

GANPAT UNIVERSITY																			
FACULTY OF PHARMACY																			
TEACHING AND EXAMINATION SCHEME																			
Programme	Bachelor of Pharmacy				Branch/Spec.	B.Pharm.													
Semester	I																		
Effective from Academic Year	2015-16			Effective for the batch Admitted in	June 2015														
Subject Code	Subject Name	Teaching scheme											Examination scheme (Marks)						
		Credit						Hours (per week)					Theory			Practical			
		Lecture(DT)			Practical (Lab.)			Lecture(DT)			Practical(Lab.)		CE	SEE	Total	CE	SEE	Total	
		L	TU	Total	P	TW	Total	L	TU	Total	P	TW							Total
BPH1A1	Pharmaceutical Unit Operation-I	3	-	3	2	2	3	-	3	3	1	4	40	60	100	40	60	100	
BPH1A2	Pharmaceutical Engineering-I	3	-	3	2	2	3	-	3	3	1	4	40	60	100	40	60	100	
BPH1A3	Physical Chemistry	3	-	3	2	2	3	-	3	3	1	4	40	60	100	40	60	100	
BPH1A4	Anatomy Physiology and Health Education-I	4	-	4	2	2	4	-	4	3	1	4	40	60	100	40	60	100	
BPH1B5	Communication and Soft skills	2	-	2	2	2	2	-	2	3	1	4	40	60	100	40	60	100	
Total		15	-	15	10	10	15	-	15	15	5	20	200	300	500	200	300	500	

GANPAT UNIVERSITY									
FACULTY OF PHARMACY									
Programme	Bachelor of Pharmacy				Branch/Spec.	B.Pharm.			
Semester	I				Version	2.0.0.0			
Effective from Academic Year	2015-16				Effective for the batch Admitted in	June 2015			
Subject code	BPH1A1		Subject Name		Pharmaceutical Unit Operation-I				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total	CE	SEE	Total	
	L	TU	P	TW					
Credit	3	-	2		2	Theory	40	60	100
Hours	3	-	3	1	4	Practical	40	60	100
Pre-requisites:									
Nil									
Learning Outcome:									
<ul style="list-style-type: none"> By the end of this course, the student will have a good understanding of the basic concepts of clarification and purification of solid and liquid raw materials in pharmacy. Students familiarize on appropriate instrumental requirement for different types of unit operations used in pharmaceutical industries. 									
Theory syllabus									
Unit	Content							Hrs	
1	Filtration: Theory and mechanism of filtration process, factors affecting rate of filtration, filter media, filter aids, types of filters, operation of filters, industrial filters-leaf filter, filter press, rotary filter, edge filters, cartridge filters, membrane filters, optimum cleaning cycle in batch filters, etc., application in pharmacy.							08	
2	Centrifugation: Principle and theory of centrifugation, industrial centrifuges-perforated basket centrifuge, sedimentation type centrifuge, continuous centrifuges etc. Applications in pharmacy.							04	
3	Evaporation: Basic concept of phase equilibria, factors affecting evaporation, heat transfer in evaporators, Duhring's Rule and Raoult's law, evaporators- natural circulation forced circulation & film evaporators, single effect and multiple effect evaporators.							08	
4	Distillation: Physical concepts, vapour liquid equilibrium relationship, volatility & relative volatility, simple steam and flash distillations, batch and continuous distillation, rectification, distillation columns (packed, plate) and their efficiency, McCabe Thiele method for calculation of number of theoretical plates, azeotropic, molecular & steam distillation, mathematical problems.							08	
5	Drying: Principle, Moisture content, loss on drying, theory & mechanism of drying, drying rate and time calculations, classification of dryers, factors affecting selection of dryers, dryers used in pharmaceutical industries - tray, vacuum, fluidized bed, flash, tunnel, Microwave, rotary dryers.							09	
6	HVAC(Humidity Ventilation and Air Conditioning): Definitions of various terms, wet bulb and adiabatic saturation temperatures, psychometric chart and determination of humidity, equipments for humidification and de-humidification operations, applications of humidity control in various pharmaceutical processes. Basic concepts and types of refrigeration cycles, air conditioning, applications in pharmacy. Design of HVAC systems.							08	

