JSS Academy of Higher Education and Research

JSS College of Pharmacy

Sri Shivarathreeshwara Nagar, Mysuru-570015

Ph: 0821-2548353, Fax: 0821-2548359, Email: jsscpmy@jssuni.edu.in

Website: www.jsspharma.org

An ISO 9001:2008 Certified Institution

JSS ACADEMY OF HIGHER EDUCATION & RESEARCH

(DEEMED TO BE UNIVERSITY) MYSURU

Accredited 'A' Grade by NAAC

Course Handout

2017-18

Class: B. Pharm – II Semester

Name : _____

Roll No. : _____

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VISION

To be a leader in pharmaceutical sciences & pharmacy practice education, training, research and continuous professional development for pharmacists and Pharmaceutical Scientists providing competent patient care and nurturing drug discovery and development.

MISSION

- To impart knowledge, develop skills and competencies in students in pharmaceutical sciences and pharmacy practice.
- Develop and advance the knowledge, attitude and skills of pharmacists and faculty members who can provide comprehensive pharmaceutical care to patients, improve patient outcomes, and meet societal needs for safe and effective drug therapy.
- To develop, promote and nurture research activities in pharmaceutical sciences and pharmacy practice and translating research into healthcare

CORE VALUES

- Innovation, Leadership, Excellence, Integrity, Respect, Professionalism

Academic Calendar 2017-18
(B.Pharm - II Semester)

1. **Commencement of Classes**

   B.Pharm – II Semester - 04th December, 2017

2. **Sessional Examination Schedule**

I	II
15, 16, 17, 19 & 20th Feb 2018	20, 21, 22, 24 & 25th April 2018

3. **Closure of Term** - 25th April, 2018
4. **Annual Examination** - 7th May, 2018
5. **Annual Vacation** - From 25th May' 2018 to 24th June 2018

Teacher's Incharge

Class	Class Teacher	Batch No.	Batch Teacher
I B.Pharm II Semester	Mrs. A.M. Mahalakshmi	I	Vertical Mentorship
		II	Vertical Mentorship
		III	Vertical Mentorship
		IV	Vertical Mentorship

ACTIVITIES AND COORDINATORS 2017-18

Curricular & Co curricular activities

Sl. No	Activities	Coordinators	Schedule
1.	Induction, learning skills and personality development programmes for fresher's	DHPG	First Week of Commencement of First year of each course
2.	Anti ragging cell	JS/AMM/JUS	June 17 - May 18
3.	Grievance and redressal cell	PKK	June 17 - May 18
4.	Industrial Visits, Training and placements	MNP/TMP/ABP	June 17 - May 18
5.	Guest lectures &Seminars/conferences/training/workshop • organized at college • delivered/attended by staff	HVG	June 17 - May 18
6.	Internal Assessment Committee Chairperson Members	 GVP KM/RSS/SNM/BMV	June 17 - May 18
7.	• Academic Council Board • Identification of Advanced/ Medium/ Slow learners	Class Teachers	June 17 - May 18
8.	Ethics committee Meeting • Animal • Human	 KLK MR	June 17 - May 18
9.	Time table	MSV/UM/AKT/HKS /AMR/NPK	June 17 - May 18
10.	IQAC	MNP/VKG/VJ/ AMM/JL	June 17 - May 18
11.	Women's cell (Prevention of Sexual Harassment Cell)	MNN	June 17 - May 18
12.	Scholarship Bureau	RSC	June 17 - May 18
13.	Compilation of publications (Research papers/books/chapters)	BMG	June 17 - May 18
14.	Research Review Committee -Compilation of Ph.D details and funded projects - Plagiarism - Review of publications	Chairperson – DVG Members – BMG/BRP/HVG/KU	June 17 - May 18
15.	Pharmacy Education Unit (CCLPE)	PKK/KU/AMR	June 17 - May 18
16.	Admission Facilitation Cell	TMP/BV/JS/HP	June 17 - May 18
17.	Annual result analysis List of merit students	Exam section/ Program committee	June 17 - May 18

18.	GPAT and other competitive exams (TOEFL, GRE etc.)	AMM	June 17 - May 18
19.	Innovative Pedagogy	Pharmacy Education Unit	June 17 - May 18
20.	Library orientation	NS	June 17 - May 18
21.	Soft Skills Training	VKG	June 17 - May 18

Program Committee

Sl. No.	Program	Chairperson	Member Secretary	Schedule
22.	D.Pharm	TMP	BMV	June 17 - May 18
23.	B.Pharm	PKK	KM	June 17 - May 18
24.	Pharm.D	MR	RSS	June 17 - May 18
25.	M.Pharm	TMP	SNM	June 17 - May 18

Extracurricular activities

Sl. No.	Activities	Coordinators	Schedule
26.	• Selection of Class Representatives, Pharmaceutical society members • Annual planning and execution of Student centered and professional activities including inauguration of IPS	AKT	Within a month of Commencement of course June 17 - May 18
27.	JASPHARM	BMV	June 17 - May 18
28.	STUMAG	JUS	June 17 - May 18
29.	Sports coordinators	KLK/JK/NPK	June 17 - May 18
30.	NSS coordinators	BRJ/MPG	June 17 - May 18
31.	Cultural & Literary coordinators	MNN/SP/RSC	June 17 - May 18

Other Institutional activities

Sl. No.	Activities	Coordinators	Period
32.	Annual Day celebration	HVG/SM	March 2018
33.	Course handouts/ Teachers diary/ Student handbook/faculty handbook	MPV/RSC	June 2017
34.	National Pharmacy Week (NPW) & Pharmacists Day	UM + IPA team	Nov 2017
35.	Alumni association	TMP/SM/BS	June 17 - May 18
36.	Herbal and College Garden	JS	June 17 - May 18
37.	ISO	MSV/DHPG	June 17 - May 18
38.	Press and publicity	BMV	June 17 - May 18
39.	Foreign students cell	MPV	June 17 - May 18
40.	Governing council meeting	Principal's Office	June 17 - May 18

