JSS Academy of Higher Education and Research

JSS College of Pharmacy

Sri Shivarathreeshwara Nagara, Mysuru-570015

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An ISO 9001:2015 Certified Institution

JSS ACADEMY OF HIGHER EDUCATION & RESEARCH
(DEEMED TO BE UNIVERSITY) MYSURU

IVth Pharm.D.
Course Handout
2020-21

Accredited 'A^{+}' Grade by NAAC	**1st in Karnataka & 3rd in INDIA to be rated with 4 stars**	**Ranked 1st among the YOUNG UNIVERSITIES in Karnataka**	**JSS College of Pharmacy, Mysuru – 10th Rank in INDIA 2020**	INTERNATIONAL CERTIFICATION Pharm D Program is Certified by Accreditation Council for Pharmacy Education (ACPE), USA

ARIIA
ATAL RANKING OF INSTITUTIONS ON INNOVATION ACHIEVEMENTS

Ranked 4th in India for 2019

Academic Calendar 2020-21
(IV Pharm.D.)

Teacher's Incharge

Class	Class Teacher	Batch No.	Batch Teacher
IV Pharm.D.	Mrs. Shilpa Palaksha	I	Mrs. Shilpa Palaksha
		II	Mr. B.R. Jaidev Kumar

ACTIVITIES AND COORDINATORS 2020-21

Curricular & Co curricular activities

Sl. No	Activities	Coordinator/s
1.	Induction, learning skills and personality development programs for fresher's	DHP/MPG
2.	Selection of class representative in first week of commencement of each course	
3.	Anti ragging cell	HP/ BM
4.	Grievance and redressal cell	PKK
5.	Industrial Visits, Training and placements	TS/ABP
6.	Guest lectures & Seminars/ conferences/ training / workshop • organized at college • delivered/attended by staff	Respective department all HODs
7.	Internal Assessment Committee Chairperson Members	 GVP RSS/SNM/DAT/BMV
8.	• Academic Council Board • Identification of Advanced/ Medium/ Slow learners	Class Teachers Subject Teachers
9.	Ethics committee Meeting • Animal • Human	 KLK MR
10.	Time table	DHP TS/ URR/ VR/AMM/HYK
11.	Internal Quality Assurance Cell Chairperson Members	 PKK/ AMM/AKT/HVG/SP
12.	Women's cell (Prevention of Sexual Harassment Cell)	SNM
13.	Scholarship Bureau	RSC

14.	Compilation of publications (Research papers/books/chapters)	BMG
15.	Research Coordination Committee -Compilation of Ph.D details and funded projects - Plagiarism - Review of publications	Chairperson – DVG Members – BRP/SB/JS
16.	Pharmacy Education Unit (CCLPE)	PKK/KU/RSS
17.	Annual result analysis List of merit students	UG – Subject Teacher, Class teacher & Program committee PG – Course Coordinator & Abhishek (Office)
18.	GPAT and other competitive exams (TOEFL, GRE etc.)	BM/ CSH/MPG
19.	Library orientation	Librarian
20.	Soft Skills Training	ABP

Extracurricular activities

Sl. No.	Activities	Coordinator/s
21.	• Selection of Class Representatives, Pharmaceutical society members • Annual planning and execution of Student centered and professional activities including inauguration of IPS	MSS/ SRD
22.	JASPHARM	BS/ SM / CSH
23.	STUMAG	HYK
24.	Sports coordinators	MPV/HKS
25.	NSS coordinators	MPG / UM/ SND
26.	Cultural & Literary coordinators	KNS/CI

Other Institutional activities

Sl. No.	Activities	Coordinator/s
27.	Annual Day celebration / Graduation day	DAT/SM
28.	Course handouts/ Teachers diary/ Student handbook/Faculty handbook	HYK/PS
29.	National Pharmacy Week (NPW) & Pharmacists	VJ/ UM + IPA team

	Day	
30.	Alumni association	HVG/ AKT/SM/BS
31.	Herbal and College Garden	JS/ NPK/VR
32.	ISO	DHP/SNM
33.	Press and publicity	KLK /BMV/OFFICE
34.	Foreign students cell	MPV
35.	Governing council meeting	JUS/ Office
36.	Monthly/Annual report of college activities to JSS AHER and other agencies	HoDs/JUS/ST/AKT/AM/KU/NPK Asha (office)
37.	College website	HKS/KU
38.	Research & Consultancy Co-ordinator • Collaboration with Industries/organizations • Interdepartment/Interdisciplinary research	DVG/ SB/ KM
39.	Coordinator - JSSUonline.com	ABP/TS
40.	JSSU Newsletter	KLK SRD/ KNS
41.	Annual group photo session	MSS/ SRD
42.	Lab coat and Blazers	JS / Ningaraju
43.	Notice Board (SNB, LNB and IIPC), Departmental staff list	Nagaraju
44.	Stock verification	Office staff /Librarian
45.	Student Liaison	Divya S
46.	Student ID Cards /Attendance entry	Shivanna / Manjunath
47.	Retreat for Pharmacy Students	AKT/ HKS/BRJ
48.	Feedback	VJ
49.	Institute Innovation Cell	HVG/PKK
50.	Practice School	MPG/VJ

Program Committee

Sl. No.	Program committees	Chairperson	Member Secretary
51.	D.Pharm	PKK	BMV
52.	B.Pharm	PKK	DAT
53.	Pharm.D	MR	RSS
54.	M.Pharm	PKK	SNM
55.	B.Pharm – Practice	MR	BRJ
56.	PG Diploma	PKK	JS

M.Pharm Program Coordinators

Sl.	M.Pharm Program	Coordinator

No.		
57.	Pharmaceutics	VJ
58.	Industrial Pharmacy	ABP
59.	Pharmaceutical Regualatory Affairs	MPV
60.	Pharmaceutical Quality Assurance	HVG
61.	Pharmaceutical Chemistry	BRP
62.	Pharmaceutical Analysis	BMG
63.	Pharmacology	KLK
64.	Pharmacognosy	NPK
65.	Pharmacy Practice	SP

PG Diploma Program Coordinators

Sl. No.	PG Diploma Program	Coordinator
66.	Pharmacovigilance	CSH
67.	Medicine & Poison Information	RSS
68.	Clinical Research	JUS
69.	Nanotechnology	VJ
70.	Pharmaceutical Quality Assurance	HVG
71.	Pharmaceutical Regulatory Affairs	MPV
72.	Medical Devices	BMV
73.	Intellectual Property Rights	BMV
74.	Computer Aided Drug Design	DAT
75.	Food and Drug Analysis	RSC
76.	Regulatory Toxicology	SB
77.	Phytopharmaceutical and Industrial Applications	JS

