situations</li> <li>• <b>Effective Written Communication:</b> Introduction, When and When Not to Use Written Communication - Complexity of the Topic, Amount of Discussion' Required, Shades of Meaning, Formal Communication</li> <li>• <b>Writing Effectively:</b> Subject Lines, Put the Main Point First, Know Your Audience, Organization of the Message</li> </ul>	<b>7</b>
<b>4</b>	<ul style="list-style-type: none"> <li>• <b>Interview Skills:</b> Purpose of an interview, Do's and Dont's of an interview</li> </ul>	<b>5</b>

	• <b>Giving Presentations:</b> Dealing with Fears, Planning your Presentation, Structuring Your Presentation, Delivering Your Presentation, Techniques of Delivery	
<b>5</b>	<b>Group Discussion:</b> Introduction, Communication skills in group discussion, Do's and Dont's of group discussion	<b>4</b>
<b>Total</b>		<b>30</b>

<b>Resources</b>	
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1. Communication skills, Sanjay Kumar, Pushpalata, 1<sup>st</sup>Edition, Oxford Press,2011</li> <li>2. Organizational Behaviour, Stephen .P. Robbins, 1<sup>st</sup>Edition, Pearson,2013</li> <li>3. Brilliant- Communication skills, Gill Hasson, 1<sup>st</sup>Edition, Pearson Life,2011</li> <li>4. The Ace of Soft Skills: Attitude, Communication and Etiquette for success, Gopala Swamy Ramesh, 5<sup>th</sup>Edition, Pearson,2013</li> <li>5. Developing your influencing skills, Deborah Dalley, Lois Burton, Margaret, Green hall, 1st Edition Universe of Learning LTD,2010</li> <li>6. Communication skills for professionals, Konar nira, 2<sup>nd</sup>Edition, New arrivals – PHI,2011</li> <li>7. Personality development and soft skills, Barun K Mitra, 1<sup>st</sup>Edition, Oxford Press, 2011</li> </ol>
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. Soft skill for everyone, Butter Field, 1st Edition, Cengage Learning india pvt.ltd, 2011</li> <li>2. Soft skills and professional communication, Francis Peters SJ, 1<sup>st</sup>Edition, Mc Graw Hill Education,2011</li> <li>3. Effective communication, John Adair, 4<sup>th</sup>Edition, Pan MacMillan,2009</li> <li>4. Bringing out the best in people, Aubrey Daniels, 2<sup>nd</sup>Edition, Mc Graw Hill,1999</li> <li>5. M.Ashraf Rizvi Effective Technical Communication (Tata McGraw Hill Companies)</li> <li>6. Bhaskaran &amp; Horsburgh Strengthen Your English (Oxford University Press)</li> <li>7. Andrea J Rutherford Basic Communication Skills for Technology (Pearson Education Asia)</li> </ol>

<b>School: Pharmaceutical Sciences</b>	<b>Programme: B.Pharmacy</b>
<b>Year : First Year</b>	<b>Semester - I</b>
<b>Course: Remedial Biology</b>	<b>Course Code:17YBH106</b>
<b>Theory: 2Hrs/Week</b>	<b>Max.University Theory Examination:35 Marks</b>
<b>Max. Time for Theory Exam.:1.5 Hrs</b>	<b>Continuous Internal Assessment: 15 Marks</b>

<b>Objectives</b>	
<b>1</b>	Know the classification and salient features of five kingdoms of life
<b>2</b>	Understand the basic components of anatomy & physiology of plant
<b>3</b>	Know understand the basic components of anatomy & physiology animal with special reference to human