41.	Monthly/Annual report of college activities to JSSU and other agencies	HoDs/JL	June 17 - May 18
42.	College website	HKS/VKG	June 17 - May 18
43.	Research & Consultancy Co-ordinator • Collaboration with Industries/organizations • Interdepartment/Interdisciplinary research	SBC	June 17 - May 18
44.	Co-ordinator - JSSUonline.com	VKG/ABP	June 17 - May 18
45.	JSSU Newsletter	BMV	June 17 - May 18
46.	Annual group photo session	KM/Shivanna	June 17 - May 18
47.	Lab coat and Blazers	JS	June 17 - May 18
48.	Notice Board (SNB, LNB and IIPC), Departmental staff list	Nagaraju	June 17 - May 18
49.	Stock verification	Office staff/Librarian	June 17 - May 18
50.	Student Liaison	Ms. Divya S	June 17 - May 18
51.	Student ID Cards	Shivanna / Manjunath	Within a month of Commencement of course

B.PHARM

Program Educational Objectives (PEOs):

PEO 1: To acquire the theoretical knowledge of pharmaceutical sciences

PEO 2: To acquire practical skills in

- isolation of medicinal compounds from natural sources
- synthesis and analysis of medicinal compounds
- screening medicinal compounds for pharmacological activities
- formulation of pharmaceutical dosage forms and their evaluation

PEO 3: To develop competent Pharmacists with ethical attitude, research intuition, leadership qualities, to participate in public health programs and engage in life-long learning

Program Outcomes (POs):

1. Ability to acquire knowledge of pharmaceutical sciences
2. Ability to design and conduct experiments, to analyze and interpret data
3. Ability to demonstrate effective planning, develop and implement plans within time frame.
4. Ability to function effectively individually and on teams, including diverse and multidisciplinary, to accomplish a task.
5. Ability to understand and appreciate the role of pharmacist in healthcare services.
6. Understanding of professional, ethical, legal, security and social issues and responsibilities.
7. Ability to understand contemporary issues relating to pharmacy profession and challenges ahead.
8. Awareness of ethical and professional responsibilities.
9. Possess the necessary interpersonal and communication skills to be a productive member of the team in work environment.
10. Ability to use current techniques, skills, and modern tools.
11. A strong background and motivation to pursue life-long learning

COURSE HAND OUT 2017-18 Class: II Semester - B. Pharm

1. Course Details

Course Code	Name of the course	No. of hours	Tutorial	Credit points
BP201T	Human Anatomy and Physiology II– Theory	3	1	4
BP202T	Pharmaceutical Organic Chemistry I – Theory	3	1	4
BP203T	Biochemistry – Theory	3	1	4
BP204T	Pathophysiology – Theory	3	1	4
BP205T	Computer applications in Pharmacy – Theory*	3	-	3
BP206T	Environmental Science – Theory*	3	-	3
BP207P	Human Anatomy and Physiology II– Practical	4	-	2
BP208P	Pharmaceutical Organic Chemistry I – Practical	4	-	2
BP209P	Biochemistry – Practical	4	-	2
BP210P	Computer applications in Pharmacy – Practical*	2	-	1
	Total	**32**	**4**	**29**

*****Non University Examination (NUE)

2. Evaluation:

a. Internal assessment: Continuous mode

The marks allocated for Continuous mode of Internal Assessment, as per the scheme given below.

Table 1: Scheme for awarding internal assessment: Continuous mode

THEORY		
Criteria	**Maximum Marks**	
Attendance	4	2
Academic activities (Average of any 3 activities e.g. quiz, assignment, open book test, field work, group discussion and seminar)	3	1.5
Student – Teacher interaction	3	1.5
Total	**10**	**5**
PRACTICALS		
Attendance	2	
Based on Practical Records, Regular viva voce, etc.	3	
Total	**5**	

Table 2: Guidelines for the allotment of marks for attendance

Percentage of Attendance	Theory	Practical
95 – 100	4	2
90 – 94	3	1.5
85 – 89	2	1
80 – 84	1	0.5
Less than 80	0	0

b. Sessional Exams

Two Sessional exams shall be conducted for each theory / practical course as per the schedule fixed by the college(s). The scheme of question paper for theory and practical Sessional examinations is given below. The average marks of two Sessional exams shall be computed for internal assessment as per the requirements.

Sessional exam shall be conducted for 30 marks for theory and shall be computed for 15 marks. Similarly Sessional exam for practical shall be conducted for 40 marks and shall be computed for 10 marks.

Question paper pattern for theory Sessional examinations

For subjects having University examination

I. Multiple Choice Questions (MCQs) OR	=	10 x 1 = 10 OR
Objective Type Questions (5 X 2)	=	05 x 2 = 10
I. Long Answers (Answer 1 out of 2)	=	1 x 10 = 10
II. Short Answers (Answer 2 out of 3)	=	2 x 5 = 10
	Total =	30 marks

For subjects having Non University Examination

I. Long Answers (Answer 1 out of 2)	=	1 x 10 = 10
II. Short Answers (Answer 4 out of 6)	=	4 x 5 = 20
	Total =	30 marks

Question paper pattern for practical sessional examinations

I. Synopsis	=	10
II. Experiments	=	25
III. Viva voce	=	05
	Total =	40 marks

3. End semester examinations

The End Semester Examinations for each theory and practical course through semesters I to VIII shall be conducted by the university except for the subjects notified as non-university examinations

