

JSS Academy of Higher Education and Research

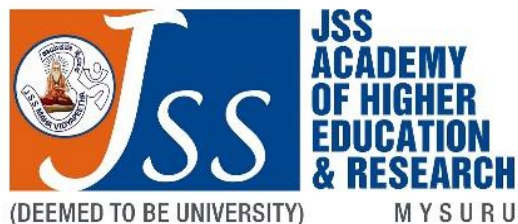
## JSS College of Pharmacy

Sri Shivarathreshwara Nagara, Mysuru-570015

Ph: 0821-2548353, Fax: 0821-2548359, Email: [jsscpsy@jssuni.edu.in](mailto:jsscpsy@jssuni.edu.in)

Website: [www.jssuni.edu.in](http://www.jssuni.edu.in)

**An ISO 9001:2015 Certified Institution**



### B. Pharm - IV Semester Course Handout 2021-22



Ranked 1<sup>st</sup> among  
the YOUNG  
UNIVERSITIES in  
Karnataka



JSS College of  
Pharmacy,  
Mysuru - 9<sup>th</sup>  
Rank in INDIA  
2021



INTERNATIONAL  
CERTIFICATION  
Pharm D Program is  
Certified by Accreditation  
Council for Pharmacy  
Education (ACPE), USA

	<b>A+</b>	<b>34<sup>th</sup></b> (University Category)	261-270 31 <sup>st</sup> in INDIA	351- 400 2 <sup>nd</sup> in INDIA Subject Ranking Clinical & Health 93 1 <sup>st</sup> in INDIA	<b>2020 Band A</b> Rank Band 6 to 25
	JSS Medical College - 24 <sup>th</sup> ★ JSS Dental College & Hospital - 12 <sup>th</sup> ★ JSS College of Pharmacy, Mysuru - 9 <sup>th</sup> ★ JSS College of Pharmacy, Ooty - 7 <sup>th</sup>				



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## JSS College of Pharmacy

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An ISO 9001:2008 Certified Institution

Accredited 'A+' Grade by NAAC

### 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.
- To 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

### STRATEGIC PLAN 2020-2025

- JSS Academy of higher Education & Research, College of Pharmacy, will position themselves as the **SMART** Colleges of Pharmacy In the Country by 2025 by developing and advancing

<b>S</b>	Student Quality
<b>M</b>	Motivation
<b>A</b>	Academic Excellence
<b>R</b>	Research & Innovation
<b>T</b>	Technology

## Academic Calendar 2021-22 (B. Pharm – IV Semester)

### 1. Commencement of Classes

**B. Pharm – IV Semester**

- 23<sup>rd</sup> February, 2022

### 2. Sessional Examination Schedule

I	II
Theory - 5 <sup>th</sup> week of April 2022	Theory - 4 <sup>th</sup> week of June 2022
Practical - 4 <sup>th</sup> week of April 2022	Practical – 3 <sup>rd</sup> week of June 2022

### 3. Closure of Term

- 1<sup>st</sup> week of July 2022 (Tentative dates)

### End semester Examination

- 2<sup>nd</sup> week of July 2022 (Tentative dates)

#### Teacher's In charge

Class	Class Teacher	Batch No.	Batch Teacher
II B.Pharm IV Semester	Mrs. Preethi. S	I	Dr. N Paramakrishnan
		II	Dr. Rupshee jain
		III	Dr. Durai Anand Kumar
		IV	Mrs. Preethi. S

## ACTIVITIES AND COORDINATORS 2021-22

### 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	MR
5.	Industrial Visits, Training and placements	TS/ABP
6.	Guest lecture & Seminar/ conference/ training / workshop/Webinar <ul style="list-style-type: none"> <li>• organized at college</li> <li>• delivered/attended by staff</li> </ul>	Respective department all HODs/Program coordinators/organizing secretary
7.	Internal Assessment Committee Chairperson Members	GVP RSS/AKT/DAK/BMV
8.	<ul style="list-style-type: none"> <li>• Academic Council Board</li> <li>• Identification of Advanced/ Medium/ Slow learners</li> </ul>	Class Teachers Subject Teachers

9.	Ethics committee Meeting <ul style="list-style-type: none"> <li>• Animal</li> <li>• Human</li> </ul>	KLK MR
10.	Time table	DHP TS/ URR/DT/HYK
11.	Internal Quality Assurance Cell Chairperson Members	TMP/HVG / AMM/AKT/RSC/SP/JS
12.	Women's cell (Prevention of Sexual Harassment Cell)	SNM
13.	Scholarship Bureau	RSC/program coordinators/Class teachers
14.	Compilation of publications (Research papers/books/chapters)	BMG
15.	Research Coordination Committee -Compilation of Ph.D details and funded projects - Review of publications	Chairperson – DVG Members – SB/ BRP/JS/JUS
16.	APC (Plagiarism)	Chairperson –TMP Member Secretary-BRP Member-HVG
17.	Pharmacy Education Unit (CCLPE)	MSS/AS
18.	Annual result analysis List of merit students	UG – Subject Teacher, Class teacher & Program committee PG – Course Coordinator & Abhishek (Office)
19.	GPAT and other competitive exams (TOEFL, GRE etc.)	BM/ CSH/MPG/ Class teacher
20.	Library orientation	Librarian
21.	Soft Skills Training	ABP/CIA

### Extracurricular activities

Sl. No.	Activities	Coordinator/s
22.	<ul style="list-style-type: none"> <li>• Selection of Class Representatives, Pharmaceutical society members</li> <li>• Annual planning and execution of Student centered and professional activities including inauguration of IPS</li> </ul>	MSS/ SRD
23.	JASPHARM	BS/ SM / CSH
24.	STUMAG	HYK/ CIA
25.	Sports coordinators	MPV/HKS
26.	NSS coordinators	MPG / UM/ SND
27.	Cultural & Literary coordinators	KNS/ CIA

