OSMANIA UNIVERSITY
FACULTY OF PHARMACY
SCHEME OF INSTRUCTION, EXAMINATION AND EVALUATION

Effective for Batches Admitted from 2016 – 17 Academic Year Onwards As per CBCS

Program Code: 881 **B. Pharmacy First Year (I & II Semesters)**

SEMESTER - I

Course Code	Description	Course Title	Hours/ Week			Credits	Credits		Duration of exam
			L	T	P		-	End exam	
PY.05.881.1.1.T	PS, CORE	Pharmaceutical Inorganic Chemistry	4	0	-	4	30	70	3
PY.05.881.1.2.T	BS, FC	Basic Computer Applications-I	3	0	-	3	30	70	3
PY.05.881.1.3.T	PS, CORE	General Pharmacy	4	0	-	4	30	70	3
PY.05.881.1.4.T	BS, FC	Human Anatomy and Physiology-I	3	0	0	3	30	70	3
PY.05.881.1.5.T	BS, FC	Mathematics / Biology	4	0	0	4	30	70	3
PY.05.881.1.6.P	PS, CORE	Pharmaceutical Inorganic Chemistry-Practical	0	0	4	2	30	70	4
PY.05.881.1.7.P	BS, FC	Basic Computer Applications-I-Practical	0	0	4	2	30	70	4
PY.05.881.1.8.P.	BS, FC	Human Anatomy and Physiology-Practical	0	0	4	2	30	70	4
			18	0	12	24	240	560	

SEMESTER - II

Course Code	Description	Course Title	Hours/ Week			Credits	Credits		Duration of exam
			L	T	P		-	End exam	
PY.05.881.2.1.T	PS, CORE	Pharmaceutical organic Chemistry-I	4	0	-	4	30	70	3
PY.05.881.2.2.T	PS, CORE	Introduction to Dosage Forms	4	0	-	4	30	70	3
PY.05.881.2.3.T	PS, CORE	Human Anatomy and Physiology-II	4	0	-	4	30	70	3
PY.05.881.2.4.T	BS, FC	Basic computer Applications-II	3	0	0	3	30	70	3
PY.05.881.2.5.T	BS, FC	Communicative English	3	0	0	3	30	70	3
PY.05.881.2.6.P	PS, CORE	Pharmaceutical Organic chemistry-I-Practical	0	0	4	2	30	70	4
PY.05.881.2.7.P	BS, FC	Introduction to Dosage Forms-Practical	0	0	4	2	30	70	4

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PY.05.881.2.8.P.	BS, FC	Basic Computer Applications-II and English Language Practical	0	0	4	2	30	70	4
			18	0	12	24	240	560	

Note: Marks are converted into Grade Points and Total is calculated for SGPA on a 10 Point Scale

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SCHEME OF INSTRUCTION AND EXAMINATION
FOR
B. PHARMACY - II YEAR I SEMESTER

COURSE NO.	SUBJECTS	PERIODS/WEEK (50 Mts.)		MARKS	DURATION OF EXAM.	
		Theory	Practicals	Sessionals	Exams.	Hrs.
PYT.2.101	Ph.Organic Chemistry - I	4	--	30	70	3
PYT.2.102	Pharmaceutical.Engineering – I	4	--	30	70	3
PYT.2.103	Pharmaceutical Analysis – I (Chemical Analysis)	4	--	30	70	3
PYT.2.104	Ph. Microbiology	4	--	30	70	3
PYT.2.105	Communicative English*	4		30	70	3
PYP.2.106	Ph. Org. Chemistry – I Lab	--	4	25	50	4
PYP.2.107	Pharmaceutical Analysis – I (Chemical Analysis) Lab	--	4	25	50	4
PYP.2.108	Ph. Microbiology Lab	--	4	25	50	4
		32		225	500	

Candidates admitted into B.Pharm II year directly from Diploma Stream (lateral entry) should study the papers PYT.1.104 – Mathematics, PYT.1.105 – Basic computer applications & PYP.1.110 – Basic Computer Applications Practicals.