Certificate Course Coordinators

Sl. No.	Certificate Course	Coordinator
78.	Pharmaceutical Quality Assurance	HVG
79.	Herbal Drug Standardization	JS
80.	Medicine Information	RSS

TEACHING STAFF LIST

Sl. No	NAME	QUALIFICATION	DESIGNATION	Department
1	Dr. T.M. Pramod Kumar (TMP)	M.Pharm., Ph.D.	Professor & Principal	Pharmaceutics
2	Dr. P.K. Kulkarni (PKK)	M.Pharm., Ph.D.	Professor & Vice Principal	Pharmaceutics
3	Dr. D. Vishakante Gowda (DVG)	M.Pharm., Ph.D.	Professor & Head	Pharmaceutics
4	Dr. Balamuralidhara V. (BMV)	M.Pharm., Ph.D.	Asst. Professor	Pharmaceutics
5	Dr. Gangadharappa H.V.(HVG)	M.Pharm., Ph.D.	Asst. Professor	Pharmaceutics
6	Dr. M.P. Venkatesh (MPV)	M.Pharm., Ph.D.	Asst. Professor	Pharmaceutics
7	Dr. Vikas Jain (VJ)	M.Pharm., Ph.D.	Asst. Professor	Pharmaceutics
8	Dr. Amit B Patil (ABP)	M.Pharm., Ph.D.	Asst. Professor	Pharmaceutics
9	Dr. Gowrav M P (MPG)	M.Pharm., Ph.D.	Lecturer	Pharmaceutics
10	Mr. Hemanth Kumar S (HKS)	M.Pharm	Lecturer	Pharmaceutics
11	Mrs. Asha Spandana K M (ASP)	M.Pharm	Lecturer	Pharmaceutics
12	Mr B Mahendran (BM)	M.Pharm	Lecturer	Pharmaceutics
13	Dr Shailesh T (TS)	M.Pharm., Ph.D.	Lecturer	Pharmaceutics
14	Smt Preethi S (PS)	M.Pharm	Lecturer	Pharmaceutics
15	Dr. M. Ramesh (MR)	M.Pharm., Ph.D.	Professor & Head	Pharmacy Practice
16	Mr. D.H. P. Gowda (DHP)	M.Sc., PGDCA.	Asst. Professor	Pharmacy Practice
17	Mrs. Shilpa Palaksha (SP)	M.Pharm.	Asst. Professor	Pharmacy Practice
18	Mrs. Savitha R S (RSS)	M.Pharm.	Asst. Professor	Pharmacy Practice
19	Mr. Jaidev Kumar B R (BRJ)	M.Pharm.	Lecturer	Pharmacy Practice
20	Dr. M Umesh (UM)	Pharm D.	Lecturer	Pharmacy Practice
21	Dr. Juny Sebstian (JUS)	M.Pharm., Ph.D.	Lecturer	Pharmacy Practice
22	Dr Sri Harsha Chalasani (CSH)	M.Pharm., Ph.D.	Lecturer	Pharmacy Practice
23	Dr. Krishna Undela (KU)	M.Pharm., Ph.D.	Lecturer	Pharmacy Practice
24	Dr Srikanth M S (MSS)	M.Pharm., Ph.D.	Lecturer	Pharmacy Practice
25	Mr Balaji S (BS)	M.Pharm	Lecturer	Pharmacy Practice
26	Dr U R Rakshith (URR)	Pharm D	Lecturer	Pharmacy Practice
27	Dr. B.M. Gurupadayya (BMG)	M.Pharm., Ph.D.	Professor	Pharma. Chemistry
28	Dr. Gurubasavaraj V Pujar (GVP)	M.Pharm., Ph.D.	Professor & Head	Pharma. Chemistry
29	Dr. Prashantha Kumar B R (BRP)	M.Pharm., Ph.D.	Asst. Professor	Pharma. Chemistry
30	Dr. R. S. Chandan (RSC)	M.Pharm., Ph.D.	Asst. Professor	Pharma. Chemistry
31	Dr. Anand Kumar Tengli (AKT)	M.Pharm., Ph.D.	Asst. Professor	Pharma. Chemistry
32	Dr. Durai Ananda Kumar (DAT)	M.Pharm., Ph.D.	Asst. Professor	Pharma. Chemistry

33	Dr. Jaishree V (JV)	M.Pharm., Ph.D.	Asst. Professor	Pharma. Chemistry
34	Dr. H. Yogish Kumar (HYK)	M.Pharm., Ph.D.	Lecturer	Pharma. Chemistry
35	Dr. Sheshagiri Dixit (SRD)	M.Pharm., Ph.D.	Lecturer	Pharma. Chemistry
36	Mr. Chetan.I.A	M.Pharm	Lecturer	Pharma. Chemistry
37	Dr. K Mruthunjaya (KM)	M.Pharm., Ph.D.	Professor & Head	Pharmacognosy
38	Dr. J. Suresh (JS)	M.Pharm., Ph.D.	Professor	Pharmacognosy
39	Dr. N Paramakrishnan (NPK)	M.Pharm., Ph.D.	Lecturer	Pharmacognosy
40	Mr. Vageesh Revadigar (VR)	M.Pharm	Lecturer	Pharmacognosy
41	Ms. Haripriya G	M Pharm	Lecturer	Pharmacognosy
42	Dr. S. N. Manjula (SNM)	M.Pharm., Ph.D.	Professor & Head	Pharmacology
43	Dr. Saravana Babu C (SB)	M.Pharm., Ph.D.	Asso.Professor	Pharmacology
44	Dr. K L Krishna (KLK)	M.Pharm., Ph.D.	Asst. Professor	Pharmacology
45	Mrs. A M Mahalakshmi (AMM)	M.Pharm.	Lecturer	Pharmacology
46	Mrs. Seema Mehdi (SM)	M.Pharm	Lecturer	Pharmacology
47	Dr. Nagashree K S (KNS)	M.Pharm., Ph.D	Lecturer	Pharmacology

PHARM.D

Expected Competencies and outcomes:

1. Development of knowledge and skills
2. Assessment of patient medical condition
3. Development of pharmaceutical care plan
4. Management of patient medication therapy
5. Pharmacotherapeutic decision-making skills
6. Hospital pharmacy management
7. Promote public health care program
8. Ethics and professionalism
9. Analytical thinking and interpretational skills
10. Communication skills
11. Management skills
12. Design and conduct of need based research projects
13. Life-long learning