### Other Institutional activities

Sl. No.	Activities	Coordinator/s
28.	Annual Day celebration / Graduation day	DAT/SM
29.	Course handouts/ Teachers diary/ Student handbook/Faculty handbook	HYK/PS
30.	National Pharmacy Week (NPW) & Pharmacists Day	VJ/ UM + IPA team
31.	Alumni association	HVG/ AKT/SM/BS
32.	Herbal and College Garden	JS/ NPK
33.	ISO	DHP/SNM
34.	Press and publicity	KLK /BMV/OFFICE
35.	Foreign students cell	MPV
36.	Governing council meeting	JUS/ Office
37.	Monthly/Annual report of college activities to JSS AHER and other agencies	HoDs/PG Coordinators/JUS/ST/RSC/AM/ HG, Asha (office)
38.	College website	HKS/BS
39.	Research & Consultancy Co-ordinator • Collaboration with Industries/organizations • Interdepartment/Interdisciplinary research	DVG/ SB/ KM
40.	Coordinator - JSSUonline.com	ABP/TS
41.	JSSU Newsletter	KLK/SRD/ KNS
42.	Annual group photo session	MSS/ SRD
43.	Lab coat and Blazers	JS / Ningaraju
44.	Notice Board (SNB, LNB and IIPC), Departmental staff list	Nagaraju
45.	Stock verification	Office staff /Librarian
46.	Student Liaison	Divya S
47.	Student ID Cards /Attendance entry	Shivanna / Manjunath
48.	Retreat for Pharmacy Students	AKT/ HKS/BRJ
49.	Feedback	VJ
50.	Institute Innovation Cell	HVG/DAK/BM
51.	Practice School	MPG/ST

### Program Committee

Sl. No.	Program committees	Chairperson	Member Secretary
52.	D.Pharm	BMV	URR
53.	B.Pharm	GVP	DAT
54.	Pharm.D	MR	RSS
55.	M.Pharm	SNM	AKT
56.	B.Pharm – Practice	MR	BS
57.	PG Diploma	JS	BM

**M.Pharm Program Coordinators**

<b>Sl. No.</b>	<b>M.Pharm Program</b>	<b>Coordinator</b>
58.	Pharmaceutics	VJ
59.	Industrial Pharmacy	ABP
60.	Pharmaceutical Regulatory Affairs	MPV
61.	Pharmaceutical Quality Assurance	HVG
62.	Pharmaceutical Chemistry	BRP
63.	Pharmaceutical Analysis	AKT
64.	Pharmacology	KLK
65.	Pharmacognosy	NPK
66.	Pharmacy Practice	SP
67.	Pharmaceutical Biotechnology	JS

**PG Diploma Program Coordinators**

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

**Certificate Course Coordinators**

<b>Sl. No.</b>	<b>Certificate Course</b>	<b>Coordinator</b>
80.	Pharmaceutical Quality Assurance	HKS
81.	Herbal Drug Standardization	JS
82.	Medicine Information	RSS
83.	Clinical Research	JUS
84.	Global Regulatory Affairs	MPV

## 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. D. Vishakante Gowda (DVG)	M.Pharm., Ph.D.	Professor & Head	Pharmaceutics
3.	Dr. Balamuralidhara V. (BMV)	M.Pharm., Ph.D.	Assoc. Professor	Pharmaceutics
4.	Dr. Gangadharappa H.V. (HVG)	M.Pharm., Ph.D.	Assoc. Professor	Pharmaceutics
5.	Dr. M.P. Venkatesh (MPV)	M.Pharm., Ph.D.	Assoc. Professor	Pharmaceutics
6.	Dr. Vikas Jain (VJ)	M.Pharm., Ph.D.	Assoc. Professor	Pharmaceutics
7.	Dr. Amit B Patil (ABP)	M.Pharm., Ph.D.	Assoc. Professor	Pharmaceutics
8.	Dr. Gowrav M P (MPG)	M.Pharm., Ph.D.	Asst. Professor	Pharmaceutics
9.	Mr. Hemanth Kumar S (HKS)	M.Pharm	Asst. Professor	Pharmaceutics
10.	Dr. Riyaz Ali Osmani (RAO)	M.Pharm., Post. Doc.	Asst. Professor	Pharmaceutics
11.	Ms. 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.	Ms. Preethi S (PS)	M.Pharm	Lecturer	Pharmaceutics
15.	Dr. M. Ramesh (MR)	M.Pharm., Ph.D.	Professor & Head	Pharmacy Practice
16.	Ms. Shilpa Palaksha (SP)	M.Pharm.	Assoc. Professor	Pharmacy Practice
17.	Dr. Savitha R S (RSS)	M.Pharm.	Assoc. Professor	Pharmacy Practice
18.	Mr. D.H. P. Gowda (DHP)	M.Sc., PGDCA.	Asst. Professor	Pharmacy Practice
19.	Dr. M Umesh (UM)	Pharm D.	Asst. Professor	Pharmacy Practice
20.	Dr. Juny Sebastian (JUS)	M.Pharm., Ph.D.	Asst. Professor	Pharmacy Practice
21.	Dr. Sri Harsha Chalasani (CSH)	M.Pharm., Ph.D.	Asst. Professor	Pharmacy Practice
22.	Dr. Jaidev Kumar B R (BRJ)	M.Pharm.	Lecturer	Pharmacy Practice
23.	Dr. Srikanth M S (MSS)	M.Pharm., Ph.D.	Lecturer	Pharmacy Practice
24.	Mr Balaji S (BS)	M.Pharm	Lecturer	Pharmacy Practice
25.	Dr. U R Rakshith (URR)	Pharm D	Lecturer	Pharmacy Practice
26.	Dr. Acsah Annie Paul (AAP)	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. R. S. Chandan (RSC)	M.Pharm., Ph.D.	Assoc. Professor	Pharma. Chemistry
30.	Dr. Prashantha Kumar B R (BRP)	M.Pharm., Ph.D.	Assoc. Professor	Pharma. Chemistry
31.	Dr. Anand Kumar Tengli (AKT)	M.Pharm., Ph.D.	Assoc. Professor	Pharma. Chemistry
32.	Dr. Durai Ananda Kumar (DAT)	M.Pharm., Ph.D.	Asst. Professor	Pharma. Chemistry
33.	Dr. H. Yogish Kumar (HYK)	M.Pharm., Ph.D.	Lecturer	Pharma. Chemistry
34.	Dr. Sheshagiri Dixit (SRD)	M.Pharm., Ph.D.	Lecturer	Pharma. Chemistry
35.	Mr. Chetan.I.A (CIA)	M.Pharm	Lecturer	Pharma. Chemistry