Table 3: Scheme for internal assessments and university examination - Semester-II

Course code	Name of the course	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration	
			Marks	Duration				
BP201T	Human Anatomy and Physiology II – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP202T	Pharmaceutical Organic Chemistry I – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP203T	Biochemistry – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP204T	Pathophysiology – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP205T	Computer Applications in Pharmacy – Theory *	10	15	1 Hr	25	50	2 Hrs	75
BP206P	Environmental sciences – Theory *	10	15	1 Hr	15	50	2 Hrs	75
BP207P	Human Anatomy and Physiology II – Practical	5	10	4 Hrs	15	35	4 Hrs	50
BP208P	Pharmaceutical Organic Chemistry I– Practical	5	10	4 Hrs	15	35	4 Hrs	50
BP209P	Biochemistry – Practical	5	10	4 Hrs	15	35	4 Hrs	50
BP210P	Computer Applications in Pharmacy – Practical*	5	5	2 Hrs	10	15	2 Hrs	25
	Total	**80**	**125**	**20 Hrs**	**205**	**520**	**30 Hrs**	**725**

*****Non University Examination (NUE)

* The subject experts at college level shall conduct examinations

Question paper pattern for end semester theory examinations

For 75 marks paper

I. Multiple Choice Questions (MCQs) OR = 20 x 1 = 20 OR
Objective Type Questions (5 X 2) = 10 x 2 = 20
I. Long Answers (Answer 2 out of 3) = 2 x 10 = 20
II. Short Answers (Answer 7 out of 9) = 7 x 5 = 35

Total = 75 marks

For 50 marks paper

I. Long Answers (Answer 2 out of 3)	=	2 x 10 = 20
II. Short Answers (Answer 6 out of 8)	=	6 x 5 = 30

Total	=	50 marks

For 35 marks paper

I. Long Answers (Answer 1 out of 2)	=	1 x 10 = 10
II. Short Answers (Answer 5 out of 7)	=	5 x 5 = 25

Total	=	35 marks

Question paper pattern for end semester practical examinations

I. Synopsis	=	5
II. Experiments	=	25
III. Viva voce	=	5

Total	=	35 marks
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4. Promotion and award of grades

A student shall be declared PASS and eligible for getting grade in a course of B.Pharm. programme if he/she secures at least 50% marks in that particular course including internal assessment. For example, to be declared as PASS and to get grade, the student has to secure a minimum of 50 marks for the total of 100 including continuous mode of assessment and end semester theory examination and has to secure a minimum of 25 marks for the total 50 including internal assessment and end semester practical examination.

5. Carry forward of marks

In case a student fails to secure the minimum 50% in any Theory or Practical course as specified (in promotion and award of grades), then he/she shall reappear for the university examination of that course. However his/her marks of the Internal Assessment shall be carried over and he/she shall be entitled for grade obtained by him/her on passing.

6. Improvement of internal assessment

A student shall have the opportunity to improve his/her performance only once in the Sessional exam component of the internal assessment. The re-conduct of the Sessional exam shall be completed before the commencement of next end semester theory examinations.

7. Re-examination of end semester examinations

Reexamination of end semester examination shall be conducted as per the schedule given in Table 4. The exact dates of examinations will be notified from time to time.

Table 4: Tentative schedule of university examinations and supplementary examinations

Semester	Regular examinations	Supplementary examinations
I, III, V and VII	November / December	May / June
II, IV, VI and VIII	May / June	November / December

8. Grading of performances

Letter grades and grade points allocations

Based on the performances, each student shall be awarded a final letter grade at the end of the semester for each course.

Table 5: Letter grades and grade points equivalent to percentage of marks and performances

Percentage of Marks Obtained	Letter Grade	Grade Point	Performance
90.00 – 100	A+	10	Outstanding
80.00 – 89.99	A	9	Excellent
70.00 – 79.99	B	8	Good
60.00 – 69.99	C	7	Fair
50.00 – 59.99	D	6	Average
Less than 50	F	0	Fail
Absent	AB	0	Fail

A learner who remains absent in any form of evaluation/examination, letter grade allocated to him/her should be assigned a letter grade of AB and a corresponding grade point of zero. He/she should reappear for the said evaluation/examination in due course.

9. Declaration of class

The class shall be awarded on the basis of CGPA as follows:

First Class with Distinction = CGPA of. 7.50 and above
First Class = CGPA of 6.00 to 7.49
Second Class = CGPA of 5.00 to 5.99

10. Attendance: The marks is allotted based on the attendance percentage (Table 2)

11. Chamber consultation hours: Any time during college hours.

12. Tutorial Class: Objective of the tutorial is to enhance the learning ability and help students in better understanding of the subject. This provides a best opportunity for the students to clarify their subject doubts. This involves discussions, presentations on specified topics, assignments and evaluation.

BP 201T. HUMAN ANATOMY AND PHYSIOLOGY-II (Theory)

Teacher: Ms. A.M. Mahalakshmi (AMM) **45 Hours (3 Hrs/ week)**

Scope: This subject is designed to impart fundamental knowledge on the structure and functions of the various systems of the human body. It also helps in understanding both homeostatic mechanisms. The subject provides the basic knowledge required to understand the various disciplines of pharmacy.

Objectives: At the end of the course, the student shall be able to

1. Explain the gross morphology, structure and functions of various organs of the human body.
2. Describe the various homeostatic mechanisms and their imbalances.
3. Identify the various tissues and organs of different systems of human body.
4. Perform the hematological tests like blood cell counts, haemoglobin estimation, bleeding/clotting time etc and also record blood pressure, heart rate, pulse and respiratory volume.
5. Appreciate coordinated working pattern of different organs of each system
6. Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.

