

NOTIFICATION – 01/32-ACM/2018 dtd. 03.09.2018

Sub: Revised syllabus for the Bachelor of Pharmacy (B.Pharm) course
Ref: Agenda-3 of the 32nd meeting of the Academic Council held on 11.08.2018

The Pharmacy Council of India has amended the B.Pharm Syllabus with the following changes.

SEMESTER - I

Included Portion compared to old syllabus	Deleted Portion compared to old syllabus
Human anatomy and physiology-I (Theory)	
Unit III Body fluids and blood <ul style="list-style-type: none"> 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. Lymphatic system <ul style="list-style-type: none"> Lymphatic organs and tissues, lymphatic vessels, lymph circulation and functions of lymphatic system 	Unit III Nervous system <ul style="list-style-type: none"> Organization of nervous system, neuron, neuroglia, classification and properties of nerve fibre, electrophysiology, action potential, nerve impulse, receptors, synapse, neurotransmitters. Central nervous system: Meninges, ventricles of brain and cerebrospinal fluid. structure and functions of brain (cerebrum, brain stem, cerebellum), spinal cord (gross structure, functions of afferent and efferent nerve tracts, reflex activity)
Unit V Cardiovascular system <ul style="list-style-type: none"> 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. 	Unit V Endocrine system <ul style="list-style-type: none"> Classification of hormones, mechanism of hormone action, structure and functions of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas, pineal gland, thymus and their disorders.
Pharmaceutical Analysis-I (Theory)	
Unit – I <ul style="list-style-type: none"> Pharmacopoeia, Sources of Impurities in medicinal agents, limit test. Unit III <ul style="list-style-type: none"> Basic Principles and methods and applications of diazotization titration 	Remaining portions retained.
Human anatomy and physiology-I (Practical)	
1. Introduction to hemocytometry. 2. Enumeration of white blood cell (WBC) count 3. Enumeration of total red blood corpuscles (RBC) count 4. Determination of bleeding time 5. Determination of clotting time 6. Estimation of hemoglobin content 7. Determination of blood group. 8. Determination of erythrocyte sedimentation	1. To study the integumentary and special senses using specimen, models, etc., 2. To study the nervous system using specimen, models, etc., 3. To study the endocrine system using specimen, models, etc 4. To demonstrate the general neurological examination 5. To demonstrate the function of olfactory nerve 6. To examine the different types of taste.

rate (ESR). 9. Determination of heart rate and pulse rate. 10. Recording of blood pressure.	7. To demonstrate the visual acuity 8. To demonstrate the reflex activity 9. Recording of body temperature 10. To demonstrate positive and negative feedback mechanism.
Pharmaceutical Analysis-I (Practical)	
Limit Test of the following (1) Chloride (2) Sulphate (3) Iron (4) Arsenic	Remaining portions retained
Pharmaceutics-I (Practical)	
1. Ferrous Phosphate syrup 2. Terpin hydrate linctus 3. Iodine throat paint 4. Lugol's solution 5. Aluminium hydroxide gel 6. Divded powders 7. Coca butter suppository 8. Zinc oxide suppository 9. Carbopal gel 10. Iodine gargle	1. Paracetamol syrup 2. Simple linctus 3. Soap glycerine 4. Bentonite gel 5. Potassium chlorate gargle

SEMESTER II

Included Portion compared to old syllabus	Deleted Portion compared to old syllabus
Human Anatomy and Physiology-II (Theory)	
Unit: I Nervous system <ul style="list-style-type: none"> • Organization of nervous system, neuron, neuroglia, classification and properties of nerve fibre, electrophysiology, action potential, nerve impulse, receptors, synapse, neurotransmitters. • Central nervous system: Meninges, ventricles of brain and cerebrospinal fluid. structure and functions of brain (cerebrum, brain stem, cerebellum), spinal cord (gross structure, functions of afferent and efferent nerve tracts, reflex activity) 	Unit: I Body fluids and blood <ul style="list-style-type: none"> • 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. Lymphatic system <ul style="list-style-type: none"> • Lymphatic organs and tissues, lymphatic vessels, lymph circulation and functions of lymphatic system
Unit: IV Endocrine system <ul style="list-style-type: none"> • Classification of hormones, mechanism of hormone action, structure and functions of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas, pineal gland, thymus and their disorders. 	Unit: II Cardiovascular system <ul style="list-style-type: none"> • 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.
Pharmaceutical Organic Chemistry-I (Theory)	
Unit II <ul style="list-style-type: none"> • Alcohol: Structure & uses of Methyl Alcohol 	Remaining portions retained
Human Anatomy and Physiology-II (Practical)	