36.	Dr. K Mruthunjaya (KM)	M.Pharm., Ph.D.	Professor & Head	Pharmacognosy
37.	Dr. J. Suresh (JS)	M.Pharm., Ph.D.	Professor	Pharmacognosy
38.	Dr. N Paramakrishnan (NPK)	M.Pharm., Ph.D.	Asst. Professor	Pharmacognosy
39.	Mr. Rajaguru A (RG)	M.Pharm.	Lecturer	Pharmaceutical Biotechnology
40.	Ms. Haripriya G (HG)	M Pharm	Lecturer	Pharmacognosy
41.	Dr. S. N. Manjula (SNM)	M.Pharm., Ph.D.	Professor & Head	Pharmacology
42.	Dr. Saravana Babu C (SB)	M.Pharm., Ph.D.	Professor	Pharmacology
43.	Dr. K L Krishna (KLK)	M.Pharm., Ph.D.	Assoc. Professor	Pharmacology
44.	Ms. A M Mahalakshmi (AMM)	M.Pharm.	Asst. Professor	Pharmacology
45.	Ms. Seema Mehdi (SM)	M.Pharm	Lecturer	Pharmacology
46.	Dr. Nagashree K S (KNS)	M.Pharm., Ph.D	Lecturer	Pharmacology
47.	Dr. Dithu Thekkekkara (DT)	M.Pharm., Ph.D	Lecturer	Pharmacology

## **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

## 1. Course Details

Course code	Name of the course	No. of hours	Tutorial	Credit points
Bp401T	Pharmaceutical Organic Chemistry –III (Theory)	3	1	4
Bp402T	Medicinal Chemistry – I (Theory)	3	1	4
Bp403T	Physical Pharmaceutics-II (Theory)	3	1	4
Bp404T	Pharmacology-I (Theory)	3	1	4
Bp405T	Pharmacognosy And Phytochemistry I (Theory)	3	1	4
Bp406P	Medicinal Chemistry – I (Practical)	4	-	2
Bp407P	Physical Pharmaceutics- II (Practical)	4	-	2
Bp408P	Pharmacology-I (Practical)	4	-	2
<b>Total</b>		<b>27</b>	<b>5</b>	<b>26</b>

## 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**

<b>THEORY</b>		
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
<b>Total</b>	<b>10</b>	<b>5</b>
<b>PRACTICALS</b>		
Attendance	2	
Based on Practical Records, Regular viva voce, etc.	3	
<b>Total</b>	<b>5</b>	

**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) (Answer all the questions)	=	10 x 1 = 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-III**

Course code	Name of the course	Internal Assessment				University Exam		Total Marks	Credit points
		Continuous Mode	Sessional Exams		Total	Marks	Duration		
			Marks	Duration					
BP401T	Pharmaceutical Organic Chemistry-III(Theory)	10	15	1 Hr	25	75	3 Hrs	100	4
BP402T	Medicinal Chemistry I – Theory	10	15	1 Hr	25	75	3 Hrs	100	4
BP403T	Physical Pharmaceutics II– Theory	10	15	1 Hr	25	75	3 Hrs	100	4
BP404T	Pharmacology I – Theory	10	15	1 Hr	25	75	3 Hrs	100	4
BP405T	Pharmacognosy and Phytochemistry I (Theory)	10	15	1 Hrs	15	75	3 Hrs	100	4
BP406P	Medicinal Chemistry– I (Practical)	5	10	4 Hrs	15	35	4 Hrs	50	2
BP407P	Physical Pharmaceutics - II (Practical)	5	10	4 Hrs	15	35	4 Hrs	50	2
BP408P	Pharmacology-I (Practical)	5	10	4 Hrs	15	35	4 Hrs	50	2
<b>Total</b>		<b>65</b>	<b>105</b>	<b>17 Hrs.</b>	<b>160</b>	<b>480</b>	<b>27 Hrs.</b>	<b>650</b>	<b>26</b>

\* The lateral entry students must undertake non-university Examination for Communication skills and computer applications in pharmacy subjects

#### **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 should be completed before the commencement of next 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 3. 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

#### **Question pattern for university theory examinations for 75 marks paper**

I. Multiple Choice Questions (MCQs)	=	20 x 1 = 20
(Answer all the questions)	=	2 x 10 = 20
I. Long Answers (2 out of 3)	=	7 x 5 = 35
II. Short Answers (7 out of 9)	=	
		-----
Total	=	75 marks
		-----

#### **Question pattern for university theory examinations for 50 marks paper**

I. Long Answers (2 out of 3)	=	2 x 10 = 20
II. Short Answers (6 out of 8)	=	6 x 5 = 30
		-----
Total	=	50 marks
		-----

### 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.

## BP401T. PHARMACEUTICAL ORGANIC CHEMISTRY –III (Theory)

Teacher/s: Dr. Rupshee Jain

45 Hours (3 Hrs/ week)

**Scope:** This subject imparts knowledge on stereo-chemical aspects of organic compounds and organic reactions, important named reactions, chemistry of important hetero cyclic compounds. It also emphasizes on medicinal and other uses of organic compounds.