SCHEME OF INSTRUCTION AND EXAMINATION
FOR
B. PHARMACY - II YEAR II SEMESTER

COURSE NO.	SUBJECTS	PERIODS/WEEK (50 Mts.)		MARKS	DURATION OF EXAM.	
		Theory	Practicals	Sessionals	Exams.	Hrs.
PYT.2.201	Ph. Organic Chemistry – II	4	--	30	70	3
PYT.2.202	Pharmaceutical Biochemistry	4	--	30	70	3
PYT.2.203	Pharmaceutical Engineering – II	4	--	30	70	3
PYT.2.204	Pharmacognosy – I	4	--	30	70	3
PYT.2.205	Environmental Studies*	4	--	30	70	3

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PYP.2.206	Ph. Org. Chemistry – II Lab	--	4	25	50	4
PYP.2.207	Pharm. Biochemistry Lab	--	4	25	50	4
PYP.2.208	Pharm. Engineering Lab	--	4	25	50	4
		32		225	500	

PHARMACEUTICAL ORGANIC CHEMISTRY – I

Subject Code : PYT 2.101 Sessionsal : 30
Periods / week :4 Examination : 70
Nature of exam: Theory Exam Duration: 3 Hrs

Unit – I

Structure and Reactivity of Organic Molecules

Hybrid orbitals, Molecular orbitals and Covalent bond, Bond angles, Heterolysis, Polarity of covalent bond, Polarity of Molecules, Dipole moments, Intermolecular forces, Boiling Point, Melting Point, Solubility,

Electronic effects: Inductive effect, Electromeric or Mesomeric effect and Resonance. Isomerism (structural and spatial).

Reaction Progress - Activation Energy, Energy diagrams of Reactants and Products.

Unit – II

Aliphatic Hydrocarbons

Nomenclature, Physical properties, General Methods of Preparation and Characteristic reactions of Alkanes, Alkenes and Alkynes; Heats of combustion or Heats of Hydrogenation, Homologous series, Free radical reactions of Alkanes (Halogenation), Catalytic reduction and Electrophilic addition reactions of Alkenes and Alkadienes, Markonikov's Addition, Anti Markonikov's Addition, Peroxide effect or Kharasch effect, Cis-Trans reduction of alkynes, Acidity of 1-Alkynes. Electrophilic addition reactions of alkynes, stability of conjugated alkadienes and their addition reactions.

General methods of preparation of Cycloalkanes: Nomenclature, ring size, stability, Bayer's strain theory, Sachse - Mohr theory, Puckered rings, Congifguration and Conformations of Cycloalkanes, axial and equatorial bonds, Cis-trans Isomers.

Unit – III

Halogen and Hydroxy Compounds

Nomenclature, General Methods of preparation, Relative reactivity of Halides and Hydroxy Compounds, primary, secondary and tertiary classes, Nucleophilic substitution reactions (SN^1 and SN^2) - Walden inversion, Elimination reactions (E^1 and E^2) - Sayetzeffs rule.

Nucleophilic substitution V s Elimination. Oxidation of alcohols;

Ethers: Nomenclature, Properties and Synthesis (Williamson's synthesis and Ziesel's Method).

Unit – IV

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SCHEME OF INSTRUCTION AND EXAMINATION
FOR
B. PHARMACY - III YEAR IST SEMESTER

COURSE NO.	SUBJECTS	PERIODS/WEEK (50 Mts.)		MARKS	DURATION OF EXAM.	
		Theory	Practicals	Sessionals	Exams.	Hrs.
PYT.3.101	Medicinal Chemistry – I	4	--	30	70	3
PYT.3.102	Pharmaceutical Technology (Pharmaceutics – II)	4	--	30	70	3
PYT.3.103	Physical Pharmacy – I	4	--	30	70	3
PYT.3.104	Pharmacognosy – II	4	--	30	70	3
PYT.3.105	Pharmacology – I	4	--	30	70	3
PYP.3.106	Ph.armaceutical Technology (Pharmaceutics – II) Lab	--	4	25	50	4
PYP.3.107	Pharmacognosy Lab	--	6	25	50	4
PYP.3.108	Multimedia Aided Language Lab	--	4	25	50	4
		34		225	500	

SCHEME OF INSTRUCTION AND EXAMINATION
FOR
B. PHARMACY - III YEAR IIND SEMESTER

COURSE NO.	SUBJECTS	PERIODS/WEEK (50 Mts.)		MARKS	DURATION OF EXAM.	
		Theory	Practicals	Sessionals	Exams.	Hrs
PYT.3.201	Pharmaceutical Chemistry (Chemistry of Natural Products)	4	--	30	70	3
PYT.3.202	Pharmacology – II	4	--	30	70	3
PYT.3.203	Physical Pharmacy – II	4	--	30	70	3

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PYT.3.204	Forensic Pharmacy (Pharmaceutical Jurisprudence)	4	--	30	70	3
PYT.3.205	Biostatistics (Pharmacostatistics)	4	--	30	70	3
PYP.3.206	Pharmaceutical Chemistry (Chem. of Natural Products) Lab	--	6	25	50	6
PYP.3.207	Pharmacology Lab	--	4	25	50	4
PYP.3.208	Physical Pharmacy Lab	--	4	25	50	4
		34		225	500	