<b>Unit Number</b>	<b>Details</b>	<b>Hours</b>
<b>1</b>	<p><b>Living world:</b></p> <ul style="list-style-type: none"> <li>• Definition and characters of living organisms</li> <li>• Diversity in the living world</li> <li>• Binomial nomenclature</li> </ul> <p>Five kingdoms of life and basis of classification. Salient features of Monera, Protista, Fungi, Animalia and Plantae, Virus,</p> <p><b>Morphology of Flowering plants</b></p> <ul style="list-style-type: none"> <li>• Morphology of different parts of flowering plants – Root, stem, inflorescence, flower, leaf, fruit, seed.</li> <li>• General Anatomy of Root, stem, leaf of monocotyledons &amp; Dicotyledones.</li> </ul>	<b>7</b>
<b>2</b>	<p><b>Body fluids and circulation</b></p> <ul style="list-style-type: none"> <li>• Composition of blood, blood groups, coagulation of blood</li> <li>• Composition and functions of lymph</li> <li>• Human circulatory system</li> <li>• Structure of human heart and blood vessels</li> <li>• Cardiac cycle, cardiac output and ECG</li> </ul> <p><b>Digestion and Absorption</b></p> <ul style="list-style-type: none"> <li>• Human alimentary canal and digestive glands</li> <li>• Role of digestive enzymes</li> <li>• Digestion, absorption and assimilation of digested food</li> </ul> <p><b>Breathing and respiration</b></p> <ul style="list-style-type: none"> <li>• Human respiratory system</li> <li>• Mechanism of breathing and its regulation</li> <li>• Exchange of gases, transport of gases and regulation of respiration</li> </ul> <p>Respiratory volumes</p>	<b>7</b>
<b>3</b>	<b>Excretory products and their elimination</b>	<b>7</b>

	<ul style="list-style-type: none"> <li>• Modes of excretion</li> <li>• Human excretory system- structure and function</li> <li>• Urine formation</li> <li>• Rennin angiotensin system</li> </ul> <p><b>Neural control and coordination</b></p> <ul style="list-style-type: none"> <li>• Definition and classification of nervous system</li> <li>• Structure of a neuron</li> <li>• Generation and conduction of nerve impulse</li> <li>• Structure of brain and spinal cord</li> <li>• Functions of cerebrum, cerebellum, hypothalamus and medulla oblongata</li> </ul> <p><b>Chemical coordination and regulation</b></p> <ul style="list-style-type: none"> <li>• Endocrine glands and their secretions</li> <li>• Functions of hormones secreted by endocrine glands</li> </ul> <p><b>Human reproduction</b></p> <ul style="list-style-type: none"> <li>• Parts of female reproductive system</li> <li>• Parts of male reproductive system</li> <li>• Spermatogenesis and Oogenesis</li> <li>• Menstrual cycle</li> </ul>	
<b>4</b>	<p><b>Plants and mineral nutrition:</b></p> <ul style="list-style-type: none"> <li>• Essential mineral, macro and micronutrients</li> <li>• Nitrogen metabolism, Nitrogen cycle, biological nitrogen fixation</li> </ul> <p><b>Photosynthesis</b></p> <ul style="list-style-type: none"> <li>• Autotrophic nutrition, photosynthesis, Photosynthetic pigments, Factors affecting photosynthesis.</li> </ul>	<b>5</b>
<b>5</b>	<p><b>Plant respiration:</b> Respiration, glycolysis, fermentation (anaerobic).</p> <p><b>Plant growth and development</b></p> <ul style="list-style-type: none"> <li>• Phases and rate of plant growth, Condition of growth, Introduction to plant growth regulators</li> </ul> <p><b>Cell - The unit of life</b></p> <ul style="list-style-type: none"> <li>• Structure and functions of cell and cell organelles. Cell division</li> </ul> <p><b>Tissues</b></p> <ul style="list-style-type: none"> <li>• Definition, types of tissues, location and functions.</li> </ul>	<b>4</b>
<b>Total</b>		<b>30</b>

<b>Resources</b>	
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1. A Text book of Biology by S. B. Gokhale</li> <li>2. A Text book of Biology by Dr. Thulajappa and Dr.Seetaram.</li> </ol>
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. A Text book of Biology by B.V. Sreenivasa Naidu</li> <li>2. A Text book of Biology by Naidu and Murthy</li> <li>3. Botany for Degree students By A.C.Dutta.</li> <li>4. Outlines of Zoology by M. Ekambaranatha ayyer and T. N. Ananthkrishnan.</li> <li>5. A manual for pharmaceutical biology practical by S.B. Gokhale and C. K.Kokate</li> </ol>