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

1. understand the methods of preparation and properties of organic compounds
2. explain the stereo chemical aspects of organic compounds and stereo chemical reactions
3. know the medicinal uses and other applications of organic compounds

**Theory:**

1. Explain & understand the optical and stereoisomerism of the organic compounds
2. Preparation & reactions of heterocyclic organic compounds
3. Account for reactivity of few heterocyclic compounds
4. To understand few named reactions of synthetic importance.

### Course Content:

Note: To emphasize on definition, types, mechanisms, examples, uses/applications

### Lecturer wise program

Chapter No.	Title`	No. of hours
1.	<b>Stereo isomerism</b> Optical isomerism – Optical activity, enantiomerism, diastereoisomerism, meso compounds	2 hrs
2.	Elements of symmetry, chiral and achiral molecules	2 hrs
3.	DL system of nomenclature of optical isomers, sequence rules, RS system of nomenclature of optical isomers	4 hrs
4.	Reactions of chiral molecules Racemic modification and resolution of racemic mixture. Asymmetric synthesis: partial and absolute	2 hrs
5.	Geometrical isomerism	2 hrs

	Nomenclature of geometrical isomers (Cis Trans, EZ, Syn Anti systems) Methods of determination of configuration of geometrical isomers.	
6.	Conformational isomerism in Ethane, n-Butane and Cyclohexane.	3 hrs
7.	Stereo isomerism in biphenyl compounds (Atropisomerism) and conditions for optical activity. Stereospecific and stereoselective reactions	5 hrs
8.	Nomenclature and classification Synthesis, reactions and medicinal uses of following compounds/derivatives. Pyrrole, Furan, and Thiophene	5 hrs
9.	Relative aromaticity and reactivity of Pyrrole, Furan and Thiophene	5 hrs
10.	Synthesis, reactions and medicinal uses of following compounds/derivatives Pyrazole, Imidazole, Oxazole and Thiazole.	4 hrs
11.	Pyridine, Quinoline, Isoquinoline, Acridine and Indole. Basicity of pyridine. Synthesis and medicinal uses of Pyrimidine, Purine, azepines and their derivatives	4 hrs
12.	<b>Reactions of synthetic importance</b> Metal hydride reduction (NaBH <sub>4</sub> and LiAlH <sub>4</sub> ), Clemmensen reduction, Birch reduction, Wolff Kishner reduction.	3 hrs
13.	Oppenauer-oxidation and Dakin reaction. Beckmanns rearrangement and Schmidt rearrangement. Claisen-Schmidt condensation	4 hrs

### Theory Sessional examination syllabus

Sessional No.	Syllabus
	Chapters no.
I	1-7 & 12
II	8-11 & 13

### BP402T. MEDICINAL CHEMISTRY –I (Theory)

Teacher/s: Dr. T. Durai Ananda Kumar (DAK)

45 Hours (3 Hrs/ week)

**Scope:** This subject is designed to impart fundamental knowledge on the structure, chemistry and therapeutic value of drugs. The subject emphasizes on structure activity relationships of drugs, importance of physicochemical properties and metabolism of drugs. The syllabus also emphasizes on chemical synthesis of important drugs under each class.

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

1. understand the chemistry of drugs with respect to their pharmacological activity
2. understand the drug metabolic pathways, adverse effect and therapeutic value of



drugs

3. know the Structural Activity Relationship (SAR) of different class of drugs

4. write the chemical synthesis of some drugs

**Course Content:**

Study of the development of the following classes of drugs, Classification, mechanism of action, uses of drugs mentioned in the course, Structure activity relationship of selective class of drugs as specified in the course and synthesis of drugs superscripted (\*)

**Lecture wise Program**

Chapter No.	Title	No. of hrs
1	Introduction, History and development of medicinal chemistry <b><i>Drug physicochemical properties:</i></b> Ionization, Solubility, Partition Coefficient, Hydrogen bonding, Protein binding, Chelation, Bioisosterism, Optical and Geometrical isomerism.	07
2	<b><i>Drug metabolism:</i></b> Principles- Phase I and Phase II. Factors affecting drug metabolism including stereo chemical aspects.	03
3	<b><i>Adrenergic Neurotransmitters:</i></b> Biosynthesis and catabolism of catecholamine. Adrenergic receptors (Alpha & Beta) and their distribution	01
4	<b><i>Sympathomimetic agents:</i></b> Classification (Direct and indirect acting), mechanism of action, therapeutic uses Chemical synthesis of Phenylephrine*, Salbutamol* SAR of sympathomimetic agents	05
5	<b><i>Adrenergic antagonists:</i></b> Classification (alpha and beta adrenergic blockers), mechanism of action, therapeutic uses Chemical synthesis of Tolazoline *, Salbutamol * SAR of beta blockers	04
6	<b><i>Cholinergic Neurotransmitters:</i></b> Biosynthesis and catabolism of acetylcholine. Cholinergic receptors (Muscarinic & Nicotinic) and their distribution	01
7	<b><i>Parasympathomimetic agents:</i></b> Classification (Direct and indirect acting), mechanism of action, therapeutic uses Chemical synthesis of Carbachol*, Neostigmine* SAR of parasympathomimetic agents Cholinesterase reactivator: Pralidoxime chloride.	05
8	<b><i>Cholinergic Blocking agents:</i></b> Classification (natural and synthetic), mechanism of action, therapeutic uses Chemical synthesis of Ipratropium bromide*, Dicyclomine hydrochloride*, Procyclidine hydrochloride	04