COURSE HAND OUT 2020-21 Class: IV Pharm. D

1. Course Details

S. No.	Name of Subject	No. of hours of Theory	No. of hours of Practical/ Hospital Posting	No. of hours of Tutorial
(1)	**(2)**	**(3)**	**(4)**	**(5)**
4.1	Pharmacotherapeutics-III	3	3	1
4.2	Hospital Pharmacy	2	3	1
4.3	Clinical Pharmacy	3	3	1
4.4	Biostatistics & Research Methodology	2	-	1
4.5	Biopharmaceutics & Pharmacokinetics	3	3	1
4.6	Clinical Toxicology	2	-	1
4.7	Pharmacotheraputics I & II*	3*	3*	1*
	Total hours	**15/18***	**12/15***	**6/7 = 33/40***

* Only for Post Baccalaureate Students

2. Evaluation:

Theory: Internal assessment Marks: 30.Three periodic theory sessional examinations will be conducted in theory for 30 marks (*duration 1.5 Hour*) and average of best two will be considered for evaluation.

Practical: Internal assessment Marks: 30. Three periodic practical sessional examinations will be conducted for 20 marks and average of best two will be considered for evaluation, plus 10 marks is awarded for regularity, promptness, viva-voce and record maintenance. JSS University will conduct annual examination for 70 marks in theory & practical at end of the academic session.

Classes will be awarded on the basis of total (sessional and annual examination) marks secured.

Class	Marks
Distinction	75% and above
First class	60% and above and less than 75%
Second class	50% and above and less than 60%
Pass class	Passed examination in more than one attempt.

3 Sessional Examination schedule: I, II and III sessional dates will be announced separately.

4 Attendance: Minimum of 80% attendance is necessary to appear for both Sessional and Annual examination.

5 Chamber consultation hours: Any time during College hours.

6 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.

4.1 PHARMACOTHERAPEUTICS -III (THEORY)

Theory: 3 Hrs /week

Responsible Member of the academic staff: Mrs. Shilpa Palaksha (SP)

Scope and Objective: This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt covers brief pathophysiology and discussion on therapeutics of various diseases. This will enable the student to understand the concept o etiopathogenesis of various diseases and their management.

At completion of this course it is expected that student will able to:
(Student learning outcomes)
Theory:

1. Describe the etiopathogenesis of selected diseases and correlate them to clinical condition(s) of the respective disease.
2. Explain the general therapeutic approach to management of selected diseases.
3. Apply the knowledge to justify the clinical controversies and rationale in individualizing drug therapy plans.
4. Distinguish the management strategies of selected diseases in special populations.
5. Assess drug safety monitoring, contraindications and treatment outcomes and modify treatment plan as needed.

Practical:

1. Gather and analyse patient medical records and prepare pharmaceutical care plan.
2. Perform treatment chart review and identify medication related problems (MRPs).
3. Communicate and resolve MRPs to concerned health care professionals.
4. Perform the patient medication counselling as per the requirement of the patient and/or recommended by a clinician.

Teaching/learning methodologies used:

1. Lecture
2. Practical/Lab
3. Discussion
4. Case Study

Course Materials:

TEXT BOOKS

a. Clinical Pharmacy and Therapeutics - Roger and Walker, Churchill Livingstone publication
b. Pharmacotherapy: A Pathophysiologic approach - Joseph T. Dipiro et al. Appleton & Lange

REFERENCE BOOKS

a. Pathologic basis of disease - Robbins SL, W.B.Saunders publication
b. Pathology and Therapeutics for Pharmacists - A Basis for Clinical Pharmacy Practice - Green and Harris, Chapman and Hall publication
c. Clinical Pharmacy and Therapeutics - Eric T. Herfindal, Williams and Wilkins Publication
d. Applied Therapeutics: The clinical Use of Drugs. Lloyd Young and Koda-Kimble MA
e. Avery's Drug Treatment - 4th Edn, 1997, Adis International Limited.
f. Relevant review articles from recent medical and pharmaceutical literature.

Lecture wise Programme

Etiopathogenesis and pharmacotherapy of diseases associated with following systems/ diseases

Topic	Hrs
1. Gastrointestinal system: Peptic ulcer disease, Gastro Esophageal Reflux Disease, Inflammatory bowel disease, Liver disorders - Alcoholic liver disease, Viral hepatitis including jaundice, and Drug induced liver disorders.(3+4+3+4+3+3)	20
2. Hematological system: Anaemias, Venous thromboembolism, Drug induced blood disorders. (4+4+4)	12
3. Nervous system: Epilepsy, Parkinsonism, Stroke, Alzheimer's disease, (4+3+6+3)	16
4. Psychiatry disorders: Schizophrenia, Affective disorders, Anxiety disorders, Sleep disorders, Obsessive Compulsive disorders (4+3+3+2+2)	14
5. Pain management including Pain pathways, neuralgias, headaches. (4+2+2)	08
6. Evidence Based Medicine	05

Theory Sessional Examination Syllabus

Sessional No.	Syllabus
I	1,6
II	2, 3 (Except Alzheimer's disease)
III	3 (Alzheimer's disease), 4, 5

4.1 PHARMACOTHERAPEUTICS – III (PRACTICALS)

Practical: 75 Hours (3 Hrs/Week)

Responsible Member of the academic staff: Mrs. Shilpa Palaksha (SP)

Practicals:
Hospital postings for a period of at least 50 hours is required to understand the principles and practice involved in ward round participation and clinical discussion on selection of drug therapy. Students are required to maintain a record of 15 cases observed in the ward and the same should be submitted at the end of the course for evaluation. Each student should present at least two medical cases they have observed and followed in the wards.

Assignments:
Students are required to submit written assignments on the topics given to them. Topics allotted should cover recent developments in drug therapy of various diseases. A minimum of THREE assignments [1500 – 2000 words] should be submitted for evaluation.

Format of the assignment:
1. Minimum & Maximum number of pages
2. Reference(s) shall be included at the end in Vancouver style.
3. Assignment can be a combined presentation at the end of the academic year
4. It shall be computer draft copy
5. Name and signature of the student is mandatory on the first page of assignment
6. Time allocated for presentation may be 8+2 Min.