Lecture wise programme:

	Topic	**Hrs**
1.	**Nervous system** 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)	**10**
2.	**Digestive system** Anatomy of GI Tract with special reference to anatomy and functions of stomach, (Acid production in the stomach, regulation of acid production through parasympathetic nervous system, pepsin role in protein digestion) small intestine and large intestine, anatomy and functions of salivary glands, pancreas and liver, movements of GIT, digestion and absorption of nutrients and disorders of GIT **Energetics** Formation and role of ATP, Creatinine Phosphate and BMR.	**06**

3. **Respiratory Systems:** **10**

   Anatomy of respiratory system with special reference to anatomy of lungs, mechanism of respiration, regulation of respiration. Lung Volumes and capacities transport of respiratory gases, artificial respiration, and resuscitation methods.

   Urinary system

   Anatomy of urinary tract with special reference to anatomy of kidney and nephrons, functions of kidney and urinary tract, physiology of urine formation, micturition reflex and role of kidneys in acid base balance, role of RAS in kidney and disorders of kidney.

4. **Endocrine system** **10**

   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.

5. **Reproductive system** **09**

   Anatomy of male and female reproductive system, Functions of male and female reproductive system, sex hormones, physiology of menstruation, fertilization, spermatogenesis, oogenesis, pregnancy and parturition

   Introduction to genetics

   Chromosomes, genes and DNA, protein synthesis, genetic pattern of inheritance

Theory Sessional examination syllabus

Sessional No.	Syllabus
	Chapters no.
I	1, 2 and 3 (Respiratory systems)
II	3 (Urinary systems),4 and 5

Recommended Books (Latest Editions)

1. Essentials of Medical Physiology by K. Sembulingam and P. Sembulingam. Jaypee brothers medical publishers, New Delhi.
2. Anatomy and Physiology in Health and Illness by Kathleen J.W. Wilson, Churchill Livingstone, New York
3. Physiological basis of Medical Practice-Best and Tailor. Williams & Wilkins Co,Riverview,MI USA
4. Text book of Medical Physiology- Arthur C,Guyton andJohn.E. Hall. Miamisburg, OH, U.S.A.
5. Principles of Anatomy and Physiology by Tortora Grabowski. Palmetto, GA, U.S.A.
6. Textbook of Human Histology by Inderbir Singh, Jaypee brothers medical publishers, New Delhi.
7. Textbook of Practical Physiology by C.L. Ghai, Jaypee brothers medical publishers, New Delhi.

8. Practical workbook of Human Physiology by K. Srinageswari and Rajeev Sharma,
9. Jaypee brother's medical publishers, New Delhi.

Reference Books:

1. Physiological basis of Medical Practice-Best and Tailor. Williams & Wilkins Co, Riverview, MI USA
2. Text book of Medical Physiology- Arthur C, Guyton and John. E. Hall. Miamisburg, OH, U.S.A.
3. Human Physiology (vol 1 and 2) by Dr. C.C. Chatterrje ,Academic Publishers Kolkata

BP 207 P. HUMAN ANATOMY AND PHYSIOLOGY (Practical)

Teacher: Ms. A.M. Mahalakshmi (AMM) ` 60 Hours (4 Hrs/ week)

Practical physiology is complimentary to the theoretical discussions in physiology. Practicals allow the verification of physiological processes discussed in theory classes through experiments on living tissue, intact animals or normal human beings. This is helpful for developing an insight on the subject.

List of Experiments:

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.
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.
11. Determination of tidal volume and vital capacity.
12. Study of digestive, respiratory, cardiovascular systems, urinary and reproductive systems with the help of models, charts and specimens.
13. Recording of basal mass index .
14. Study of family planning devices and pregnancy diagnosis test.
15. Demonstration of total blood count by cell analyser
16. Permanent slides of vital organs and gonads.

BP202T. PHARMACEUTICAL ORGANIC CHEMISTRY –I (Theory)

Teacher/s: Mr. M.S.Venkatesh (MSV) 45 Hours (3 Hrs/ week)

Scope: This subject deals with classification and nomenclature of simple organic compounds, structural isomerism, intermediates forming in reactions, important physical properties, reactions and methods of preparation of these compounds. The syllabus also emphasizes on mechanisms and orientation of reactions.

Objectives: Upon completion of the course the student shall be able to

1. write the structure, name and the type of isomerism of the organic compound
2. write the reaction, name the reaction and orientation of reactions
3. account for reactivity/stability of compounds,
4. identify/confirm the identification of organic compound

Lecture wise Programme

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

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

	Topics	Hrs
1	**Classification, nomenclature and isomerism** Classification of Organic Compounds Common and IUPAC systems of nomenclature of organic compounds (up to 10 Carbons open chain and carbocyclic compounds) Structural isomerisms in organic compounds	07
2	**Alkanes*, Alkenes* and Conjugated dienes*** SP3 hybridization in alkanes, Halogenation of alkanes, uses of paraffins. Stabilities of alkenes, SP2 hybridization in alkenes, E1 and E2 reactions – kinetics, order of reactivity of alkyl halides, rearrangement of carbocations, Saytzeffs orientation and evidences. E1 verses E2 reactions, Factors affecting E1 and E2 reactions. Ozonolysis, electrophilic addition reactions of alkenes, Markownikoff's orientation, free radical addition reactions of alkenes, Anti Markownikoff's orientation. Stability of conjugated dienes, Diel-Alder, electrophilic addition, free radical addition reactions of conjugated dienes, allylic rearrangement	10

3 Alkyl halides* 10

SN1 and SN2 reactions - kinetics, order of reactivity of alkyl halides, stereochemistry and rearrangement of carbocations.