	SAR of cholinolytic agents	
9	<b><i>Sedatives and Hypnotics:</i></b> Classification, mechanism of action, therapeutic uses Chemical synthesis of Diazepam*, Dicyclomine hydrochloride*, Barbitol* SAR of benzodiazepines and barbiturates	03
10	<b><i>Sedatives and Hypnotics:</i></b> Classification, mechanism of action, therapeutic uses Chemical synthesis of Chlorpromazine hydrochloride* SAR of phenothiazines	03
11	<b><i>Anticonvulsants:</i></b> Classification, mechanism of action, therapeutic uses Chemical synthesis of Phenytoin*, Ethosuximide*, Carbamazepine* SAR of Anticonvulsants	02
12	<b><i>General anesthetics:</i></b> Classification, mechanism of action, therapeutic uses Chemical synthesis of Halothane*, Methohexital sodium*, Ketamine hydrochloride*	02
13	<b><i>Narcotic and non-narcotic analgesics:</i></b> Classification, mechanism of action, therapeutic uses Chemical synthesis of Fentanyl citrate*, Methadone hydrochloride*, SAR of Morphine analogues <b><i>Narcotic antagonists</i></b>	03
14	<b><i>Anti-inflammatory agents:</i></b> Classification, mechanism of action, therapeutic uses Chemical synthesis of Mefenamic acid*, Ibuprofen*	02

### Theory Sessional examination Syllabus

Sessional No.	Syllabus
	Chapters no.
I	1 to 7
II	8 to 14

### Recommended Books (Latest Editions)

- 1) Wilson and Giswold's Organic medicinal and Pharmaceutical Chemistry.
- 2) Foye's Principles of Medicinal Chemistry.
- 3) Burger's Medicinal Chemistry, Vol I to IV.
- 4) Introduction to principles of drug design- Smith and Williams.
- 5) Remington's Pharmaceutical Sciences.
- 6) Martindale's extra pharmacopoeia.
- 7) The Organic Chemistry of Drug Synthesis by Lednicer, Vol. 1-5.
- 8) Indian Pharmacopoeia.

### BP406P. MEDICINAL CHEMISTRY –I (Practical)

Teacher/s: Dr. T. Durai Ananda Kumar (DAK)

60Hours(4 Hours/Week)

I	<b>Preparation of drugs/ intermediates</b> Preparation of 1,3-pyrazole Preparation of 1,3-oxazole Preparation of benzimidazole Preparation of benztriazole Preparation of 2,3- diphenyl quinoxaline Preparation of benzocaine Preparation of phenytoin Preparation of phenothiazine Preparation of barbiturate
II	<b>Assay of drugs</b> Estimation of chlorpromazine Estimation of phenobarbitone Estimation of atropine Estimation of chlorpromazine Estimation of ibuprofen

	Estimation of aspirin Estimation of furosemide
III	<b>Determination of Partition coefficient for any two drugs</b> Estimation of benzoic acid Estimation of salicylic acid

**Recommended Books (Latest Editions)**

- 1) Remington's Pharmaceutical Sciences.
- 2) Martindale's extra pharmacopoeia.
- 3) Organic Chemistry by I.L. Finar, Vol. II.
- 4) Indian Pharmacopoeia.
- 5) Text book of practical organic chemistry- A.I.Vogel.

## BP 403 T. PHYSICAL PHARMACEUTICS-II (Theory)

Teacher/s: Mrs. Preethi.S (PS)

45 Hours (3 Hrs/ week)

**Scope:** The course deals with the various physical and physicochemical properties, and principles involved in dosage forms/formulations. Theory and practical components of the subject help the student to get a better insight into various areas of formulation research and development, and stability studies of pharmaceutical dosage forms.

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

1. Understand various physicochemical properties of drug molecules in the designing the dosage forms
2. Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
3. Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.

**Course Content:**

### Lecture wise Program

Chapter No.	Title	No. of Hours
1	Colloidal dispersions: Classification of dispersed systems & their general characteristics, size & shapes of colloidal particles, classification of colloids & comparative account of their general properties.	4
2	Optical, kinetic & electrical properties. Effect of electrolytes, coacervation, peptization & protective action.	3
3	Rheology: Newtonian systems, law of flow, kinematic viscosity, effect of temperature, non-Newtonian systems, pseudoplastic, dilatant, plastic, thixotropy, thixotropy in formulation, determination of viscosity, capillary, falling Sphere, rotational viscometers	5
4	Deformation of solids: Plastic and elastic deformation, Heckel equation, Stress, Strain, Elastic Modulus	5
5	Coarse dispersion: Suspension, interfacial properties of suspended particles, settling in suspensions, formulation of flocculated and deflocculated suspensions.	5