MEDICINAL CHEMISTRY – I

Subject Code : PYT 3.101 Sessional : 30
Periods/week : 4 Examination : 70
Nature of Exam: Theory Exam Duration: 3 Hrs

Unit – I

Basic Considerations of Drug Activity

Physico chemical properties of drug molecules in relation to biological activity - Solubility, lipophilicity, partition-coefficient, Ionization, hydrogen bonding, Chelation, Redox potential and Surface activity. Bioisosterism and Steric features of drugs, drug distribution and protein binding; Introduction to Pro and Soft drug approach in drug design; Drug metabolism and factors affecting on drug metabolism

NOTE: Introduction, definition, nomenclature, chemical classification (other types of classification wherever relevant), structure, synthesis, general mechanism, mode of action (wherever known), SAR including physicochemical and stereo chemical aspects, metabolism and therapeutic uses of the drugs from each category shall be studied for the following units. An outline of synthetic procedure and metabolism of only the drugs, which are official as per Indian pharmacopoeia and British pharmacopoeia and mentioned in brackets against each category.

Unit – II

Adrenergic agents - (Isoproterenol and Salbutamol)

Adrenergic blocking agents - (Prazocin and Atenatol)

Cholinergic drugs and Acetyl Choline esterase inhibitors - (Carbachol, Physostigmine) Cholinergic blocking agents - (Pyridinium bromide and Dicyclomine HCl)
Ganglionic blocking agents and neuromuscular blocking agents -(Mecamylamine HCl and Pentolinium Tartarate). Skeletal muscle relaxants -Neuromuscular - (meprobromate)

Unit – III

Cardio Vascular Drugs - Anti-hypertensive drugs - (Captopril and Clonidine) Anti-arrhythmic drugs - (Verapamil, Nifedipine and Diltiazem),

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SCHEME OF INSTRUCTION AND EXAMINATION FOR B. PHARMACY - IV YEAR IST SEMESTER

COURSE NO.	SUBJECTS	PERIODS/WEEK (50 Mts.)	MARKS		DURATION OF EXAM.
		Theory/Practicals	Sessionals	Exams.	Hrs.
PYT.4.101	BioPharmaceutics & Pharmacokinetics	4	30	70	3
PYT.4.102	Pharmaceutical Analysis – II (Instrumental Analysis)	4	30	70	3
PYT.4.103	Medicinal Chemistry – II	4	30	70	3
PYT.4.104	Dosage formulation Design (Pharmaceutics – III)	4	30	70	3
PYT.4.105	Ph.Business Management	4	30	70	3
PYP.4.106	Pharmaceutical Analysis – II (Instrumental Analysis) Lab	4	25	50	4
PYP.4.107	Medicinal Chemistry Lab	6	25	50	4
PYP.4.108	Dosage formulation Design (Pharmaceutics – III) Lab	4	25	50	4
		34	225	500	

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SCHEME OF INSTRUCTION AND EXAMINATION FOR B. PHARMACY - IV YEAR IIND

COURSE NO.	SUBJECTS	PERIODS / WEEK (50 Mts.)	MARKS		DURATION OF EXAM.
		Th/Pr	Sessionals	Exams	Hrs.
PYT.4.201	Pharmaceutical Biotechnology	4	30	70	3
PYT.4.202	Hospital and Clinical Pharmacy	4	30	70	3
PYT.4.203	Cosmetic Technology	4	30	70	3
PYT.4.204	Pharmacoinformatics	4	30	70	3
PYP.4.205	Pharmaceutical Biotechnology Lab	4	25	50	4
PYP.4.206	Cosmetic Technology Lab	4	25	50	4
PYP.4.207	Pharmacoinformatics Lab	4	25	50	4
PYP.4.208	Seminar	2	A~B~C~D		
		30	195	430	

BIOPHARMACEUTICS AND PHARMACOKINETICS

Subject Code: PYT. 4 .101 Sessional : 30
Periods/week4 Examination : 70
Nature of Exam: Theory Exam Duration: 3 Hrs

Unit – I

Biopharmaceutics

Introduction & their role in formulation development & clinical settings, fate of drugs after administration.

Drug absorption: drug absorption mechanisms, factors affecting drug absorption (physiochemical biological, metabolic, formulations and dosage form considerations).