<b>School: Pharmaceutical Sciences</b>	<b>Programme: B.Pharmacy</b>
<b>Year : First Year</b>	<b>Semester - I</b>
<b>Course: Remedial Mathematics – Theory</b>	<b>Course Code:17YBH107</b>
<b>Theory: 2Hrs/Week</b>	<b>Max.University Theory Examination:35 Marks</b>
<b>Max. Time for Theory Exam.:1.5 Hrs</b>	<b>Continuous Internal Assessment: 15 Marks</b>
<b>Objectives</b>	
<b>1</b>	Know the theory and their application in Pharmacy
<b>2</b>	Solve the different types of problems by applying theory
<b>3</b>	Appreciate the important application of mathematics in Pharmacy

<b>Unit Number</b>	<b>Details</b>	<b>Hours</b>
<b>1</b>	<p>• <b>Partial fraction</b> Introduction, Polynomial, Rational fractions, Proper and Improper fractions, Partial fraction , Resolving into Partial fraction, Application of Partial Fraction in Chemical Kinetics and Pharmacokinetics</p> <p>• <b>Logarithms</b> Introduction, Definition, Theorems/Properties of logarithms, Common logarithms, Characteristic and Mantissa, worked examples, application of logarithm to solve pharmaceutical problems.</p> <p>• <b>Function:</b> Real Valued function, Classification of real valued functions,</p> <p>• <b>Limits and continuity :</b> Introduction , Limit of a function, Definition of limit of function definition),</p> $\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a} = na^{n-1}, \quad \lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1,$	<b>6</b>
<b>2</b>	<p>• <b>Matrices and Determinant:</b> Introduction matrices, Types of matrices, Operation on matrices, Transpose of a matrix, Matrix Multiplication, Determinants, Properties of determinants , Product of determinants, Minors and co-Factors, Adjoint or adjugate of a 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 Matrices involving Pharmacokinetic equations</p>	<b>6</b>
<b>3</b>	<p>• <b>Calculus</b> <b>Differentiation :</b> 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) –</p>	<b>6</b>

	<b>Without Proof</b> , Derivative of $x^n$ w.r.t.x, where n is any rational number, Derivative of $e^x$ , Derivative of $\log_e x$ , Derivative of $a^x$ , Derivative of trigonometric functions from first principles ( <b>without Proof</b> ), Successive Differentiation, Conditions for a function to be a maximum or a minimum at a point. Application	
<b>4</b>	<ul style="list-style-type: none"> <li>• <b>Analytical Geometry</b>  <b>Introduction:</b> Signs of the Coordinates, Distance formula,  <b>Straight Line</b> : Slope or gradient of a straight line, Conditions for parallelism and perpendicularity of two lines, Slope of a line joining two points, Slope – intercept form of a straight line  <b>Integration:</b>  Introduction, Definition, Standard formulae, Rules of integration, Method of substitution, Method of Partial fractions, Integration by parts, definite integrals, application</li> </ul>	<b>6</b>
<b>5</b>	<ul style="list-style-type: none"> <li>• <b>Differential Equations</b> : Some basic definitions, Order and degree, Equations in separable form, Homogeneous equations, Linear Differential equations, Exact equations, <b>Application in solving Pharmacokinetic equations</b></li> <li>• <b>Laplace Transform</b> : Introduction, Definition, Properties of Laplace transform, Laplace Transforms of elementary functions, Inverse Laplace transforms, Laplace transform of derivatives, Application to solve Linear differential equations, <b>Application in solving Chemical kinetics and Pharmacokinetics equations</b></li> </ul>	<b>6</b>
<b>Total</b>		<b>30</b>

### Resources

<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1. Differential Calculus by Shanthinarayan</li> <li>2. Pharmaceutical Mathematics with application to Pharmacy by Panchaksharappa Gowda D.H.</li> <li>3. Integral Calculus by Shanthinarayan</li> <li>4. Higher Engineering Mathematics by Dr.B.S.Grewal</li> </ol>
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<b>School: Pharmaceutical Science</b>	<b>Programme: Bachelor of pharmacy(B.Pharm.)</b>
<b>Year: First Year</b>	<b>Semester - I</b>
<b>Course: Human Anatomy and Physiology –I Practical</b>	<b>Course Code: 17YBH111</b>
<b>Practical: 4 Hrs./Batch (20 Students)</b>	<b>Max.University Practical Examination:35 Marks</b>
	<b>Continuous Internal Assessment: 15 Marks</b>