<b>6</b>	Emulsions and theories of emulsification, microemulsion and multiple emulsions; Stability of emulsions, preservation of emulsions, rheological properties of emulsions and emulsion formulation by HLB method.	<b>5</b>
<b>7</b>	Micromeritics: Particle size and distribution, mean particle size, number and weight distribution, particle number, methods for determining particle size by different methods, counting and separation method, particle shape, specific surface.	<b>5</b>
<b>8</b>	Methods for determining surface area, permeability, adsorption, derived properties of powders, porosity, packing arrangement, densities, bulkiness & flow properties.	<b>5</b>
<b>9</b>	Drug stability: Reaction kinetics: zero, pseudo-zero, first & second order, units of basic rate constants, determination of reaction order. Physical and chemical factors influencing the chemical degradation of pharmaceutical product: temperature, solvent, ionic strength, dielectric constant, specific & general acid base catalysis, Simple numerical problems.	<b>5</b>
<b>10</b>	Stabilization of medicinal agents against common reactions like hydrolysis & oxidation. Accelerated stability testing in expiration dating of pharmaceutical dosage forms. Photolytic degradation and its prevention.	<b>5</b>

**Theory Sessional examination Syllabus**

Sessional No.	Syllabus
	Chapters no.
I	1 to 5
II	6 to 10

**BP 407P. PHYSICAL PHARMACEUTICS- II (Practical)**

**Teacher/s: Mrs. Preethi.S (PS)**

**60 Hours (4 Hrs/ week)**

1. Determination of particle size, particle size distribution using sieving method
2. Determination of particle size, particle size distribution using Microscopic method
3. Determination of bulk density, true density and porosity
4. Determine the angle of repose and influence of lubricant on angle of repose
5. Determination of viscosity of liquid using Ostwald's viscometer
6. Determination sedimentation volume with effect of different suspending agent
7. Determination sedimentation volume with effect of different concentration of single suspending agent
8. Determination of viscosity of semisolid by using Brookfield viscometer
9. Determination of reaction rate constant first order.
10. Determination of reaction rate constant second order
11. Accelerated stability studies

**Recommended Books: (Latest Editions)**

1. Physical Pharmacy by Alfred Martin, Sixth edition
2. Experimental pharmaceutics by Eugene, Parott.
3. Tutorial pharmacy by Cooper and Gunn.
4. Stocklosam J. Pharmaceutical calculations, Lea & Febiger, Philadelphia.
5. Liberman H.A, Lachman C., Pharmaceutical Dosage forms, Tablets, Volume-1 to 3, Marcel Dekkar Inc.
6. Liberman H.A, Lachman C, Pharmaceutical dosage forms. Disperse systems, volume 1, 2, 3. Marcel Dekkar Inc.
7. Physical Pharmaceutics by Ramasamy C, and Manavalan R.

**BP 404 T. PHARMACOLOGY-I (Theory)**

**Teacher/s: Dr. Dithu Thekkekkara**

**45 Hours (3 Hrs/ week)**

**Scope:** The main purpose of the subject is to understand what drugs do to the living organisms and how their effects can be applied to therapeutics. The subject covers the information about the drugs like, mechanism of action, physiological and biochemical effects (pharmacodynamics) as well as absorption, distribution, metabolism and excretion (pharmacokinetics) along with the

adverse effects, clinical uses, interactions, doses, contraindications and routes of administration of different classes of drugs.

**Objectives:** Upon completion of this course the student should be able to

1. Understand the pharmacological actions of different categories of drugs
2. Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.
3. Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
4. Observe the effect of drugs on animals by simulated experiments
5. Appreciate correlation of pharmacology with other bio medical sciences

**Course Content:**

**Lecture wise Program**

<b>Chapter No.</b>	<b>Title</b>	<b>No. of Hours</b>
<b>1</b>	<b>a.</b> Introduction to Pharmacology- Definition, historical landmarks and scope of pharmacology, nature and source of drugs, essential drugs concept and routes of drug administration, Agonists, antagonists( competitive and non competitive), spare receptors, addiction, tolerance, dependence, tachyphylaxis, idiosyncrasy, allergy.	<b>4</b>
<b>2</b>	<b>b.</b> Pharmacokinetics- Membrane transport, absorption, distribution, metabolism and excretion of drugs .Enzyme induction, enzyme inhibition, kinetics of elimination.	<b>4</b>
<b>3</b>	<b>a.</b> Pharmacodynamics- Principles and mechanisms of drug action. Receptor theories and classification of receptors, regulation of receptors. drug receptors interactions signal transduction mechanisms, G-protein–coupled receptors, ion channel receptor, transmembrane enzyme linked receptors.	<b>4</b>
<b>4</b>	Transmembrane JAK-STAT binding receptor and receptors that regulate transcription factors, dose response relationship, therapeutic index, combined effects of drugs and factors modifying drug action. <b>b.</b> Adverse drug reactions.	<b>4</b>



<b>5</b>	c. Drug interactions (pharmacokinetic and pharmacodynamic) d. Drug discovery and clinical evaluation of new drugs -Drug discovery phase, preclinical evaluation phase, clinical trial phase, phases of clinical trials and pharmacovigilance.	<b>4</b>
<b>6</b>	<b>Pharmacology of drugs acting on peripheral nervous system</b> a. Organization and function of ANS. b. Neurohumoral transmission, co-transmission and classification of neurotransmitters. c. Parasympathomimetics, Parasympatholytics, Sympathomimetics, sympatholytics.	<b>5</b>
<b>7</b>	d. Neuromuscular blocking agents and skeletal muscle relaxants (peripheral). e. Local anesthetic agents. f. Drugs used in myasthenia gravis and glaucoma.	<b>5</b>
<b>8</b>	<b>Pharmacology of drugs acting on central nervous system</b> a. Neurohumoral transmission in the C.N.S. special emphasis on importance of various neurotransmitters like with GABA, Glutamate, Glycine, serotonin, dopamine. b. General anesthetics and pre-anesthetics.	<b>4</b>
<b>9</b>	c. Sedatives, hypnotics and centrally acting muscle relaxants. d. Anti-epileptics. e. Alcohols and disulfiram.	<b>4</b>
<b>10</b>	<b>Pharmacology of drugs acting on central nervous system</b> a. Psychopharmacological agents: Antipsychotics, antidepressants, anti-anxiety agents, anti-manics and hallucinogens. b. Drugs used in Parkinsons disease and Alzheimer's disease.	<b>4</b>
<b>11</b>	c. CNS stimulants and nootropics. d. Opioid analgesics and antagonists e. Drug addiction, drug abuse, tolerance and dependence.	<b>3</b>