Practical content	
Practicals related to topics in theory shall be carried out such as filtration, factors affecting rate of filtration, centrifugation, evaporation, rectification, distillation and drying.	
Text Books	
1	Tutorial Pharmacy by Cooper & Gunn, ed. S.J.Carter, CBS Publishers & Distributors, Delhi, 6th Edition, 2000.
2	Pharmaceutics the Science of Dosage Form Design; M.E. Aulton; Churchill Livingstone, London, 2002.
3	The Theory & Practice of Industrial Pharmacy – Lachman L., Lieberman H.A. & Kanjig J.L., 3rd edition, Varghese Publishing House, Bombay, 1991.
4	Pharmaceutics II (Unit Operations) by G. K. Jani, B. S. Shah Prakashan, Ahmedabad, 2002.
5	Bentley's Textbook of Pharmaceutics; Rawlins E A; AITBS Pub & Dist Delhi, 2004.
Reference Books	
1	Elementary Chemical Engineering - Max S. Peters, Published by McGraw Hill Book Company, New York, 1954.
2	Perry's Chemical Engineer's Handbook - Robert H Perry, Green D.W., Maloney J.O. 7th Edition, McGraw – Hill Inc., New York, 1998.
3	Unit Operations of Chemical Engineering, 5th edition – McCabe, Smith & Harriott, McGraw – Hill Inc., New York, 2001.
4	Remington: The Science and Practice of Pharmacy; Gennaro A.R.; Lippincott Williams & Wilkins, Philadelphia; 2004.

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Semester	I				Version	2.0.0.0			
Effective from Academic Year	2015-16				Effective for the batch Admitted in	June 2015			
Subject code	BPH1A2		Subject Name		Pharmaceutical Engineering-I				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total	CE	SEE	Total	
	L	TU	P	TW					
Credit	3	-	2		2	Theory	40	60	100
Hours	3	-	3	1	4	Practical	40	60	100
Pre-requisites:									
Nil									
Learning Outcome:									
<ul style="list-style-type: none"> By the end of this course, students will acquire understanding of the basic concepts of material handling, material transfer and heat transfer in the field of pharmacy. Students shall aware of appropriate instrumental requirements for fluid flow and shifting of solid material. 									
Theory syllabus									
Unit	Content							Hrs	
1	Introduction: Pharmaceutical engineering and its significance, unit operations and unit processes. Unit systems, SI unit, CgS unit, gas constant and conversion of units. Physical quantities, dimensions and units, dimensional equations, dimensional analysis and dimensionless groups. Different types of graphical representation.							03	
2	Stoichiometry: General principles, material balance-tie substances, chemical reactions and molal units, rate process, steady, unsteady and equilibrium state, fuels and combustion, etc., Mathematical problems.							05	
3	Fluid Flow: Type of steady flow, Reynold number & its significance, , concept of viscosity and boundary layers, total energy balance and total mechanical energy balance, losses in mechanical energy of fluids, basic equations of fluid flow, valves, flow meters, manometers. Measurement of flow and pressure. Mathematical problems.							10	
4	Material handling systems: Solids handling- storage, conveyers, vacuum & pneumatic conveying. Liquid handling storage, pumps Gases- Fans, blowers and compressors. Colour coding of Pipelines, use of forklifts and pallets, store design in pharmaceutical industries.							09	
5	Heat Transfer: Modes of heat transfer. Conduction- Fourier's law, resistances in series and parallel, use of mean area and mean temperature difference. Convection-Concept of film, overall coefficient. Radiation-Black body, absorptivity & emissivity. Heat exchangers and condensers. Applications of heat transfer in industrial processes. Mathematical problems.							05	
6	Mass Transfer: Principle, streams in mass-transfer operations, solid/fluid and fluid/fluid mass transfer, influence of mass transfer on unit operations.							02	
7	Materials of Pharmaceutical Plant Construction: General study of composition, corrosion resistance, properties, factors affecting the selection of material of pharmaceutical plant construction with special reference to stainless steel and glass. Corrosion-types, causes, theories of corrosion and its prevention.							08	