SN1 versus SN2 reactions, Factors affecting SN1 and SN2 reactions Structure and uses of ethylchloride, Chloroform, trichloroethylene, tetrachloroethylene, dichloromethane, tetrachloromethane and iodoform.

Alcohols*- Qualitative tests, Structure and uses of Ethyl alcohol, Methyl alcohol, chlorobutanol, Cetosteryl alcohol, Benzyl alcohol, Glycerol, Propylene glycol

4 Carbonyl compounds* (Aldehydes and ketones) 10

Nucleophilic addition, Electromeric effect, aldol condensation, Crossed Aldol condensation, Cannizzaro reaction, Crossed Cannizzaro reaction, Benzoin condensation, Perkin condensation, qualitative tests, Structure and uses of Formaldehyde, Paraldehyde, Acetone, Chloral hydrate, Hexamine, Benzaldehyde, Vanilin, Cinnamaldehyde.

5 Carboxylic acids* 08

Acidity of carboxylic acids, effect of substituents on acidity, inductive effect and qualitative tests for carboxylic acids ,amide and ester

Structure and Uses of Acetic acid, Lactic acid, Tartaric acid, Citric acid, Succinic acid. Oxalic acid, Salicylic acid, Benzoic acid, Benzyl benzoate, Dimethyl phthalate, Methyl salicylate and Acetyl salicylic acid

Aliphatic amines* - Basicity, effect of substituent on Basicity. Qualitative test, Structure and uses of Ethanolamine, Ethylenediamine, Amphetamine

Theory Internal assessment syllabus

Internal assessment No.	Syllabus Chapters no.
I	1, 2 and 3 (Alkyl Halides)
II	3 (Alcohols),4 and 5

BP208P. PHARMACEUTICAL ORGANIC CHEMISTRY -I (Practical)

Teacher: Mr. M.S.Venkatesh (MSV) ` 60 Hours (4 Hrs/ week)

List of Experiments:

1. Systematic qualitative analysis of unknown organic compounds like
    a. Preliminary test: Color, odour, aliphatic/aromatic compounds, saturation and unsaturation, etc.
    b. Detection of elements like Nitrogen, Sulphur and Halogen by Lassaigne's test
    c. Solubility test
    d. Functional group test like Phenols, Amides/ Urea, Carbohydrates,
    e. Amines, Carboxylic acids, Aldehydes and Ketones, Alcohols, Esters, Aromatic and Halogenated Hydrocarbons, Nitro compounds and Anilides.
    f. Melting point/Boiling point of organic compounds
    g. Identification of the unknown compound from the literature using melting point/ boiling point.
    h. Preparation of the derivatives and confirmation of the unknown compound bymelting point/ boiling point.
    i. Minimum 5 unknown organic compounds to be analysed systematically.
2. Preparation of suitable solid derivatives from organic compounds
3. Construction of molecular models

Recommended Books (Latest Editions)

1. Organic Chemistry byMorrison and Boyd
2. Organic Chemistry by I.L. Finar , Volume-I
3. Textbook of Organic Chemistry by B.S. Bahl & Arun Bahl.
4. Organic Chemistry by P.L.Soni
5. Practical Organic Chemistry byMann and Saunders.
6. Vogel's text book of Practical Organic Chemistry
7. Advanced Practical organic chemistry by N.K.Vishnoi.
8. Introduction to Organic Laboratory techniques by Pavia, Lampman and Kriz.
9. Reaction and reaction mechanism by Ahluwaliah/Chatwal.

BP203 T. BIOCHEMISTRY (Theory)

Teacher/s: Dr. G.V. Pujar (GVP) & Dr. Rupshee Jain (RJ) 45 Hours (3 Hrs/ week)

Scope: Biochemistry deals with complete understanding of the molecular levels of the chemical process associated with living cells. The scope of the subject is providing biochemical facts and the principles to understand metabolism of nutrient molecules in physiological and pathological conditions. It is also emphasizing on genetic organization of mammalian genome and hetero & autocatalytic functions of DNA.

Objectives: Upon completion of course student shell able to

1. Understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes.
2. Understand the metabolism of nutrient molecules in physiological and pathological conditions.
3. Understand the genetic organization of mammalian

Lecture wise Programme:

	Topics	Hrs
1	**Biomolecules** Introduction, classification, chemical nature and biological role of carbohydrate, lipids, nucleic acids, amino acids and proteins. **Bioenergetics** Concept of free energy, endergonic and exergonic reaction, Relationship between free energy, enthalpy and entropy; Redox potential. Energy rich compounds; classification; biological significances of ATP and cyclic AMP	**08**
2	**Enzymes** Introduction, properties, nomenclature and IUB classification of enzymes Enzyme kinetics (Michaelis plot, Line Weaver Burke plot) Enzyme inhibitors with examples Regulation of enzymes: enzyme induction and repression, allosteric enzymes regulation Therapeutic and diagnostic applications of enzymes and isoenzymes Coenzymes –Structure and biochemical functions	**07**
3	**Carbohydrate metabolism** Glycolysis – Pathway, energetics and significance Citric acid cycle- Pathway, energetics and significance HMP shunt and its significance; Glucose-6-Phosphate dehydrogenase (G6PD) deficiency Glycogen metabolism Pathways and glycogen storage diseases (GSD)	**10**