### Theory Sessional examination syllabus

Sessional No.	Syllabus
	Chapters no.
I	1 to 5
II	6 to 11

## **BP 408 P.PHARMACOLOGY-I (Practical)**

**Teacher/s: Dr. Dithu Thekkekkara**

**60 Hours(4 Hrs/ week)**

1. Introduction to experimental pharmacology.
2. Commonly used instruments in experimental pharmacology.
3. Study of common laboratory animals.
4. Maintenance of laboratory animals as per CPCSEA guidelines.
5. Common laboratory techniques. Blood withdrawal, serum and plasma separation, anesthetics and euthanasia used for animal studies.
6. Study of different routes of drugs administration in mice/rats.
7. Study of effect of hepatic microsomal enzyme inducers on the phenobarbitone sleeping time in mice.
8. Effect of drugs on ciliary motility of frog oesophagus
9. Effect of drugs on rabbit eye.
10. Effects of skeletal muscle relaxants using rota-rod apparatus.
11. Effect of drugs on locomotor activity using actophotometer.
12. Anticonvulsant effect of drugs byMES and PTZ method.
13. Study of stereotype and anti-catatonic activity of drugs on rats/mice.
14. Study of anxiolytic activity of drugs using rats/mice.
15. Study of local anesthetics by different methods

*Note: All laboratory techniques and animal experiments are demonstrated by simulated experiments by softwares and videos*

### **Recommended Books (Latest Editions)**

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology,.Churchil Livingstone Elsevier
2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill
3. Goodman and Gilman's, The Pharmacological Basis of Therapeutics

4. Marry Anne K. K., Lloyd Yee Y., Brian K. A., Robbin L.C., Joseph G. B., Wayne A. K., Bradley R.W., Applied Therapeutics, The Clinical use of Drugs, The Point Lippincott Williams &Wilkins
5. Mycek M.J, Gelnet S.B and Perper M.M. Lippincott's Illustrated Reviews- Pharmacology
6. K.D.Tripathi. Essentials of Medical Pharmacology, JAYPEE Brothers Medical Publishers (P) Ltd, New Delhi.
7. Sharma H. L., Sharma K. K., Principles of Pharmacology, Paras medical publisher
8. Modern Pharmacology with clinical Applications, by Charles R.Craig& Robert,
9. Ghosh MN. Fundamentals of Experimental Pharmacology. Hilton & Company, Kolkata.
10. Kulkarni SK. Handbook of experimental pharmacology. Vallabh Prakashan,

## BP 405 T.PHARMACOGNOSY AND PHYTOCHEMISTRY I (Theory)

Teacher/s: Dr. N Paramakrishnan

45 Hours (4 Hrs/ week)

**Scope:** The subject involves the fundamentals of Pharmacognosy like scope, classification of crude drugs, their identification and evaluation, phytochemicals present in them and their medicinal properties.

**Objectives:** Upon completion of the course, the student shall be able

1. to know the techniques in the cultivation and production of crude drugs
2. to know the crude drugs, their uses and chemical nature
3. know the evaluation techniques for the herbal drugs
4. to carry out the microscopic and morphological evaluation of crude drugs

**Course Content:**

### Lecture wise Program

Chapter No.	Title	No. of Hours
1	<b>Introduction to Pharmacognosy:</b> (a) Definition, history, scope and development of pharmacognosy (b) Sources of Drugs – Plants, Animals, Marine & Tissue culture (c) Organized drugs, unorganized drugs (dried latex, dried juices, dried extracts, gums and mucilages, oleoresins and oleo- gum -resins). <b>Classification of drugs:</b> Alphabetical, morphological, taxonomical, chemical, pharmacological, chemo and sero taxonomical classification of drugs.	5
2	<b>Quality control of Drugs of Natural Origin:</b> Adulteration of drugs of natural origin. Evaluation by organoleptic, microscopic, physical, chemical and biological methods and properties. Quantitative microscopy of crude drugs including lycopodium spore method, leaf constants, camera lucida and diagrams of microscopic objects to scale with camera lucida.	5
3	<b>Cultivation, Collection, Processing and storage of drugs of natural origin:</b> Cultivation and Collection of drugs of natural origin. Factors	5