8	Gas Absorption: Introduction, equipments and overall mass transfer coefficient. Applications of gas absorption in industrial processes.	03
Practical content		
Practicals related to topics in pharmaceutical engineering theory shall be carried out. Experiments to demonstrate stoichiometry and tie substances in chemical reactions, Study of various flow meters and ejector pump, Experiment on Reynolds number, Determination of overall heat transfer coefficient and Demonstration of corrosion resistance of various materials.		
Text Books		
1	Tutorial Pharmacy by Cooper & Gunn, ed. S.J.Carter, CBS Publishers & Distributors, Delhi, 6th Edition, 2000.	
2	Pharmaceutical Engineering; K. Sambamurthy; New Age International Ltd., New Delhi 2002.	
3	Pharmaceutics I (Pharmaceutical Engineering), Jani G. K., B. S. Shah Prakashan, Ahmedabad, 2002.	
4	Pharmaceutical Engineering: Principles and Practice, Subramanyam C.V.S., Thimma J, Suresh S.S. et. al., VallabhPrakashan, Delhi, 2002.	
Reference Books		
1	Elementary Chemical Engineering - Max S. Peters, Published by McGraw Hill Book Company, New York, 1954.	
2	Perry's Chemical Engineer's Handbook - Robert H Perry, Green D.W., Maloney J.O. 7th Edition, McGraw – Hill Inc., New York., 1998.	
3	Unit Operations of Chemical Engineering, 5th edition - McCabe, Smith & Harriott, McGraw – Hill Inc., New York, 2001.	
4	Pharmaceutics the Science of Dosage Form Design; M.E. Aulton; Churchill Livingstone, London; 2002.	

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Programme		Bachelor of Pharmacy			Branch/Spec.		B.Pharm.		
Semester		I			Version		2.0.0.0		
Effective from Academic Year			2015-16		Effective for the batch Admitted in			June 2015	
Subject code		BPH1A3	Subject Name		Physical Chemistry				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	-	2		2	Theory	40	60	100
Hours	3	-	3	1	4	Practical	40	60	100
Pre-requisites:									
Nil									
Learning Outcome:									
<ul style="list-style-type: none"> By the end of this course, the students have understanding of basic concepts of physical chemistry. Students able to understand principles of states of matter, aqueous solutions, thermodynamics, chemical catalysis and their applications. 									
Theory syllabus									
Unit	Content								Hrs
1	Behavior of Gases: Gas laws, Ideal gas equation, Kinetic theory of gases, Deviation from ideal behavior and explanations.								06
2	The liquid state: Physical properties such as Surface tension, Parachor, Viscosity, Refractive index, Optical rotation, Dipole moment of chemical constituents.								06
3	Solutions: Ideal and real solutions, Colligative properties, Partition co-efficient, Conductance and its measurement, Debye-Huckel theory.								08
4	Adsorption: Basic principles, Freundlich and Gibbs adsorption isotherms, Langmuir theory of adsorption, Pharmaceutical applications.								04
5	Photochemistry: Basic principles, Consequence of light absorption, Jablonski diagram, Lambert-Beer Law, Quantum efficiency.								05
6	Thermodynamics: Basic principles, First, second and third laws, Zeroth Law, Absolute temperature scale, Thermochemical equations, Phase equilibria and phase rule, One and two component systems.								08
7	Chemical kinetics: Zero, first and second orders reactions, Complex reaction, Theories of reaction kinetics, Characteristics of homogeneous and heterogeneous catalysts, Acid-base enzyme catalysis.								08
Practical content									
Experiments based on surface tension and viscosity measurement, partition coefficient between two systems and adsorption, order of reaction (First and Second), refractive index and molar refraction etc.									
Text Books									
1	Essential of Physical Chemistry; B.S. Bhal, G.D. Tuli and ArunBhal, S. Chand and Company Ltd., Latest edition.								
2	Practical physical chemistry, Viswanathan B., Raghavan P. S., Viva books pvt. Ltd., 2005.								
3	Text book of Physical Chemistry; Samuel Glasstone, Macmillan India Limited, 2 nd Ed. 1995.								
4	Text book of pure and applied Physical Chemistry; Bhatnagar M. S., Wheeler publishing, 1 st Ed. 1999.								
5	Advanced Physical Chemistry, Gurdeep Raj, Goel Publishing House; 20 th Ed. 1996.								

Reference Books	
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1	Physical chemistry, Vemulapalli G. K., Prentice-hall of india pvt. Ltd., New Delhi, Latest edition.
2	Advanced Physical Chemistry, Gutru J. N. Pragati Prakashan, Meerut, Latest edition.
3	Elements of physical Chemistry; Peter Atkins, Julio De Paula, Oxford University Press, 4 th Ed. 2007.