Scheme of Practical Examination:

	Sessionals	**Annual**
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max Marks	**20**	**70**
Duration	**03 hrs**	**04 hrs**

Note: Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

4.2 HOSPITAL PHARMACY (THEORY)

Theory: 2 Hrs /week

Responsible Member of the academic staff: Dr. Umesh M (UM)

Scope and Objective: In the changing scenario of pharmacy practice in India, for successful practice of Hospital Pharmacy, the students are required to learn various skills like drug distribution, drug dispensing, manufacturing of parenteral preparations, drug information, patient counseling, and therapeutic drug monitoring for improved patient care.

At completion of this course it is expected that student will able to:
(Student learning outcomes)
Theory:

1. Explain the organization, structure, functions and management of hospital pharmacy and various committees in the hospital
2. Discuss the elements of hospital formulary
3. Explain the drug procurement process and various drug distribution systems in the hospital
4. Describe the various manufacturing processes of various dosage forms in the hospital.

Practical:

1. Synthesize and provide drug information from various resources
2. Perform inventory analysis using different inventory control methods
3. Identify the drug- drug interaction in the given prescriptions and suggest the management for the same
4. Prepare and submit the required quantity of parenteral formulations and powders

Teaching/learning methodologies used:

1. Lecture
2. Practical/Lab
3. Discussion
4. Simulation

Course materials:

TEXT BOOKS:

a. Hospital pharmacy by William .E. Hassan
b. A text book of Hospital Pharmacy by S.H.Merchant & Dr.J.S.Qadry. Revised by R.K.Goyal & R.K. Parikh
c. Hospital pharmacy by M. C. Allwood, J. T. Fell.
d. Stockley's Drug Interactions (10th Edition).

REFERENCE BOOKS:

a. WHO consultative group report.
b. R.P.S. Vol.2. Part –B; Pharmacy Practice section.
c. Handbook of pharmacy – health care. Edt. Robin J Harman. The Pharmaceutical press.

Lecture wise programme:

Topics	Hrs
Hospital - its Organization and functions	**01**
Hospital pharmacy-Organization and management	**05**
a) Organizational structure-Staff, Infrastructure & work load statistics	
b) Management of materials and finance	
c) Roles & responsibilities of hospital pharmacist	
The Budget – Preparation and implementation	**01**
Hospital drug policy	**11**
a) Pharmacy and Therapeutic Committee (PTC)	
b) Hospital formulary	
c) Hospital committees	
- Infection committee	
- Research and ethical committee	
d) Development of therapeutic guidelines	
e) Hospital pharmacy communication – Newsletter	
Hospital pharmacy services	
a) Procurement & warehousing of drugs and Pharmaceuticals	**02**
b) Inventory control**:** Definition, various methods of Inventory Control ABC, VED, EOQ, Lead time and safety stock	**04**
c) Drug distribution in the hospital	**04**
i) Individual prescription method	
ii) Floor stock method	
iii) Unit dose drug distribution method	
d) Distribution of Narcotic and other controlled substances	**02**
e) Central sterile supply services – Role of pharmacist	**02**
Manufacture of Pharmaceutical preparations	**11**
a) Sterile formulations – large and small volume parenterals	**03**
b) Manufacture of Ointments, Liquids, and creams	**03**
c) Manufacturing of Tablets, granules, capsules, and powders	**03**
d) Total parenteral nutrition	**02**
Continuing professional development programs	**02**
Education and training	
Radio Pharmaceuticals – Handling and packaging	**03**
Professional Relations and practices of hospital pharmacist	**02**

Theory Sessional Examination Syllabus

Sessional No.	Syllabus
I	1-4 (a, b, c)
II	4 (d, e) 5
III	6, 7, 8, 9

4.2 HOSPITAL PHARMACY (PRACTICALS)

Theory: 75 Hours (3 Hrs/Week)

Responsible Member of the academic staff: Dr. Umesh M (UM)

1. Assessment of drug interactions in the given prescriptions
2. Manufacture of parenteral formulations and powders.
3. Drug information queries.
4. Inventory control

List of Assignments:

1. Design and Management of Hospital pharmacy department for a 300 bedded hospital.
2. Pharmacy and Therapeutics committee – Organization, functions, and limitations.
3. Development of a hospital formulary for 300 bedded teaching hospital
4. Preparation of ABC analysis of drugs sold in one month from the pharmacy.
5. Different phases of clinical trials with elements to be evaluated.
6. Various sources of drug information and systematic approach to provide unbiased drug information.
7. Evaluation of prescriptions generated in hospital for drug interactions and find out the suitable management.

Special requirements:

1. Each college should sign MoU with nearby local hospital having minimum 150 beds for providing necessary training to the students' on hospital pharmacy activities.
2. Well equipped with various resources of drug information.

Scheme of Practical Examination:

	Sessionals	**Annual**
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max Marks	**20**	**70**
Duration	**03 hrs**	**04 hrs**

Note: Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

4.3 CLINICAL PHARMACY (THEORY)

Theory: 3 Hrs. /Week

Responsible member/s of the academic staff: Mr B. R. Jaidev Kumar (BRJ)

Scope and Objectives: This course is designed to impart the basic knowledge and skills that required for practice of pharmacy including provision of various clinical pharmacy services to patients and healthcare professionals in clinical settings.

Upon completion of the course, students will be able to:
(Student learning outcomes)
Theory:

1. Describe the role of clinical pharmacist in providing pharmaceutical care
2. Explain the process of various Clinical pharmacy activities (medication history interview, medication chart review etc) and list various medication related problems
3. Interpret and correlate laboratory parameters with respective disease conditions
4. Explain the process of detection, reporting and management of ADRs
5. Evaluate various literatures critically with respect to their strength of evidence

Practical:

1. Synthesize and provide Drug information from various resources in unbiased and succinct form.
2. Counsel the patient for safe and effective use of medication
3. Conduct an effective and methodical patient medication history interview.

Teaching/learning methodologies used:

1. Lecture
2. Practical/Lab
3. Discussion

Course Materials

TEXT BOOKS

a. Practice Standards and Definitions, The Society of Hospital Pharmacists of Australia.
b. Basic skills in interpreting laboratory data, Scott LT, American Society of Health System Pharmacists Inc.
c. Biopharmaceutics and Applied Pharmacokinetics, Leon Shargel, Prentice Hall Publication
d. Textbook of Clinical Pharmacy Practice; Essential concepts and skills, Dr. G.Parthasarathi, Karin Nyfort-Hansen, Milap Nahata, Orient Longman Pvt. Ltd.

REFERENCE BOOKS

a. Australian drug information -Procedure manual. The Society of Hospital Pharmacists of Australia.
b. Clinical Pharmacokinetics - Rowland and Tozer, Williams and Wilkins Publication.
c. Pharmaceutical statistics. Practical and clinical applications. Sanford Bolton, Marcel Dekker, Inc.