<ol style="list-style-type: none"> 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 neurological examination To demonstrate the function of olfactory nerve To examine the different types of taste. To demonstrate the visual acuity To demonstrate the reflex activity Recording of body temperature To demonstrate positive and negative feedback mechanism. 	<ol style="list-style-type: none"> Introduction to hemocytometry. Enumeration of white blood cell (WBC) count Enumeration of total red blood corpuscles (RBC) count Determination of bleeding time Determination of clotting time Estimation of hemoglobin content Determination of blood group. Determination of erythrocyte sedimentation rate (ESR). Determination of heart rate and pulse rate. Recording of blood pressure.
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SEMESTER III

Included Portion compared to old syllabus	Deleted Portion compared to old syllabus
Pharmaceutical Organic Chemistry-II (Theory)	
Unit II <ul style="list-style-type: none"> Aromatic Acids: Acidity, effect of substituents on acidity and important reactions of benzoic acid. 	Remaining portions retained.
Physical Pharmaceutics-I (Theory)	
Remaining portions retained.	Unit-I : <ul style="list-style-type: none"> Dissolution & drug release, Azeotropic mixtures, fractional distillation
Unit-III: <ul style="list-style-type: none"> Surface & Interfacial phenomenon: Liquid interface, surface & interfacial tensions, surface free energy, measurement of surface & interfacial tensions, spreading coefficient, adsorption at liquid interfaces, surface active agents, HLB scale, solubilisation, detergency, adsorption at solid interfaces. 	Unit-III: <ul style="list-style-type: none"> Micromeritics: Particle size & distribution, average particle size, number & weight distribution, particle number, methods for determining particle size by different methods, counting & separation method, particle shape, specific surface, methods for determining surface area, permeability, adsorption, derived properties of powders, porosity, packing arrangement, densities, bulkiness & flow properties.
Pharmaceutical Engineering (Theory)	
Remaining portions retained.	Unit -II <ul style="list-style-type: none"> Crystallization
Remaining portions retained.	Unit-III <ul style="list-style-type: none"> Distillation topic should be reduced
Remaining portions retained.	Unit-V <ul style="list-style-type: none"> Plant location Material handling system
Physical Pharmaceutics- I (Practical)	


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<ol style="list-style-type: none"> 1. Determination of surface tension of given liquids by drop count & drop weight method 2. Determination of HLB number of a surfactant by saponification method 3. Determination of Freundlich & Langmuir constants using activated charcoal 4. Determination of Critical micellar concentration of surfactants 	<ol style="list-style-type: none"> 1. Determination of particle size, particle size distribution using sieving method 2. Determination of particle size, particle size distribution using microscopic method 3. Determination of bulk density, true density & porosity 4. Determination of angle of repose & influence of lubricant on angle of repose
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SEMESTER - IV

Included Portion compared to old syllabus	Deleted Portion compared to old syllabus
Pharmaceutical Organic Chemistry-III (Theory)	
Unit III <ul style="list-style-type: none"> • Relative aromaticity and reactivity of Furan and Thiophene 	Remaining portions retained.
Physical Pharmaceutics- II (Theory)	
Unit IV: <ul style="list-style-type: none"> • Micromeritics: Particle size & distribution, mean particle size, number & weight distribution, particle number, methods for determining particle size by different methods, counting & separation method, particle shape, specific surface, methods for determining surface area, permeability, adsorption, derived properties of powders, porosity, packing arrangement, densities, bulkiness & flow properties. 	Unit IV: <ul style="list-style-type: none"> • Surface & Interfacial phenomenon: Liquid interface, surface & interfacial tensions, surface free energy, measurement of surface & interfacial tensions, spreading coefficient, adsorption at liquid interfaces, surface active agents, HLB scale, solubilisation, detergency, adsorption at solid interfaces
Physical Pharmaceutics- II (Practical)	
<ol style="list-style-type: none"> 1. Determination of particle size, particle size distribution using sieving method 2. Determination of particle size, particle size distribution using microscopic method 3. Determination of bulk density, true density & porosity 4. Determination of angle of repose & influence of lubricant on angle of repose 	<ol style="list-style-type: none"> 1. Determination of surface tension of given liquids by drop count & drop weight method 2. Determination of HLB number of a surfactant by saponification method 3. Determination of Freundlich & Langmuir constants using activated charcoal 4. Determination of Critical micellar concentration of surfactants