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FACULTY OF PHARMACY									
Programme	Bachelor of Pharmacy				Branch/Spec.	B.Pharm.			
Semester	I				Version	2.0.0.0			
Effective from Academic Year	2015-16				Effective for the batch Admitted in	June 2015			
Subject code	BPH1A4		Subject Name		Anatomy Physiology and Health Education-I				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total	CE	SEE	Total	
	L	TU	P	TW					
Credit	4	-	2		2	Theory	40	60	100
Hours	4	-	3	1	4	Practical	40	60	100
Pre-requisites:									
Nil									
Learning Outcome:									
<ul style="list-style-type: none"> At the end of course, student will discover how the body regulates its own internal environment called homeostasis and helps for basic understanding in students in a way that is understood by scientists and health-care professionals alike. At the end of semester students should be confident to perform haematological experiments and interpret their results. 									
Theory syllabus									
Unit	Content							Hrs	
1	Introduction and Scope of Anatomy and Physiology. Structural and functional organization of various organ systems. Control of homeostasis, Negative and positive feedback system. Transcellular, Extra-cellular and Intra-cellular fluids and their composition. Serosal cavities. Definitions of various terms used in Anatomy.							04	
2	Structure and function of cell and its components with Special emphasis on molecular structure of cell membrane, transporter mechanisms, mitochondria and nucleus. Cell cycle and its significance. Mechanism of protein synthesis by cell organelles.							06	
3	Elementary tissues of the body: Various elementary tissues and their subtypes with characteristics, location and functions: epithelial tissue, muscular tissue, connective tissue and nervous tissue.							04	
4	Osseous system: Structure and function of skeleton. Histology of bone. Classification of joints and their function. Types of movements of joints. Brief introduction to disorders of bones and joints.							04	
5	Muscular system: Gross anatomy of skeletal muscles. Names, position, attachments and functions of various muscles. Neuromuscular junction. Physiology of muscle contraction and its components. Properties of skeletal muscles and their significance in health disorders.							05	
6	Haemopoietic system: Introduction, composition, properties and functions of blood and its components. Haemopoiesis Lifecycle and physiology of RBC. Blood groups and their significance. Hemostasis and fibrinolytic pathway. Types of Anemia. Brief information regarding disorders of blood.							09	
7	Lymph and lymphatic system: Composition, formation, circulation and functions of lymph. Basic physiology of spleen. Disorders associated to lymph and lymphatic system.							03	
8	Body defense Mechanisms & Immunity: Basic principles of immunity, innate immunity, adaptive immunity, acquired immunity, immune interactions (cellular and humoral immunity).							04	

9	Digestive system; Gross Anatomy of the Gastrointestinal tract. Structure and functions of various organs of alimentary canal and associated organs like Liver, pancreas and gall bladder. Physiology of digestion and absorption in various parts of gastrointestinal tract including phases of gastric secretion. Brief overview of disorders of G. I. tract and associated organs.	06
10	Urinary System: Anatomy of kidneys, nephron and functions of renal system. Overview of renal physiology, glomerular filtration, tubular reabsorption, tubular secretion, formation of urine. Functions of ureter, urinary bladder and urethra. Overview of Acid Base balance. Brief outline of renal disease conditions i.e. renal calculi, renal infection, renal failure and glomerular disease.	06
11	Endocrine System: Role of Endocrine Glands in Regulation and Integration of various functions of the Body, Anatomy and Physiology of pituitary gland, thyroid, parathyroid, adrenals, Pancreas, testes and ovary, their hormones and functions with brief outlines of their disorders.	09

Practical content

- Study of the human skeleton and joints with help of charts and models.
- Study with the Digestive system, Muscular System and organs with help of charts and models.
- Histology of elementary tissues and organs of alimentary canal and associated organs.
- Haematology experiments, Use & Care of Microscope, Study of Haemocytometry, Hemoglobin estimation, Total WBC count, Total RBC count, Differential WBC count, Determination of clotting time and bleeding time of blood, Erythrocyte sedimentation rate (ESR) and Blood Groups, Effect of Osmosis on RBC.
- Amphibian experiments for study of properties of skeletal muscle using either demonstrations or computer simulated experiments.

Text Books

1	Derasari and Gandhi's Elements of Human Anatomy, Physiology & Health Education Eds R. K. Goyal et al. (B.S. Shah Prakashan, Ahmedabad).
2	Chatterjee C.C. Human Physiology (Medical Allied Agency, Calcutta).
3	Goyal R.K. et al.: Practical Anatomy Physiology and Biochemistry (B.S. Shah Prakashan, Ahmedabad).
4	Garg K. et al. A Text Book of Histology (CBS Publishers, New Delhi).