Lecture wise programme:

No.	Topic	Hrs
1	**Definitions, development and scope of clinical pharmacy**	03
2	**Introduction to daily activities of a clinical pharmacist** a. Drug therapy monitoring (medication chart review, clinical review, pharmacist interventions) b. Ward round participation c. Adverse drug reaction management d. Drug information and poisons information e. Medication history f. Patient counselling g. Drug utilisation evaluation (DUE) and review (DUR) h. Quality assurance of clinical pharmacy services	13
3	**Patient data analysis** The patient's case history, its structure and use in evaluation of drug therapy & understanding common medical abbreviations and terminologies used in clinical practices.	03
4	**Clinical laboratory tests used in the evaluation of disease states, and interpretation of test results** • Haematological, Liver function, Renal function, thyroid function tests • Tests associated with cardiac disorders • Fluid and electrolyte balance • Microbiological culture sensitivity tests • Pulmonary Function Tests	15
5	**Drug & Poison information** • Introduction to drug information resources available • Systematic approach in answering DI queries • Critical evaluation of drug information and literature • Preparation of written and verbal reports • Establishing a Drug Information Centre • Poisons information- organization & information resources	08
6	• **Pharmacovigilance** • Scope, definition and aims of pharmacovigilance • Adverse drug reactions - Classification, mechanism, predisposing factors, causality assessment [different scales used], • Reporting, evaluation, monitoring, preventing & management of ADRs • Role of pharmacist in management of ADR.	10

7	• Communication skills, including patient counseling techniques, medication history interview, presentation of cases.	**10**
8	• Pharmaceutical care concepts	**04**
9	• Critical evaluation of biomedical literature	**06**
10	• Medication errors	**03**

Theory Sessional examination syllabus

Sessional No	Chapters no
I	1, 2, 9, 10
II	4, 6
III	3, 5, 7, 8

4.3 CLINICAL PHARMACY (PRACTICALS)

Theory: 75 Hours (3 Hrs/Week)

Responsible member/s of the academic staff: Mr. B. R. Jaidev Kumar (BRJ)

Students are expected to perform 15 practical in the following areas covering the topics dealt in theory class.

- Answering drug information questions (4 Nos)
- Patient medication counselling (4 Nos)
- Case studies related to laboratory investigations (4 Nos)
- Patient medication history interview (3 Nos)
-

ASSIGNMENT

Students are expected to submit THREE written assignments (1500 – 2000 words) on the topics given to them covering the following areas dealt in theory class.

Drug information, Patient medication history interview, Patient medication counseling, Problem solving in Clinical Pharmacokinetics, Therapeutic drug monitoring and Critical appraisal of recently published articles in the biomedical literature which deals with a drug or therapeutic issue.

Format of the assignment

- Minimum & Maximum number of pages.
- Reference(s) shall be included at the end.
- Assignment can be a combined presentation at the end of the academic year.
- It shall be computer draft copy
- Name and signature of the student
- Time allocated for presentation may be 8+2 min

Scheme of Practical Examination

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Max Marks	**20#**	**70**
Duration	**03 hrs**	**04 hrs**

#**Note:** Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

4.4 BIOSTATISTICS AND RESEARCH METHODOLOGY (THEORY)

Theory: 2 hrs /week

Responsible Member of the academic staff: Mr. D.H.Panchaksharappa Gowda (DHP)

Scope and Objective: This is an introductory course in statistics, research methodology and Computer application in hospital and community Pharmacy. This subject deals with Research methodology, Biostatics, epidemiology and Computer application and clinical studies.

Research methodology deal about types of clinical study, designing, sample size determination and power of study Statistics deals about frequency distribution, graphics, averages, measures of dispersion, Correlation, regression, Parametric and non-parametric tests. Incidence and prevalence, relative risk, attributable risk. Computer Application deals with application of Computer System in Hospital Pharmacy and Community Pharmacy

At completion of this course it is expected that student will able to:
(Student learning outcomes)
Theory:

1. Describe the various type of clinical study designs and research methodology
2. Explain the different statistical methods used to analyse the research data
3. Discuss importance of computer applications in pharmacy

Teaching / learning methodologies used:

1. Lecture
2. Discussion

Course material:

REFERENCE BOOKS:

a. Pharmaceutical statistics- Practical and clinical applications, Sanford Bolton 3rd and 4th edition, publisher Marcel Dekker Inc. NewYork.
b. Drug Information- A Guide for Pharmacists, Patrick M Malone, Karen L Kier, John E Stanovich , 3rd edition, McGraw Hill Publications 2006
c. Computer Application in Pharmacy – William E. Fassett, publisher – Lea & Febiger. Philadelphia

Lecture wise Programme :

Note: To emphasis also on definition, examples and application in Pharmacy

Topic	Hrs
Research Methodology	
a) Types of clinical study designs: Case studies, observational studies, interventional studies,	**10**
b) Designing the methodology	
c) Sample size determination and Power of a study, Determination of sample size for simple comparative experiments, determination of sample size to obtain a confidence interval of specified width, power of a study	
d) Report writing and presentation of data	

Biostatistics

a) Introduction **10**
b) Types of data distribution
c) Measures describing the central tendency distributions- average, median, mode
d) Measurement of the spread of data-range, mean deviation, standard deviation, variance, coefficient of variation, standard error of mean.

Data graphics : Construction and labeling of graphs, histogram, Pie charts, scatter plots, semi-logarithmic graphs **02**

Basics of testing hypothesis : **15**

a) Null hypothesis, level of significance, power of test, P value, statistical estimation of confidence intervals.
b) Level of significance (Parametric data)- students t test (paired and unpaired), Analysis of Variance (one-way and two-way)
c) Level of significance (Non-parametric data)- Chi Square test, Sign test, Wilcoxan's signed rank test, Wilcoxan rank sum test, Mann Whitney U test, Kruskal-Wall's test (one way ANOVA)
d) Linear regression and correlation- Introduction, Pearson's and Spearman's correlation and correlation co-efficient.
e) Introduction to statistical software: SPSS, Epi Info, SAS.

Statistical methods in epidemiology **05**

Incidence and prevalence, relative risk, attributable risk

Computer applications in pharmacy **08**

Computer System in Hospital Pharmacy:

Patterns of Computer use in Hospital Pharmacy – Patient record database management, Medication order entry – Drug labels and list – Intravenous solution and admixture, patient medication profiles, Inventory control, Management report & Statistics.