SEMESTER - V


Included Portion compared to old syllabus	Deleted Portion compared to old syllabus
Industrial Pharmacy- I (Theory)	
Name of the subject is changed from Formulative Pharmacy to Industrial Pharmacy-I.	<ul style="list-style-type: none"> • Name of the subject is changed from Formulative Pharmacy to Industrial Pharmacy-I
Pharmacognosy & Phytochemistry II (Theory)	
Unit -II	Unit-II


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Remaining portions retained.	<ul style="list-style-type: none"> General method of extraction and analysis.
Unit-III Isolation, identification and analysis of phytoconstituents: <ul style="list-style-type: none"> Terpenoids: Menthol, Citral, Artemisin Glycosides: Glycyrrhetic acid & Rutin Alkaloids: Atropine, Quinine, Reserpine, Caffeine Resins: Podophyllotoxin, Curcumin 	Remaining portions retained.
Industrial Pharmacy- I (Practical)	
Name of the subject is changed from Formulative Pharmacy to Industrial Pharmacy I	Name of the subject is changed from Formulative Pharmacy to Industrial Pharmacy I
1. Preformulation studies on paracetamol/ aspirin or any other drug 2. Coating of tablets – film coating of tablets/ granules 3. Quality control test (as per IP) of marketed tablets & capsules 4. Preparation of eye drops & eye ointments	1. Preformulation study for prepared granules 2. Coating of tablets 3. Preparation of Paracetamol syrup 4. Preparation of pellets by extrusion spheronization technique

SEMESTER -VI

Included Portion compared to old syllabus	Deleted Portion compared to old syllabus
Biopharmaceutics and pharmacokinetics (Theory)	
Unit-II <ul style="list-style-type: none"> Drug metabolism & basic understanding of metabolic pathway Enhancement of dissolution & bioavailability of poorly soluble drug 	Remaining portions retained.
Unit-III <ul style="list-style-type: none"> $t_{1/2}$, V_d, AUC, CL_t, CL_R definition method of elimination, understanding of their significance and application. 	Remaining portions retained.
Unit-IV <ul style="list-style-type: none"> Steady state drug level, calibration of loading dose & maintain & significance of clinical setting 	Unit-IV <ul style="list-style-type: none"> Repetitive IV injection-one compartment open model Repetitive extravascular-one compartment open model
Remaining portions retained.	Unit-V <ul style="list-style-type: none"> Biotransformation of drugs
Pharmaceutical Biotechnology (Theory)	
Unit -III <ul style="list-style-type: none"> Blood products & Plasma substitutes 	Remaining portions retained.
Unit V: <ul style="list-style-type: none"> Blood products: Collection, Processing & storage of whole human blood, dried human plasma, plasma substitutes 	Remaining portions retained.
Herbal Drug Technology (Practical)	
1. To perform preliminary phytochemical screening of crude drugs.	1. To perform preliminary phytochemical screening of crude drugs.


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2. Determination of the alcohol content of Asava and Arista 3. Evaluation of excipients of natural origin 4. Incorporation of prepared and standardized extract in cosmetic formulations like creams, lotions and shampoos and their evaluation. 5. Incorporation of prepared and standardized extract in formulations like syrups, mixtures and tablets and their evaluation as per Pharmacopoeial requirements. 6. Monograph analysis of herbal drugs from recent Pharmacopoeias 7. Determination of Aldehyde content 8. Determination of Phenol content 9. Determination of total alkaloids	2. Determination of Ash value 3. Determination of moisture content of crude drugs 4. Determination of Extractive values of crude drugs 5. Determination of the alcohol content of Asava and Arista 6. Preparation of herbal cosmetics 7. Preparation and standardization of herbal formulation 8. Determination of swelling index and foaming index 9. Monograph analysis of herbal drugs from recent Pharmacopoeias 10. Analysis of fixed oils
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SEMESTER-VII

Included Portion compared to old syllabus	Deleted Portion compared to old syllabus
Industrial Pharmacy-II (Theory)	
Included Portion compared to old syllabus	Deleted Portion compared to old syllabus
Industrial Pharmacy – II (Subject Name has been changed)	Industrial Pharmacy (Subject Name has been changed)

The Faculty of Pharmacy at its meeting held on 06.03.2018 after considering the issue, recommended the amendment.

The Academic Council and Board of Management considered the proposal for amending the syllabus and approved the same.

This notification is issued for implementation prospectively.


(Dr. G. Shreekumar Menon)
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Copy to:

1. The Principal – YPC&RC
2. The Controller of Examinations

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