Reference Books

1	Guyton A.C. and Hall J.E.: Textbook of Medical Physiology – 11 th Edition– W.B. Saunders, Philadelphia.
2	Tortora G.J. and Bryan Derrickson, Principles of Anatomy and Physiology, 12 th Edition, John Willey & Sons, USA.
3	Waugh A. and Grant A.: Ross and Wilson's Anatomy and Physiology in Health & illness, 9 th Edition- Churchill Livingstone.
4	Anne M.R. Agur & Ming J. Lee: Grant's Atlas of Anatomy –Lippincott, Williams and Wilkins.
5	Martini, F. Fundamentals of Anatomy and Physiology (Prentice Hall).
6	West, J.B. Best and Taylor's physiological Basis of Medical Practice (Williams and Wilkins, Baltimore).
7	William J. Larsen: Anatomy: Development Function Clinical Correlation – Saunders (Elsevier Science).

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Programme	Bachelor of Pharmacy				Branch/Spec.	B.Pharm.			
Semester	I				Version	2.0.0.0			
Effective from Academic Year	2015-16				Effective for the batch Admitted in	June 2015			
Subject code	BPH1A5		Subject Name		Communication and Soft Skills				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total	CE	SEE	Total	
	L	TU	P	TW					
Credit	2	-	2		2	Theory	40	60	100
Hours	2	-	3	1	4	Practical	40	60	100
Pre-requisites:									
Nil									
Learning Outcome:									
<ul style="list-style-type: none"> By the end of this course, the students learn the effective concepts of communication, aware of utilization of IT and Media for Communication. They shall able to exhibit their positive personality on different occasions in business or work place. They should have good command on Listening, Speaking, Reading and Writing. 									
Theory syllabus									
Unit	Content							Hrs	
1	Introduction to Communication Introduction to Communication, Cycle of Communication, Importance of Effective Communication, Verbal and non-verbal communication, 7 Cs of Communication, Principles of communication							05	
2	IT and Media of Communication Telex, Facsimile, Email, Voicemail, Internet Multimedia, Teleconferencing , Video Conferencing, SMS, Telephone Answering Machine, Conventional Medias, Medias of Mass Communication							05	
3	Communication for administration of Personal Department Types of Application Letter- Solicited and Unsolicited application Letters, Form and content of an Application Letter, Forming Resume and CV, Interview Letter, Reference Letter, Testimonial Letter, Letter of appointment, Letter of Confirmation, Letter of Promotion, Letter of Retirement, Letter of Resignation, Leave Application							05	
4	Listening Skills The Listening Process, Hearing Vs Listening, Types of Listening, Modes of Listening, Barriers to Listening, Effective Listening Strategies							05	
5	Presentation Skills Nature and Importance of Oral Presentation, Planning the Presentation, Preparing the Presentation, Organizing your Presentation, Rehearsing the Presentation, Improving Delivery Checklist for Making an Oral Presentation, Body Language							05	
6	Corporate etiquettes, Mannerism and Grooming Introduction to etiquette, Benefits of etiquettes, Office etiquettes, Email etiquettes, Telephonic etiquettes, Dining etiquettes, Business meeting etiquettes, Personal Behavior and Grooming							05	
Practical content									
Practicals based on followings.									
Listening: Understanding Number and Alphabet, Listening for Description, Frequency, Similar Meaning Listening for explanation, Classification, Comparison and contrast Negative Meaning and Chronology									
Speaking: Chit/Card Method (Any one from the listed topics)									

My Village/Town/City, My Family, My Favourite Actor/Actress, The Movie I like most, My hero in my life, My favourite TV Serial, My College, My School Days, Tourist Place I last Visited, My Aim in my Life

Reading: Three reading passages for 40 Questions (Skimming, Scanning, Intensive Reading, Topic Sentence and its Role, Using first Paragraph for prediction etc. techniques to be introduced). Three reading passages for 40 Questions (Skimming, Scanning, Intensive Reading, Topic Sentence and its Role, Using first Paragraph for prediction etc. techniques to be introduced)

Writing: Describing a Chart, Graph, Object, Give an opinion on a subject or propose a solution to a problem, Write a letter asking an assistance with a subject.

Text Books

1	Alex K., Soft Skills Know the world and Know Yourself, Sultan Chand and Sons, New Delhi
2	Rizvi A. Effective Technical Communication – Tata McGraw-Hill Education Private Limited, Delhi
3	Raman M. and Sharma S., Technical Communication, Oxford University Press, New Delhi
4	Rai U and Rai S, Business Communication, Himalaya Publishing House

Reference Books

1	Cambridge IELTS, Cambridge University Press – Book 1 to 8
2	Lougheed L., IELTS, Barron's