	Gluconeogenesis- Pathway and its significance Hormonal regulation of blood glucose level and Diabetes mellitus **Biological oxidation** Electron transport chain (ETC) and its mechanism. Oxidative phosphorylation & its mechanism and substrate phosphorylation Inhibitors ETC and oxidative phosphorylation/Uncouplers	
4	**Lipid metabolism** β-Oxidation of saturated fatty acid (Palmitic acid) Formation and utilization of ketone bodies; ketoacidosis De novo synthesis of fatty acids (Palmitic acid) Biological significance of cholesterol and conversion of cholesterol into bile acids, steroid hormone and vitamin D Disorders of lipid metabolism: Hypercholesterolemia, atherosclerosis, fatty liver and obesity. **Amino acid metabolism** General reactions of amino acid metabolism: Transamination, deamination & decarboxylation, urea cycle and its disorders Catabolism of phenylalanine and tyrosine and their metabolic disorders (Phenyketonuria, Albinism, alkeptonuria, tyrosinemia) Synthesis and significance of biological substances; 5-HT, melatonin, dopamine, noradrenaline, adrenaline Catabolism of heme; hyperbilirubinemia and jaundice	**10**
5	**Nucleic acid metabolism and genetic information transfer** Biosynthesis of purine and pyrimidine nucleotides Catabolism of purine nucleotides and Hyperuricemia and Gout disease Organization of mammalian genome Structure of DNA and RNA and their functions DNA replication (semi conservative model) Transcription or RNA synthesis Genetic code, Translation or Protein synthesis and inhibitors	**10**

Theory Internal assessment syllabus

Internal assessment No.	Syllabus
	Unit
I	1, 2 and 3 (Carbohydrate metabolism)
II	3 (Biological oxidation), 4 and 5

BP209P. BIOCHEMISTRY (Practical)

Teacher: Dr. Rupshee Jain (RJ) & Dr. H Yogish Kumar (YKH) 60 Hours (4 Hrs/ week)

List of Experiments:

1. Qualitative analysis of carbohydrates (Glucose, Fructose, Lactose, Maltose, Sucrose and starch)
2. Identification tests for Proteins (albumin and Casein)
3. Quantitative analysis of reducing sugars (DNSA method) and Proteins (Biuret method)
4. Qualitative analysis of urine for abnormal constituents
5. Determination of blood creatinine
6. Determination of blood sugar
7. Determination of serum total cholesterol
8. Preparation of buffer solution and measurement of pH
9. Study of enzymatic hydrolysis of starch
10. Determination of Salivary amylase activity
11. Study the effect of Temperature on Salivary amylase activity.
12. Study the effect of substrate concentration on salivary amylase activity.

Recommended Books (Latest Editions)

1. Principles of Biochemistry by Lehninger.
2. Harper's Biochemistry by Robert K. Murry, Daryl K. Granner and Victor W. Rodwell.
3. Biochemistry by Stryer.
4. Biochemistry by D. Satyanarayan and U.Chakrapani
5. Textbook of Biochemistry by Rama Rao.
6. Textbook of Biochemistry by Deb.
7. Outlines of Biochemistry by Conn and Stumpf
8. Practical Biochemistry by R.C. Gupta and S. Bhargavan.
9. Introduction of Practical Biochemistry by David T. Plummer. (3rd Edition)
10. Practical Biochemistry for Medical students by Rajagopal and Ramakrishna.
11. Practical Biochemistry by Harold Varley.

BP 204T.PATHOPHYSIOLOGY (THEORY)

Teacher/s: Ms. R.S.Savitha (RSS) **45 Hours (3 Hrs/ week)**

Scope: Pathophysiology is the study of causes of diseases and reactions of the body to such disease producing causes.This course is designed to impart a thorough knowledge of the relevant aspects of pathology of various conditions with reference to its pharmacological applications, and understanding of basic pathophysiological mechanisms. Hence it will not only help to study the syllabus of pathology, but also to get baseline knowledge required to practice medicine safely, confidently, rationally and effectively.

Objectives: Upon completion of the subject student shall be able to –

1. Describe the etiology and pathogenesis of the selected disease states;
2. Name the signs and symptoms of the diseases; and
3. Mention the complications of the diseases.

Lecturewise Programme:

	Topics	Hrs
1	**Basic principles of Cell injury and Adaptation:** Introduction, definitions, Homeostasis, Components and Types of Feedback systems, Causes of cellular injury,Pathogenesis (Cell membrane damage, Mitochondrial damage, Ribosome damage, Nuclear damage),Morphology of cell injury – Adaptive changes (Atrophy, Hypertrophy, hyperplasia, Metaplasia, Dysplasia),Cell swelling, Intra cellular accumulation, Calcification, Enzyme leakage and Cell Death Acidosis &Alkalosis, Electrolyte imbalance **Basic mechanism involved in the process of inflammation and repair:** Introduction, Clinical signs of inflammation, Different types of Inflammation, Mechanism of Inflammation – Alteration in vascular permeability and blood flow, migration of WBC's, Mediators of inflammation, Basic principles of wound healing in the skin, Pathophysiology of Atherosclerosis	10
2	**Cardiovascular System:** Hypertension, congestive heart failure, ischemic heart disease (angina,myocardial infarction, atherosclerosis and arteriosclerosis) **Respiratory system:** Asthma, Chronic obstructive airways diseases. **Renal system:** Acute and chronic renal failure	10
3	**Haematological Diseases:** Iron deficiency, megaloblastic anemia (Vit B12 and folic acid), sickle cell anemia, thalasemia, hereditary acquired anemia, haemophilia **Endocrine system:** Diabetes, thyroid diseases, disorders of sex hormones	10

	Nervous system: Epilepsy, Parkinson's disease, stroke **Psychiatric disorders:** depression, schizophrenia and Alzheimer's disease **Gastrointestinal system:** Peptic Ulcer	
4	Inflammatory bowel diseases, jaundice, hepatitis (A,B,C,D,E,F) alcoholic liver disease. **Disease of bones and joints**: Rheumatoid arthritis, osteoporosis and gout **Principles of cancer:** classification, etiology and pathogenesis of cancer	**08**
5	**Infectious diseases:** Meningitis,Typhoid, Leprosy, Tuberculosis Urinary tract infections **Sexually transmitted diseases:** AIDS, Syphilis, Gonorrhea	**07**