<b>Objectives</b>	
1	Explain correct use and handling of various materials, instruments and equipments
2	Clarify structural and microscopical aspects of various organs of human system.
3	Demonstrate and aware the students related various parameters used to check and regulate the normal functions of Human body
4	Demonstrate with the techniques for identification and determination of various integral components of the body

<b>Sr. No.</b>	<b>Description</b>
1	Study of compound microscope.
2	Microscopic study of epithelial and connective tissue
3	Microscopic study of muscular and nervous tissue
4	Identification of axial bones
5	Identification of appendicular bones
6	Introduction to hemocytometry
7	Enumeration of white blood cell (WBC) count
8	Enumeration of total red blood corpuscles (RBC) count
9	Determination of bleeding time
10	Determination of clotting time
11	Estimation of hemoglobin content
12	Determination of blood group.
13	Determination of erythrocyte sedimentation rate (ESR).
14	Determination of heart rate and pulse rate.
15	Recording of blood pressure

<b>Practical/Oral/Presentation:</b>
Practical/Oral/Presentation shall be conducted and assessed jointly by internal and external examiners. The performance in the Practical/Oral/Presentation examination shall be assessed by at least a pair of examiners appointed as examiners by the University. The examiners will prepare the mark/grade sheet in the format as specified by the University, authenticate and seal it. Sealed envelope shall be submitted to the head of the department or authorized person.

<b>School: Pharmaceutical Science</b>	<b>Programme: Bachelor of pharmacy(B.Pharm.)</b>
<b>Year: First Year</b>	<b>Semester - I</b>
<b>Course: Pharmaceutical Analysis I – Practical</b>	<b>Course Code: 17YBH112</b>
<b>Practical: 4 Hrs./Batch (20 Students)</b>	<b>Max.University Practical Examination:35 Marks</b>
	<b>Continuous Internal Assessment: 15 Marks</b>

<b>Objectives</b>	
1	Clarify and understand the correct use of laboratory equipments used in Analytical Chemistry laboratory together with safety measures to be followed.
2	Develop practical hand in titrimetric analysis by estimation of analyte concentration in pure form and in formulation with thorough understanding of principle and procedure used in different titration methods such as aqueous, non-aqueous, precipitation, complexometric, redox titration methods
3	Carryout various volumetric and electrochemical titrations to determine normality.

<b>Sr. No.</b>	<b>Description</b>
<b>1</b>	<b>Preparation and standardization of</b> (1) Sodium hydroxide (2) Sulphuric acid (3) Sodium thiosulfate (4) Potassium permanganate (5) Ceric ammonium sulphate
<b>2</b>	<b>Assay of the following compounds along with Standardization of Titrant</b> (1) Ammonium chloride by acid base titration (2) Ferrous sulphate by Cerimetry (3) Copper sulphate by Iodometry (4) Calcium gluconate by complexometry (5) Hydrogen peroxide by Permanganometry (6) Sodium benzoate by non-aqueous titration (7) Sodium Chloride by precipitation titration
<b>3</b>	<b>Determination of Normality by electro-analytical methods</b> (1) Conductometric titration of strong acid against strong base (2) Conductometric titration of strong acid and weak acid against strong base (3) Potentiometric titration of strong acid against strong base

<b>Practical/Oral/Presentation:</b>
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<b>School: Pharmaceutical Science</b>	<b>Programme: Bachelor of pharmacy(B.Pharm.)</b>
<b>Year: First Year</b>	<b>Semester - I</b>
<b>Course: Pharmaceutics I – Practical</b>	<b>Course Code: 17YBH113</b>
<b>Practical: 4 Hrs./Batch (20 Students)</b>	<b>Max.University Practical Examination:35 Marks</b>
	<b>Continuous Internal Assessment: 15 Marks</b>