	influencing cultivation of medicinal plants. Plant hormones and their applications.	
<b>4</b>	Polyploidy, mutation and hybridization with reference to medicinal plants. <b>Conservation of medicinal plants.</b>	<b>5</b>
<b>5</b>	<b>Plant tissue culture:</b> Historical development of plant tissue culture, types of cultures, Nutritional requirements, growth and their maintenance.	<b>4</b>
<b>6</b>	Applications of plant tissue culture in pharmacognosy. Edible vaccines.	<b>3</b>
<b>7</b>	<b>Pharmacognosy in various systems of medicine:</b> Role of Pharmacognosy in allopathy and traditional systems of medicine namely, Ayurveda, Unani, Siddha, Homeopathy and Chinese systems of medicine.	<b>5</b>
<b>8</b>	<b>Introduction to secondary metabolites:</b> Definition, classification, properties and test for identification of Alkaloids, Glycosides, Flavonoids, Tannins, Volatile oil and Resins.	<b>5</b>
<b>9</b>	Study of biological source, chemical nature and uses of drugs of natural origin containing following drugs. <b>Plant Products:</b> Fibers - Cotton, Jute, Hemp, Hallucinogens, Teratogens, Natural allergens. <b>Primary metabolites:</b> General introduction, detailed study with respect to chemistry, sources, preparation, evaluation, preservation, storage, therapeutic used and commercial utility as Pharmaceutical Aids and/or Medicines for the following Primary metabolites:	<b>4</b>
<b>10</b>	<b>Carbohydrates:</b> Acacia, Agar, Tragacanth, Honey. <b>Proteins and Enzymes :</b> Gelatin, casein, proteolytic enzymes (Papain, bromelain, serratiopeptidase, urokinase, streptokinase, pepsin). <b>Lipids (Waxes, fats, fixed oils) :</b> Castor oil, Chaulmoogra oil, Wool Fat, Bees Wax. <b>Marine Drugs:</b> Novel medicinal agents from marine sources.	<b>4</b>

### Theory Sessional examination Syllabus

Sessional No.	Syllabus
	Chapters no.
I	1 to 5
II	6 to 10

## **BP408 P. PHARMACOGNOSY AND PHYTOCHEMISTRY I (Practical)**

**Teacher/s: Dr. N Paramakrishnan**

**60 Hours (4 Hrs/ week)**

1. Analysis of crude drugs by chemical tests: (i)Tragacanth (ii) Acacia (iii)Agar (iv) Gelatin (v) starch (vi) Honey (vii) Castor oil
2. Determination of stomatal number and index
3. Determination of vein islet number, vein islet termination and palisade ratio. 4. Determination of size of starch grains, calcium oxalate crystals by eye piece micrometer
5. Determination of Fiber length and width
6. Determination of number of starch grains by Lycopodium spore method
7. Determination of Ash value
8. Determination of Extractive values of crude drugs
9. Determination of moisture content of crude drugs
10. Determination of swelling index and foaming

### **Recommended Books: (Latest Editions)**

1. W.C.Evans, Trease and Evans Pharmacognosy, 16th edition, W.B. Saunders & Co., London, 2009.
2. Tyler, V.E., Brady, L.R. and Robbers, J.E., Pharmacognosy, 9th Edn., Lea and Febiger, Philadelphia, 1988.
3. Text Book of Pharmacognosy by T.E. Wallis
4. Mohammad Ali. Pharmacognosy and Phytochemistry, CBS Publishers & Distribution, New Delhi.
5. Text book of Pharmacognosy by C.K. Kokate, Purohit, Gokhlae (2007), 37th Edition, Nirali Prakashan, New Delhi.
6. Herbal drug industry by R.D. Choudhary (1996), Ist Edn, Eastern Publisher, New Delhi.
7. Essentials of Pharmacognosy, Dr.SH.Ansari, IInd edition, Birla publications, New Delhi, 2007
8. Practical Pharmacognosy: C.K. Kokate, Purohit, Gokhlae
9. Anatomy of Crude Drugs by M.A. Iyengar

**JSS Academy of Higher Education & Research**  
**JSS College of Pharmacy**

Sri Shivarathreeshwara Nagara, Mysore-570015

CLASS TIME TABLE – 2021-22

Class: B. PHARM (Semester- IV)

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	5.00-5.55PM
Monday	PCOLOGY DITHU	←-P. Cog & Phy ←Med.Che-I----	-----Batch - IV--NPK-----→ -----Batch - I --Bhagya-----→		POC-III(LH4) RJ	PPC-II PS	POC-III(Tu) RJ	-----
Tuesday	MC-I DAK LH4	← Med.Che-I----- ←--PPC-II----- ←-P. Col-I----	-----Batch - II --KDA-----→ -----Batch - III ----PS-----→ -----Batch - I--DITHU-----→		PPC-II PS	P.COG&PPHY TO NPK	MC-I DAK	-----
Wednesday	MC-I DAK	← Med.Chemis-I ←--PPC-II-- ←-P. Cog & Phy ←--Pharmacol-I--	-----Batch - III--KDA-----→ -----Batch - IV ----PS-----→ -----Batch - I--NPK-----→ -----Batch - II--DITHU-----→		POC-III RJ - LH4	P.COG&PPHYTO (TU) NPK	P.COG&PPHYTO NPK	-----
Thursday	← - Med.Chemistry-I----- ←--Phy. Pharmaceutics-II----- ←--P. Cog and Phyto----- ←--Pharmacology-I-----		-----Batch - IV--KDA-----→ -----Batch - I ----PS-----→ -----Batch - II--HP-----→ -----Batch - III--VIC-----→		P.COG&PPHYTO NPK	POC-III RJ	MC-I(Tu) DAK	-----
Friday	←--Phy. Pharmaceutics-II----- ←--Pharmacology-I----- ←--P. Cog and Phyto-----		-----Batch - II ----PS-----→ -----Batch - IV--TOUSIF--→ -----Batch - III --NPK-----→		PCOLOGY DITHU	PPC-II PS	PCOLOGY DITHU	-----
Saturday	PPC-II(Tu) PS	PCOLOGY(TU) DITTU						

\*Effective from: March 21<sup>st</sup> - 2022

Note: 1. No tea break for practical's

Time table Coordinator

Copy: SNB/LNB/SCF/e-copy-Teachers/ Office incharge-Time table / Time table Coordinator

Principal

OPCS.1SOP(2)F(1)