Unit – II

Drug distribution & protein binding of drugs

Distribution of drug through organ /tissue - factors affecting distribution

(Physicochemical properties of drugs, organ/tissue size, blood flow to the organ, physiological barriers to the distribution of drugs, drug binding blood / tissue / macromolecules).

Protein /tissue binding of drugs- factors affecting protein binding of drugs, significance and kinetics, tissue binding of drugs.

Unit – III

Drug metabolism & excretion of drugs

Biotransformation of drugs- drug metabolizing enzymes & organs, phase I & phase II reactions. factors affecting biotransformation, drug metabolism significance, extrahepatic metabolism. pharmacological activity of metabolite, deposition of metabolite.

Excretion of drugs - renal excretion of drug, factors affecting renal excretion of drugs, nonrenal

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SCHEME OF INSTRUCTION, EXAMINATION AND EVALUATION

Program Code: 885 M. Pharm. (Pharmaceutical Analysis & Quality Assurance)

2015 – 16

SEMESTER - I

Course Code	Course Title	Hours/Week			Credits	Marks		Duration of Exam
		L	T	P		Internal	End Exam	
PY.09.884.11.T	Pharmaceutical Analytical Techniques	3	0	-	3	25	75	3
PY.09.886.12.T	Pharmaceutical Product Development	4	0	-	4	25	75	3
PY.09.885.13.T	Quality Controlof Health Related Products	4	0	0	4	25	75	3
PY.09.885.14.T	Instrumental Methods of Analysis	4	0	0	4	25	75	3
PY.09.885.15.T	Quality Assurance	3	0	0	3	25	75	3
PY.09.884.11.P	Pharmaceutical Analytical Techniques	-	0	4	2	25	75	6
PY.09.886.12.P	Pharmaceutical Product Development	-	0	4	2	25	75	6
					22	175	525	
PY.09.885.10.S	SAIL	1	2	0	2	Grade		
PY.09.885.11.S	Seminar	1	0	2	2	Grade		

SEMESTER - II

Course Code	Course Title	Hours/Week			Credits	Marks		Duration of Exam
		L	T	P		Internal	End Exam	
PY.09.885.21.T	IPR & Regulatory Affairs	3	0	-	3	25	75	3
PY.09.885.22.T	Analytical Method Validation	4	0	-	4	25	75	3
PY.09.885.23.T	Quality Control Methods	4	0	0	4	25	75	3
PY.09.885.24.T	Biological Standardization	4	0	0	4	25	75	3
PY.09.88X.25.T	Elective *	3	0	0	3	25	75	3
PY.09.885.22.P	Analytical Method Validation	-	0	4	2	25	75	6
PY.09.885.23.P	Quality Control Methods	-	0	4	2	25	75	6
					22	175	525	
PY.09.885.20.S	SAIL	1	2	0	2	Grade		
PY.09.885.21.S	Seminar	1	0	2	2	Grade		

* Discipline Centric –Pharmaceutical Packaging Technology / Drug Polymer Technology;

Open – Quality Assurance & Management.

SEMESTER – III

Course Code	Course Title	Hours /Week	Credits	Marks		Duration in Weeks
				Internal	External	
PY.10.885.31.P	Design Seminar	30	6	50	-	6
PY.10.885.32.P	Report on Progressive Seminar	30	10	50	-	10
		480	16	100		

SEMESTER – IV

Course Code	Course Title	Hours /Week	Credits	Marks		Duration in Weeks
				Internal	External	
PY.10.885.41.P	Pre-Submission Seminar	30	10		50	10
PY.10.885.42.T	Submission and Adjudication	30	12		200	6
PY.10.885.43.T	Final Viva-voce	30	2		50	1
		510	24		300	17

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SCHEME OF INSTRUCTION, EXAMINATION AND EVALUATION

Program Code: 886 **M. Pharm. (Pharmaceutics)**

2015 – 16

SEMESTER - I

Course Code	Course Title	Hours /Week			Credits	Marks		Duration of Exam
		L	T	P		Internal	End Exam	
PY.09.884.11.T	Pharmaceutical Analytical Techniques	3	0	-	3	25	75	3
PY.09.886.12.T	Pharmaceutical Product Development	4	0	-	4	25	75	3
PY.09.886.13.T	Pharmaceutical Production Technology	4	0	0	4	25	75	3
PY.09.886.14.T	Advanced Physical Pharmaceutics	4	0	0	4	25	75	3
PY.09.885.15.T	Quality Assurance	3	0	0	3	25	75	3
PY.09.884.11.P	Pharmaceutical Analytical Techniques	-	0	4	2	25	75	6
PY.09.886.12.P	Pharmaceutical Product Development	-	0	4	2	25	75	6
					22	175	525	
PY.09.886.10.S	SAIL	1	2	0	2	Grade		
PY.09.886.11.S	Seminar	1	0	2	2	Grade		