<b>Objectives</b>	
1	State the correct use of various equipments in Pharmaceutics laboratory relevant to practical
2	Describe use of ingredients in formulation and category of formulation.
3	Explain formulation, evaluation and labeling of powders, granules, emulsion, suspension, ointments and liquid preparations
4	Define and describe the physical characteristics and role of formulation aids in preparation of pharmaceutical
5	Perform pharmaceutical calculations & summarize the principles of formulation and evaluation.
6	Predict the special requirements of preparations regarding the use, handling, storage conditions.
7	Draw the labels in neat way including all the component/parts

<b>Sr. No.</b>	<b>Description</b>
1	<b>Syrups</b>
	a) Syrup IP'66
	b) Compound syrup of Ferrous Phosphate BPC'68
2	<b>Elixirs</b> a) Piperazine citrate elixir
	b) Paracetamol pediatric elixir
3	<b>Linctus</b> a) Terpin Hydrate Linctus IP'66
4	<b>Solutions</b>
	b) Iodine Throat Paint (Mandles Paint)
	a) Strong solution of ammonium acetate
	b) Cresol with soap solution
	c) Lugol's solution
5	<b>Suspensions</b>
	a) Calamine lotion
	b) Magnesium Hydroxide mixture
	c) Aluminium Hydroxide gel
6	<b>Emulsions</b> a) Turpentine Liniment
	b) Liquid paraffin emulsion
7	<b>Powders and Granules</b>
	a) ORS powder (WHO)
	b) Effervescent granules
	c) Dusting powder
	d) Divided powders
8	<b>Suppositories</b>
	a) Glycerol gelatin suppository

	b) Cocoa butter suppository
	c) Zinc Oxide suppository
9	<b>Semisolids</b>
	a) Sulphur ointment
	b) Non staining-iodine ointment with methyl salicylate
	c) Carbopal gel
10	<b>Gargles and Mouthwashes</b>
	a) Iodine gargle
	b) Chlorhexidine mouthwash

**Practical/Oral/Presentation:**

Practical/Oral/Presentation shall be conducted and assessed jointly by internal and external examiners. The performance in the Practical/Oral/Presentation examination shall be assessed by at least a pair of examiners appointed as examiners by the University. The examiners will prepare the mark/grade sheet in the format as specified by the University, authenticate and seal it. Sealed envelope shall be submitted to the head of the department or authorized person.

<b>School: Pharmaceutical Science</b>	<b>Programme: Bachelor of pharmacy(B.Pharm.)</b>
<b>Year: First Year</b>	<b>Semester - I</b>
<b>Course: Pharmaceutical Inorganic Chemistry – Practical</b>	<b>Course Code: 17YBH114</b>
<b>Practical: 4 Hrs./Batch (20 Students)</b>	<b>Max.University Practical Examination:35 Marks</b>
	<b>Continuous Internal Assessment: 15 Marks</b>

<b>Objectives</b>	
1	Explain method of manufacturing, physical/chemical properties, assay, storage and uses of important inorganic substances used for pharmaceutical purpose.
2	Prepare and calculate theoretical, practical and percentage yield of inorganic pharmaceutical compounds
3	Identify impurities from pharmaceutical substances by performing limit tests
4	Predict swelling power, acid neutralizing capacity of various inorganic compounds.

<b>Sr. No.</b>	<b>Description</b>
1	<b>Limit tests for following ions</b> 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
2	<b>Identification test</b> Magnesium hydroxide Ferrous sulphate Sodium bicarbonate Calcium gluconate Copper sulphate
3	<b>Test for purity</b> Swelling power of Bentonite Neutralizing capacity of aluminum hydroxide gel Determination of potassium iodate and iodine in potassium Iodide
4	<b>Preparation of inorganic pharmaceuticals</b> Boric acid Potash alum Ferrous sulphate

<b>Practical/Oral/Presentation:</b>
Practical/Oral/Presentation shall be conducted and assessed jointly by internal and external examiners. The performance in the Practical/Oral/Presentation examination shall be assessed by at least a pair of examiners appointed as examiners by the University. The examiners will prepare the mark/grade sheet in the format as specified by the University, authenticate and seal it. Sealed envelope shall be submitted to the head of the department or authorized person.