Computer In Community Pharmacy

Computerizing the Prescription Dispensing process
Use of Computers for Pharmaceutical Care in community pharmacy
Accounting and General ledger system

Drug Information Retrieval & Storage :

Introduction – Advantages of Computerized Literature Retrieval,
Use of Computerized Retrieval

Theory Sessional Examination Syllabus

Sessional No.	Syllabus
I	Topics 2.1,2.2 & 2.4
II	Topics 1 & 3
III	Topic 2.3

1.5 BIOPHARMACEUTICS AND PHARMACOKINETICS (THEORY)

Theory: 3 Hrs. /Week

Responsible member/s of the academic staff: Dr. P.K. Kulkarni (PKK)

Scope and Objectives: This course is designed to impart knowledge and skills necessary for dose calculations, dose adjustments and to apply biopharmaceutics theories in practical problem solving. Basic theoretical discussions of the principles of biopharmaceutics and pharmacokinetics are provided to help the students' to clarify the concepts.

At completion of this course it is expected that students will be able to understand: (Student learning outcomes)

Theory:

1. Identify the physiological, physicochemical and dosage form-related factors that affects drug absorption from different dosage forms.
2. Critically evaluate biopharmaceutics studies involving drug product equivalency
3. Evaluate the in vitro-in vivo correlation for different drug products.
4. Assess the absolute and relative bioavailability of drugs from different dosage forms using either plasma or urine data.
5. Explain the basic concepts of pharmacokinetics and biopharmaceutics and Describe the different pharmacokinetic models.
6. Determine the basic pharmacokinetic parameters that describe drug absorption and disposition and Recognize the age, weight, sex and genetic related factors that can cause pharmacokinetic variability.

Practical:

1. Demonstrate the dissolution behavior of poorly water soluble drugs and factors influencing dissolution
2. Handle the semi-log and standard graph papers, and distinguish the resulted curves generated by ordered processes, and ability to calculate slopes and intercepts to extract pharmacokinetic processes according to the model under question.
3. Use raw data and derive the pharmacokinetic models and parameters that best describe the process of drug absorption, distribution and elimination.
4. Calculate the area under the curve, bioavailability and bioequivalence.

Teaching/Learning methodologies used:

1. Lecture
2. Practicals/Lab

Course materials

TEXT BOOKS

a. Biopharmaceutics and Clinical Pharmacokinetics by, Milo Gibaldi.
b. Biopharmaceutics and Pharmacokinetics; By Robert F Notari
c. Applied biopharmaceutics and pharmacokinetics, Leon Shargel and Andrew BC. 4th edition, Prentice-Hall Inernationaledition.USA

d. Bio pharmaceutics and Pharmacokinetics-A Treatise, By D. M. Brahmankar and Sunil B.Jaiswal, VallabhPrakashanPitampura, Delhi

REFERENCE BOOKS

a. Pharmacokinetics: By Milo Glbaldi Donald, R. Mercel Dekker Inc.
b. Hand Book of Clinical Pharmacokinetics, By Milo Gibaldi and Laurie Prescott by ADIS
c. Health Science Press.
d. Biopharmaceutics; By Swarbrick
e. Cilincal Pharmacokinetics, Concepts and Applications: By Malcolm Rowland and Thomas, N. Tozen, Lea and Febrger, Philadelphia, 1995.
f. Dissolution, Bioavailability and Bioequivalence, By Abdou H.M, Mack, Publishing Company, Pennsylvania 1989.
g. Biopharmaceutics and Clinical Pharmacokinetics-An introduction 4th edition Revised and expanded by Robort F Notari Marcel Dekker Inn, New York and Basel, 1987.
h. Remington's Pharmaceutical Sciences, By Mack Publishing Company, Pennsylvnia

Lecture-wise programme

Topic	Hrs
Biopharmaceutics	**01**
Introduction to biopharmaceutics	
Absorption	**08**
Mechanisms of drug absorption through GIT, factors influencing drug absorption though GIT, absorption of drug from Non *per OS* extra-vascular routes	
Distribution of drugs	**08**
Tissue permeability of drugs, binding of drugs, apparent volume of drug distribution, protein binding of drugs, factors affecting protein –drug binding. Kinetics of protein binding, Clinical significance of protein bin-drug binding	
Drug Elimination	**06**
Biotransformation of drugs, renal excretion of drugs , factors affecting renal excretion of drugs, renal clearance, Non renal routes of drug excretion of drugs	
Bioavailability and Bioequivalence	**10**
Objectives of bioavailability studies, absolute and relative bioavailability, measurement of bioavailability, *in-vitro* drug dissolution models, *in-vitro in-vivo* correlations, bioequivalence studies, methods to enhance the bioavailability	
Pharmacokinetics	**05**
Introduction to Pharmacokinetics. Mathematical model. Drug levels in blood Pharmacokinetic models, Compartment models, Non-compartment models, Physiological models	
One compartment open model	**15**
Intravenous Injection (Bolus), Intravenous infusion, Extra vascular administrations, calculations of Ka, KE. From plasma and urinary excretion data	
Multi compartment models	**08**
Two compartment open model. IV bolus, IV infusion and oral administration	
Multiple – Dosage Regimens:	**10**
Repititive Intravenous injections – One Compartment Open Model, Repetitive Extravascular dosing – One Compartment Open model, Multiple Dose Regimen – Two Compartment Open Model	
Nonlinear Pharmacokinetics	**05**
Introduction, Factors causing Non-linearity, Michaelis- menton method of estimating	

parameters

Non-compartmental Pharmacokinetics. **04**

Statistical Moment Theory, MRT for various compartment models ,Physiological Pharmacokinetic model

Theory Sessional examination syllabus

Sessional No.	**Syllabus**
	Chapters no.
I	1, 2, 3 and 4
II	5, 6 and 7
III	7, 8, 9, 10 and 11

4.5 BIOPHARMACEUTICS AND PHARMACOKINETICS (PRACTICALS)

Practical: 75 Hours (3 Hrs/Week)

Responsible member/s of the academic staff: Dr. P.K. Kulkarni (PKK)