SEMESTER - II

Course Code	Course Title	Hours /Week			Credits	Marks		Duration of Exam
		L	T	P		Internal	End Exam	
PY.09.885.21.T	Int. Property Rights & Regulatory Affairs	3	0	-	3	25	75	3
PY.09.886.22.T	Biopharmaceutics and Pharmacokinetics	4	0	-	4	25	75	3
PY.09.886.23.T	Advances in Drug Delivery System	4	0	0	4	25	75	3
PY.09.886.24.T	Process Scale Up and Validation	4	0	0	4	25	75	3
PY.09.88X.25.T	Elective *	3	0	0	3	25	75	3
PY.09.886.22.P	Biopharmaceutics and Pharmacokinetics	-	0	4	2	25	75	6
PY.09.886.23.P	Advances in Drug Delivery System	-	0	4	2	25	75	6
					22	175	525	
PY.09.886.20.S	SAIL	1	2	0	2	Grade		
PY.09.886.21.S	Seminar	1	0	2	2	Grade		

* Discipline Centric – Cosmetic Technology/Drug Polymer Technology;
Open – Pharmaceutical Biotechnology

SEMESTER – III

Course Code	Course Title	Hours /Week	Credits	Marks		Duration in Weeks
				Internal	External	
PY.10.886.31.P	Design Seminar	30	6	50	-	6
PY.10.886.32.P	Progressive Seminar	30	10	50	-	10
		480	16	100		

SEMESTER – IV

Course Code	Course Title	Hours /Week	Credits	Marks		Duration in Weeks
				Internal	External	
PY.10.886.41.P	Pre-Submission Seminar	30	10		50	10
PY.10.886.42.P	Submission and Adjudication	30	12		200	6
PY.10.886.43.P	Final Viva-voce	30	2		50	1
		510	24		300	17

Chairperson, BoS Head of the Department Dean of the Faculty

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b) Pharm.D. (Post Baccalaureate) Course -

A pass in B.Pharm from an institution approved by the Pharmacy Council of India under section 12 of the Pharmacy Act:

Provided that there shall be reservation of seats for the students belonging to the Scheduled Castes, Scheduled Tribes and other Backward Classes in accordance with the instructions issued by the Central Government/State Government/Union Territory Administration as the case may be from time to time.

5. Number of admissions in the above said programmes shall be as prescribed by the Pharmacy Council of India from time to time and presently be restricted as below –
   i) Pharm.D. Programme – 30 students.
   ii) Pharm.D. (Post Baccalaureate) Programme – 10 students.

6. Institutions running B.Pharm programme approved under section 12 of the Pharmacy Act, will only be permitted to run Pharm.D. programme. Pharm.D. (Post Baccalaureate) programme will be permitted only in those institutions which are permitted to run Pharm.D. programme.

7. Course of study. – The course of study for Pharm.D. shall include the subjects as given in the Tables below. The number of hours in a week, devoted to each subject for its teaching in theory, practical and tutorial shall not be less than that noted against it in columns (3), (4) and (5) below.

TABLES

First Year :

S.No.	Name of Subject	No. of hours of Theory	No. of hours of Practical	No. of hours of Tutorial
(1)	(2)	(3)	(4)	(5)
1.1	Human Anatomy and Physiology	3	3	1
1.2	Pharmaceutics	2	3	1
1.3	Medicinal Biochemistry	3	3	1
1.4	Pharmaceutical Organic Chemistry	3	3	1
1.5	Pharmaceutical Inorganic Chemistry	2	3	1
1.6	Remedial Mathematics/ Biology	3	3*	1
	Total hours	**16**	**18**	**6 = (40)**

* For Biology

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Second Year:

S.No	Name of Subject	No. of hours of Theory	No. of hours of Practical	No. of hours of Tutorial
(1)	(2)	(3)	(4)	(5)
2.1	Pathophysiology	3	-	1
2.2	Pharmaceutical Microbiology	3	3	1
2.3	Pharmacognosy & Phytopharmaceuticals	3	3	1
2.4	Pharmacology-I	3	-	1
2.5	Community Pharmacy	2	-	1
2.6	Pharmacotherapeutics-I	3	3	1
	Total Hours	**17**	**9**	**6 = 32**

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