<b>School: Pharmaceutical Science</b>	<b>Programme: Bachelor of pharmacy(B.Pharm.)</b>
<b>Year: First Year</b>	<b>Semester - I</b>
<b>Course: Communication skills – Practical</b>	<b>Course Code: 17YBH115</b>
<b>Practical: 2 Hrs./Batch (20 Students)</b>	<b>Max.University Practical Examination: 15 Marks</b>
	<b>Continuous Internal Assessment: 10 Marks</b>

<b>Objectives</b>	
1	Handle interpersonal relations & communicate effectively
2	Choose career and make appropriate decisions
3	Build a repertoire of functional vocabulary and to move from the lexical level to the syntactic level
4	Comprehend the concept of communication
5	Describe the four basic communication skills – Listening, Speaking, Reading and Writing
6	Convert the conceptual understanding of communication into everyday practice
7	Become aware of their thinking styles and to enable them to convert thinking into performance
8	Make students reflect and improve their use of body language – posture, gesture, facial expression, tone
9	Identify, classify and apply relevant soft skills.
10	Identify the concept and components of personality, thereby to apply the acquired knowledge to themselves and to march towards excellence in their respective academic careers.
11	Bring out creativity and other latent talents with proper goal setting so that self- esteem gets enhanced
12	Identify the concept of positive thinking which will keep the students in a good stead at the time of crisis.

<b>Sr. No.</b>	<b>Description</b>
	The following learning modules are to be conducted using words worth® English language lab software
1	<b>Basic communication covering the following topics</b>
	Meeting People
	Asking Questions
	Making Friends
	What did you do?
	Do's and Dont's
2	<b>Pronunciations covering the following topics</b>
	Pronunciation (Consonant Sounds)
	Pronunciation and Nouns
	Pronunciation (Vowel Sounds)
3	<b>Advanced Learning</b>
	Listening Comprehension / Direct and Indirect Speech
	Figures of Speech
	Effective Communication
	Writing Skills

	Effective Writing
	Interview Handling Skills
	E-Mail etiquette
	Presentation Skills

**Practical/Oral/Presentation:**

Practical/Oral/Presentation shall be conducted and assessed jointly by internal and external examiners. The performance in the Practical/Oral/Presentation examination shall be assessed by at least a pair of examiners appointed as examiners by the University. The examiners will prepare the mark/grade sheet in the format as specified by the University, authenticate and seal it. Sealed envelope shall be submitted to the head of the department or authorized person.

<b>School: Pharmaceutical Science</b>	<b>Programme: Bachelor of pharmacy(B.Pharm.)</b>
<b>Year: First Year</b>	<b>Semester - I</b>
<b>Course: Remedial Biology – Practical</b>	<b>Course Code:17YBH116</b>
<b>Practical: 2 Hrs./Batch (20 Students)</b>	<b>Max.University Practical Examination: 15 Marks</b>
	<b>Continuous Internal Assessment: 10 Marks</b>

<b>Objectives</b>	
1	Able to prepare permanent slides & explain the significance of reference material such as herbarium specimen, permanent slides etc. In plant authentication
2	Demonstrate skill of plant material sectioning, staining, mounting & focusing
3	Decide on staining reagents required for specific part of plant
4	Understand the basic components of anatomy & physiology of animal with special reference to human
5	Understand the basic components of anatomy & physiology of plant.
6	Learn the techniques of determination of blood group, blood pressure & tidal volume

<b>Sr. No.</b>	<b>Description</b>
1	Introduction to experiments in biology a) Study of Microscope b) Section cutting techniques c) Mounting and staining d) Permanent slide preparation
2	Study of cell and its inclusions
3	Study of Stem, Root, Leaf and its modifications
4	Detailed study of frog by using computer models
5	Microscopic study and identification of tissues
6	Identification of bones
7	Determination of blood group
8	Determination of blood pressure
9	Determination of tidal volume

<b>Practical/Oral/Presentation:</b>
Practical/Oral/Presentation shall be conducted and assessed jointly by internal and external examiners. The performance in the Practical/Oral/Presentation examination shall be assessed by at least a pair of examiners appointed as examiners by the University. The examiners will prepare the mark/grade sheet in the format as specified by the University, authenticate and seal it. Sealed envelope shall be submitted to the head of the department or authorized person.