List of experiments

1. Improvement of dissolution characteristics of slightly soluble drugs by co-solvency
2. Improvement of dissolution characteristics of slightly soluble drugs by solid dispersion
3. Improvement of dissolution characteristics of slightly soluble drugs by use of surfactant
4. Comparison of dissolution studies of two different marketed products of same drug.
5. Influence of polymorphism on solubility and dissolution
6. Protein binding studies of a drug.
7. Calculation of bioavailability
8. Calculation of Ka, Ke, $t_1/2$, Cmax, AUC, AUMC, MRT etc. from blood profile data.
9. Calculation of bioavailability from urinary excretion data for two drugs.
10. Calculation of elimination half-life for different drugs by using urinary elimination data and blood level data
11. Calculation of AUC and bioequivalence from the given data for two drugs
12. Absorption studies in animal inverted intestine using various drugs.
13. Studying metabolic pathways for different drugs based on elimination kinetics data
14. Calculation of renal clearance

. Scheme of Practical Examination

	Sessionals	**Annual**
Synopsis	04	15
Major Experiment	08	25
Minor Experiment	04	15
Viva	04	15
Max Marks	**20***	**70**
Duration	**03 hrs**	**04 hrs**

***Note:** Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance)

4.6 CLINICAL TOXICOLOGY (THEORY)

Theory: 2 Hrs. /Week

Responsible member/s of the academic staff: Dr. U.R. Rakshith (URR)

Scope and Objectives: This course is designed to impart a thorough knowledge in the management of various poisoning cases thereby enabling the students to assist healthcare professionals / toxicologists in handling and managing the emergency cases.

At completion of this course it is expected that students will be able to:

(Student learning outcomes)

Theory:

- Explain the general principles involved in the management of poisoning
- Describe the clinical symptoms and management of acute and chronic poisoning
- Discuss the signs and symptoms of substance abuse and treatment of dependence

Teaching/learning methodologies used:

1. Lecture
2. Discussion
3. Case study

Course materials:

REFERENCE BOOKS

a. Matthew J Ellenhorn. Ellenhorns Medical Toxicology – Diagnosis and Treatment of Poisoning. Second edition. Williams and Willkins publication, London
b. Modern medical toxicology, Author V. V. Pillay, Publisher: JP Brothers
c. Pediatric toxicology diagnosis and management of the poisoned child, Timothy B, Erickson, William R. Athrens, Steven.E. AK, Cart K.Baun,Louis J.Ling. Mcgraw-Hill; 2005.
d. Lindsay Murray, Frank Dary, Mark little, Mikes Cadogan, editors. Toxicology handbook. Australia: Churchil Livingstone, Elsevier; 2007

Lecture-wise program

	Topic	Hrs
I	General principles involved in the management of poisoning	**02**
II	Antidotes and the clinical applications	**01**
III	Supportive care in clinical Toxicology	**02**
IV	Gut Decontamination	**02**
V	Elimination Enhancement	**01**
VI	Toxicokinetics.	**02**
VII	Clinical symptoms and management of acute poisoning with the following agents	
	a) Pesticide poisoning: organophosphorous compounds, carbamates, organochlorines, pyrethroids	**05**
	b) Opiates overdose.	**01**
	c) Antidepressants	**03**
	d) Barbiturates and benzodiazepines	**03**
	e) Alcohol: ethanol, methanol	**02**
	f) Paracetamol and salicylates	**02**
	g) Non-steroidal anti-inflammatory drugs	**02**
	h) Hydrocarbons: Petroleum products and PEG.	**01**
	i) Caustics: inorganic acids and alkali	**01**
	j) Radiation poisoning	**01**
VIII	Clinical symptoms and management of chronic poisoning with the following agents - Heavy metals: Arsenic, lead, mercury, iron, copper	**05**
IX	Venomous snake bites: Families of venomous snakes, clinical effects of venoms, general management as first aid, early manifestations, complications and snakebite injuries	**02**
X	Plants poisoning. Mushrooms, Mycotoxins	**02**
XI	Food poisonings	**01**
XII	Envenomations – Arthropod bites and stings	**01**
XIII	**Substance abuse:**	
	Signs and symptoms of substance abuse and treatment of dependence	
	a) CNS stimulants : Amphetamine	**01**
	b) Opioids	**01**
	c) CNS depressants	**02**
	d) Hallucinogens: LSD	**01**
	e) Cannabis group	**02**
	f) Tobacco	**01**

Theory Sessional examination syllabus

Sessional No.	Syllabus Chapters No.
I	1 to 7 a
II	7b-7J
III	8 to 13

4.7 PHARMACOTHERAPEUTICS I & II (THEORY)

Theory: 3 Hrs. /Week

Responsible member/s of the academic staff: Mr. Krishna Undela (KU)

Scope and Objectives: This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management

At completion of this course it is expected that students will be able to:
(Student learning outcomes)
Theory:

1. Describe the etiopathogenesis of selected diseases and correlate them to clinical condition(s) of the respective disease.
2. Explain the general therapeutic approach to management of selected diseases.
3. Apply the knowledge to justify the clinical controversies and rationale in individualizing drug therapy plans.
4. Distinguish the management strategies of selected diseases in special populations.
5. Assess drug safety monitoring, contraindications and treatment outcomes and modify treatment plan as needed.

Practical:

1. Gather and analyse patient medical records and prepare pharmaceutical care plan.
2. Perform treatment chart review and identify medication related problems (MRPs).
3. Communicate and resolve MRPs to concerned health care professionals.
4. Perform the patient medication counselling as per the requirement of the patient and/or recommended by a clinician.

Teaching/learning methodologies used:

1. Lecture
2. Practical/Lab
3. Discussion
4. Case Study

Course materials

TEXT BOOKS

a. Clinical Pharmacy and Therapeutics – Roger Walker and Cate Whittlesea, Churchill Livingstone Publication.
b. Pharmacotherapy: A Pathophysiologic approach - Joseph T. Dipiro et al. Appleton & Lange.

REFERENCE BOOKS

a. Pathologic basis of disease - Robins SL, *et al.* W.B.Saunders Publication.
b. Pathology and Therapeutics for Pharmacists: A Basis for Clinical Pharmacy Practice - Green and Harris, Chapman and Hall publication.
c. Clinical Pharmacy and Therapeutics - Eric T. Herfindal, Williams and Wilkins Publication.
d. Applied Therapeutics: The clinical Use of Drugs. Lloyd Young and Koda-Kimble MA.
e. Avery's Drug Treatment, 4th Edn, 1997, Adis International Limited.

f. Relevant review articles from recent medical and pharmaceutical literature.