Theory Internal assessment syllabus

Internal assessment No.	**Syllabus Chapters no.**
I	1, 2 and 3 (Hematological Diseases)
II	3 (Endocrine system),4 and 5

Recommended Books (Latest Editions)

1. Vinay Kumar, Abul K. Abas, Jon C. Aster; Robbins &Cotran Pathologic Basis of Disease; South Asia edition; India; Elsevier; 2014.
2. HarshMohan; Text book of Pathology; 6th edition; India; Jaypee Publications; 2010.
3. Laurence B, Bruce C, Bjorn K. ; Goodman Gilman's The Pharmacological Basis of Therapeutics; 12th edition; New York; McGraw-Hill; 2011.
4. Best, Charles Herbert 1899-1978; Taylor, Norman Burke 1885-1972; West, John B (John Burnard); Best and Taylor's Physiological basis of medical practice; 12th ed; united states; William and Wilkins, Baltimore;1991 [1990 printing].
5. Nicki R. Colledge, Brian R. Walker, Stuart H. Ralston;Davidson's Principles and Practice of Medicine; 21st edition; London; ELBS/Churchill Livingstone; 2010.
6. Guyton A, John .E Hall; Textbook of Medical Physiology; 12th edition; WB Saunders Company; 2010.
7. Joseph DiPiro, Robert L. Talbert, Gary Yee, Barbara Wells, L. Michael Posey; Pharmacotherapy: A Pathophysiological Approach; 9th edition; London; McGraw-Hill Medical; 2014.
8. V. Kumar, R. S. Cotran and S. L. Robbins; Basic Pathology; 6th edition; Philadelphia; WB Saunders Company; 1997.

9. Roger Walker, Clive Edwards; Clinical Pharmacy and Therapeutics; 3rd edition; London; Churchill Livingstone publication; 2003.

Recommended Journals

1. The Journal of Pathology. ISSN: 1096-9896 (Online)
2. The American Journal of Pathology. ISSN: 0002-9440
3. Pathology. 1465-3931 (Online)
4. International Journal of Physiology, Pathophysiology and Pharmacology. ISSN: 1944-8171 (Online)
5. Indian Journal of Pathology and Microbiology. ISSN-0377-4929.

BP205 T. COMPUTER APPLICATIONS IN PHARMACY (THEORY)

Teacher/s: Dr. D.H.P. Gowda (DHP) **30 Hours (2 Hrs/ week)**

Scope: This subject deals with the introduction Database, Database Management system, computer application in clinical studies and use of databases.

Objectives: Upon completion of the course the student shall be able to

1. know the various types of application of computers in pharmacy
2. know the various types of databases
3. know the various applications of databases in pharmacy

Lecturewise Programme:

	Topics	Hrs
1	**Number system:** Binary number system, Decimal number system, Octal number system, Hexadecimal number systems, conversion decimal to binary, binary to decimal, octal to binary etc, binary addition, binary subtraction – One's complement ,Two's complement method, binary multiplication, binary division **Concept of Information Systems and Software :** Information gathering, requirement and feasibility analysis, data flow diagrams, process specifications, input/output design, process life cycle, planning and managing the project	**06**
2	**Web technologies:** Introduction to HTML, XML,CSS and Programming languages, introduction to web servers and Server Products Introduction to databases, MYSQL, MS ACCESS, Pharmacy Drug database	**06**
3	**Application of computers in Pharmacy** – Drug information storage and retrieval, Pharmacokinetics, Mathematical model in Drug design, Hospital and Clinical Pharmacy, Electronic Prescribing and discharge (EP) systems, barcode medicine identification and automated dispensing of drugs, mobile technology and adherence monitoring Diagnostic System, Lab-diagnostic System, Patient Monitoring System, Pharma Information System	**06**
4	**Bioinformatics:** Introduction, Objective of Bioinformatics, Bioinformatics Databases, Concept of Bioinformatics, Impact of Bioinformatics in Vaccine Discovery	**06**
5	**Computers as data analysis in Preclinical development:** Chromatographic dada analysis(CDS), Laboratory Information management System (LIMS) and Text Information Management System(TIMS**)**	**06**

Theory Internal assessment syllabus

Internal assessment No.	Syllabus Chapters no.
I	1, 2 and 3 (Appl. of computers in pharmacy)
II	3 (Diagnostic systems),4 and 5

Recommended books (Latest edition):

1. Computer Application in Pharmacy – William E.Fassett –Lea and Febiger, 600 South Washington Square, USA, (215) 922-1330.
2. Computer Application in Pharmaceutical Research and Development –Sean Ekins – Wiley-Interscience, A John Willey and Sons, INC., Publication, USA
3. Bioinformatics (Concept, Skills and Applications) – S.C.Rastogi-CBS Publishers and Distributors, 4596/1- A, 11 Darya Gani, New Delhi – 110 002(INDIA)
4. Microsoft office Access - 2003, Application Development Using VBA, SQL Server, DAP and Infopath – Cary N.Prague – Wiley Dreamtech India (P) Ltd., 4435/7, Ansari Road, Daryagani, New Delhi - 110002

BP210P. COMPUTER APPLICATIONS IN PHARMACY (Practical)

Teacher: Dr. D.H.P. Gowda (DHP) ` **60 Hours (4 Hrs/ week)**

List of Experiments:

1. Design a questionnaire using a word processing package to gather information about a particular disease.
2. Create a HTML web page to show personal information.
3. 3 Retrieve the information of a drug and its adverse effects using online tools
4. 4 Creating mailing labels Using Label Wizard , generating label in MS WORD
5. 5 Create a database in MS Access to store the patient information with the required fields Using access
6. Design a form in MS Access to view, add, delete and modify the patient record in the database
7. Generating report and printing the report from patient database
8. Creating invoice table using – MS Access
9. Drug information storage and retrieval using MS Access
10. Creating and working with queries in MS Access
11. Exporting Tables, Queries, Forms and Reports to web pages
12. Exporting Tables, Queries, Forms and Reports to XML pages

BP 206 T. ENVIRONMENTAL SCIENCES (Theory)

Teacher/s: Mr. Lingaraju **30 Hours (2 Hrs/ week)**

Scope: Environmental Sciences is the scientific study of the environmental system and the status of its inherent or induced changes on organisms. It includes not only the study of physical and biological characters of the environment but also the social and cultural factors and the impact of man on environment.

Objectives: Upon completion of the course the student shall be able to:

1. Create the awareness about environmental problems among learners.
2. Impart basic knowledge about the environment and its allied problems.
3. Develop an attitude of concern for the environment.
4. Motivate learner to participate in environment protection and environment improvement.
5. Acquire skills to help the concerned individuals in identifying and solving environmental problems.
6. Strive to attain harmony with Nature.

Lecturewise Programme:

	Topics	Hrs
1	**The Multidisciplinary nature of environmental studies** The Multidisciplinary nature of environmental studies Natural Resources Renewable and non-renewable resources: Natural resources and associated problems a) Forest resources; b) Water resources; c) Mineral resources; d) Food resources; e) Energy resources; f) Land resources: Role of an individual in conservation of natural resources.	**10**
2	**Ecosystems** □ Concept of an ecosystem. □ Structure and function of an ecosystem. □ Introduction, types, characteristic features, structure and function of the ecosystems: Forest ecosystem; Grassland ecosystem; Desert ecosystem; Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)	**10**
3	Environmental Pollution: Air pollution; Water pollution; Soil pollution	**10**

Theory Internal assessment syllabus

Internal assessment No.	Syllabus Chapters no.
I	1, 2 (till ecosystems)
II	2 (from ecosystems) and 3

Recommended Books (Latest edition):

1. Y.K. Sing, Environmental Science, New Age International Pvt, Publishers, Bangalore
2. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
3. Bharucha Erach, The Biodiversity of India, Mapin Pu blishing Pvt. Ltd., Ahmedabad – 380 013, India,
4. Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
5. Clark R.S., Marine Pollution, Clanderson Press Oxford
6. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p
7. De A.K., Environmental Chemistry, Wiley Eastern Ltd.
8. Down of Earth, Centre for Science and Environment

Jagadguru Sri Shivarathreeshwara University

JSS College of Pharmacy

Sri ShivarathreeshwaraNagara, Mysore-570015

CLASS TIME TABLE – 2017-18*

Class: B. PHARM II- Semester

Lunch Break: 1.00 to 2.00 PM
Tea Break: 10.40 to 11.10 AM
3.50 PM to 4.05 PM

Time / Day	9.00-9.50AM	9.50-10.40AM		11.10-12.05PM	12.05–1.00PM		2.00-2.55PM	2.55-3.50PM		4.05-5.00PM	5.00-6.00PM
Monday	ES	Pathophysiology **RSS**	TEA BREAK	Pharmaceutical Org. Chem.-I MSV	Pathophysiology **RSS**	LUNCH BREAK	Biochemistry RJ	Human Anatomy & Physiology-II **AMM**	TEA BREAK	CAP DHP	---------
Tuesday	---------	Biochemistry GVP (TU)		Human Anatomy & Physiology-II **AMM**	ES		←-Human Anatomy &Physiology-II ← Pharm. Organic Chemistry-I---- ← ----Biochemistry---------- ← ---- CAP ---------- BIV --DHP→			----------BI ---AMM---------→ ---------- BII---MSV----------→ ----------BIII ---RJ----------→	
Wednesday	ES	ES		Human Anatomy & Physiology-II **AMM**	Biochemistry RJ		←-Human Anatomy &Physiology-II ← Pharm. Organic Chemistry-I---- ← ----Biochemistry---------- ← ---- CAP ----- BI --DHP→			----------BII—AMM ---------→ ----------BIII--MSV----------→ ----------BIV ---RJ----------→ ---------- ----------	
Thursday	---------	Biochemistry RJ		Pharmaceutical Org. Chem.-I MSV	CAP DHP		←-Human Anatomy &Physiology-II ← Pharm. Organic Chemistry-I---- ← ----Biochemistry---------- ← ---- CAP - BII --DHP→			---------- BIII -AMM----------→ ---------- BIV--MSV----------→ ---------- BI ---HYK----------→	
Friday	---------	Pharmaceutical Org. Chem.-I MSV		Pathophysiology **RSS**	Pathophysiology **RSS (TU)**		←-Human Anatomy &Physiology-II ←- Pharm. Organic Chemistry-I---- ← ----Biochemistry---------- ← ---- CAP ---- BIII --DHP→			---------- BIV--AMM----------→ ---------- BI---MSV----------→ ---------- BII -HYK----------→	
Saturday	---------	CAP DHP		Human Anatomy & Physiology-II **AMM (TU)**	Pharmaceutical Org. Chem.-I MSV (TU)		----------				

***Effective from: 11th December 2017**

Note: 1. No tea break for practicals
2. Forenoon practical starts from 10.00AM

Time table Coordinator

Principal

Copy: SNB/LNB/SCF/SCC-Teachers/OC/TTF-MSV/PP Dept./Extra-MSV.

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