Lecture wise Programme

Etiopathogenesis and pharmacotherapy of diseases associated with following systems/ diseases

	Topic	Hrs
1.	**Cardiovascular system** Hypertension, Congestive cardiac failure, Angina Pectoris, Myocardial infarction, , Hyperlipidemia , Electrophysiology of heart and Arrhythmias.	13
2.	**Respiratory system** Introduction to Pulmonary function test, Asthma, Chronic obstructive airways disease, Drug induced pulmonary diseases.	06
3.	**Endocrine system** Diabetes, Thyroid diseases, Oral contraceptives, Hormone replacement therapy, Osteoporosis	08
4.	**General prescribing guidelines for** a. Paediatric patients b. Geriatric patients c. Pregnancy and breast feeding	04
5.	**Ophthalmology:** Glaucoma, Conjunctivitis- viral & bacterial.	03
6.	**Introduction to rational drug use** Definition, Role of pharmacist Essential drug concept Rational drug formulations.	02
7.	**Infectious disease:** Guidelines for the rational use of antibiotics and surgical Prophylaxis, Tuberculosis, Meningitis, Respiratory tract infections, Gastroenteritis, Endocarditis, Septicemia, Urinary tract infections, Protozoal infection- Malaria, HIV & Opportunistic infections, Fungal infections, Viral infections, Gonarrhoea and Syphillis.	18
8.	**Musculoskeletal disorders** Rheumatoid arthritis, Osteoarthritis, Gout, Spondylitis, Systemic lupus erythematosus.	06
9.	**Renal system** Acute Renal Failure, Chronic Renal Failure, Renal Dialysis, Drug induced renal disorders.	05
10.	**Oncology:** Basic principles of Cancer therapy, General introduction to cancer chemotherapeutic agents, Chemotherapy of breast cancer, leukemia. Management of chemotherapy nausea and emesis.	06
11.	**Dermatology:** Psoriasis, Scabies, Eczema, Impetigo.	04

Theory Sessional Examination Syllabus

Sessional No.	Syllabus
I	Topics 1, 2 & 3
II	Topics 4, 5, 6, & 7

III	Topics 8, 9,10, & 11

4.7 PHARMACOTHERAPEUTICS I & II (PRACTICALS)

Theory: 75 Hours (3 Hrs/Week)

Responsible member/s of the academic staff: Mr. Krishna Undela (KU)

Hospital postings in various departments designed to complement the lectures by providing practical clinical discussion; attending ward rounds; follow up the progress and changes made in drug therapy in allotted patients; case presentation upon discharge. Students are required to maintain a record of cases presented and the same should be submitted at the end of the course for evaluation. A minimum of 15 cases should be presented and recorded covering most common diseases.

ASSIGNMENTS

Students are required to submit written assignments on the topics given to them. Topics allotted should cover recent developments in drug therapy of various diseases. A minimum of THREE assignments [1500 – 2000 words] should be submitted for evaluation.

Assignments
Format of the assignment

- Minimum & Maximum number of pages
- It shall be computer draft copy
- Reference(s) shall be included at the end in Vancouver style
- It should be in the 'Times New Roman' word format with a word size of '12'
- Name and signature of the student
- Assignment can be a combined presentation at the end of the academic year
- Time allocated for presentation may be 8+2 Min

Scheme of Practical Examination

	Sessional	Annual
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15

Viva	02	15
Max Marks	**20**	**70**
Duration	**03 hrs**	**04 hrs**

**** Total sessional marks are 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance)***

Modified Schedule and Link for Online Classes – PharmD

(w.e.f 01-06-2020)

PharmD – Fourth Year

Day	02:00 PM to 02:50 PM	03:00 PM to 03:50 PM	04:00 PM to 04:50 PM
Mon	Pharmacotherapeutics-III	Hospital Pharmacy	Clinical Pharmacy
Tue	Biostatistics & Research Methodology	Biopharmaceutics & Pharmacokinetics	Clinical Toxicology
Wed	Pharmacotherapeutics-III	Biopharmaceutics & Pharmacokinetics	Biostatistics & Research Methodology
Thu	Biostatistics & Research Methodology	Hospital Pharmacy	Clinical Toxicology
Fri	Pharmacotherapeutics-III	Biopharmaceutics & Pharmacokinetics	Clinical Pharmacy

JSS Academy of Higher Education & Research
JSS College of Pharmacy
Sri Shivarathreeshwara Nagara, Mysore-570015
CLASS TIME TABLE- 2020-21

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

Class: PHARM. D –FOURTH YEAR

Time / Day	9.00-9.50AM	9.50-10.40AM	TEA BREAK	11.10-12.05PM	12.05–1.00PM	LUNCH BREAK	2.00-2.55PM	2.55-3.50PM	TEA BREAK	4.05-5.00PM	5.00-5.55 PM
Monday	Pharmaco Therapeutics-I & II (Tu) KU	Hospital Pharmacy (Tu) UM		Pharmaco Therapeutics-I & II KU	Hospital Pharmacy UM		←BI------ UM ---------- Hospital ←BI---------- SP ---- Pharmaco			Pharmacy ---→ Ther-III --- --→	---------
Tuesday	Clinical Pharmacy BRJ	←--BI------ BRJ ←BII ---PKK --		---------- Clinical Pharmacy-------→ Biopharmaceutics& P.Kinetics------→			Clinical Pharmacy BRJ	Biopharmaceutics & Pharmacokinetics PKK		Clinical Pharmacy BRJ	---------
Wednesday	---------	←--BI------PKK ←BII ---KU------		Biopharmaceutics& P.kinetics------→ Pharmaco Therapeutics-I & II -----→			Pharmaco Therapeutics-I & II KU	Biostastistics & Research Methodology (Tu) DHP		Pharmaco Therapeutics-I & II KU	---------
Thursday	Biostastistics & Research Methodology DHP	←BII-- -- UM-		---------- Hospital Pharmacy-----→			Hospital Pharmacy UM	Pharmaco Thera-III SP		Pharmaco Therapeutics-III SP	Clinical Toxicology (Tu) URR
Friday	Biostastistics & Research Methodology DHP	Pharmaco Therapeutics-III SP		Biopharmaceutics & Pharmacokinetics PKK	Pharmaco Therapeutics-III (Tu) SP		Clinical Toxicology URR	Clinical Toxicology URR		Biopharmaceutics & Pharmacokinetics PKK	---------
Saturday	Clinical Pharmacy BRJ	←BI -----SP --- ←BII------ BRJ		Pharmaco Therapeutics-III ------→ --------Clinical Pharmacy-------→			----------				

***Effective from: 24th June 2020**

Note: 1. No tea break for practicals

Time table Coordinator **Principal**

Copy: SNB/LNB/SCF/e.copy – teachers/ Office in charge – time table / Time table coordinator

QPC8.1SOP(2)\F(1) 0