P. RAMI REDDY MEMORIAL COLLEGE OF PHARMACY
(AUTONOMOUS)
44/35-1, Prakruthi Nagar, Utukur, Kadapa – 516 003 A.P.
(Approved by AICTE & PCI, New Delhi and Affiliated to JNTUA, Ananthapuramu)
Recognized u/s 2(f) & 12(b) of the UGC Act, 1956, New Delhi. Accredited by NAAC.

PRRMCP R25 REGULATIONS

Academic Regulations Course Structure and Detailed Syllabi

Pharm.D

and

Pharm.D (*Postbaccalaureate*)

Pharm.D (Regular six year course)

and

Pharm.D (*Post baccalaureate*)
(Regular three year course)
(Applicable for the batches admitted from Academic Year 2025-26)

As per PCI and JNTUA Norms

Doctor of Pharmacy (Pharm.D) Syllabus

Academic Regulations 2025 for Pharm.D and Pharm.D (Post Baccalaureate) (Regular)
(Effective for the students admitted into I year from the Academic Year 2025-2026 onwards)

1. Award of Pharm.D Degree

A student will be declared eligible for the award of the Pharm. D. Degree if he/she fulfils the following academic regulations:

i. Duration of the course. –

a) Pharm.D: The duration of the course shall be six academic years (five years of study and one year of internship or residency) full time with each academic year spread over a period of not less than two hundred working days. The period of six years duration is divided into two phases –

Phase I – consisting of First, Second, Third, Fourth and Fifth academic year.

Phase II – consisting of internship or residency training during sixth year involving posting in speciality units. It is a phase of training wherein a student is exposed to actual pharmacy practice or clinical pharmacy services and acquires skill under supervision so that he or she may become capable of functioning independently.

b) Pursue the course of study for not less than SIX academic years and is not more than TWELVE years.

c)Students, who fail to fulfil all the academic requirements for the award of the degree within TWELVE academic years from the year of their admission, shall forfeit their seat in Pharm D. course and their admission is cancelled.

2. Award of the Pharm. D (Post Baccalaureate) Degree.

A student will be declared eligible for the award of the Pharm. D (Post Baccalaureate). Degree if he fulfils the following academic regulations:

a) Pharm.D. (Post Baccalaureate): The duration of the course shall be for three academic years (two years of study and one year internship or residency) full time with each academic year spread over a period of not less than two hundred working days. The period of three years duration is divided into two phases –

Phase I – consisting of First and Second academic year.

Phase II – consisting of Internship or residency training during third year involving posting in speciality units. It is a phase of training wherein a student is exposed to actual pharmacy practice or clinical pharmacy services, and acquires skill under supervision so that he or she may become capable of functioning independently.

b) Pursue the course of study for not less than THREE academic years and is not more than SIX years.

c) Students, who fail to fulfil all the academic requirements for the award of the degree within SIX academic years from the year of their admission, shall forfeit their seat in Pharm D (PB) course and their admission is cancelled.

d) To add prefix 'Dr.' before the name of the candidate while awarding the degree 'Doctor of Pharmacy' vide regulation 18 of the Pharm D regulation, 2008.

3. Minimum qualification for admission to. –

a) Pharm.D. Part-I Course – A pass in any of the following examinations –

(1) 10+2 examination with Physics and Chemistry as compulsory subjects along with one of the following subjects: Mathematics or Biology.

(2) A pass in D.Pharmacy course from an institution approved by the Pharmacy Council of India under section 12 of the Pharmacy Act.

(3) Any other qualification approved by the Pharmacy Council of India as equivalent to any of the above examinations. Provided that a student should complete the age of 17 years on or before 31st December of the year of admission to the course. Provided that there shall be reservation of seats for the students belonging to the Scheduled Castes, Scheduled Tribes and other Backward Classes in accordance with the instructions issued by the Central Government/State Government/Union Territory Administration as the case may be from time to time.

b) Pharm.D. (Post Baccalaureate) Course - A pass in B.Pharm from an institution approved by the Pharmacy Council of India under section 12 of the Pharmacy Act: Provided that there shall be reservation of seats for the students belonging to the Scheduled Castes, Scheduled Tribes and other Backward Classes in accordance with the instructions issued by the Central Government/State Government/Union Territory Administration as the case may be from time to time.

4. Course of study. –

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

In Second year Pharm.D for the student benefit and future prospective included Communicative English and Computer Technology (Audit Course). Communication and computer skills are important for Case presentations, Journal club, Clerkship and Project works etc.

In fifth year Pharm.D included audit course is Medical and Scientific Writing helps to promote the principles of scientific writing and research work.

COURSE STRUCTURE

First Year:

S. No.	Subjects Codes	Name of Subject	No. of hours of Theory	No. of hours of Tutorial	No. of hours of Practical	Lab	S. No.	Subjects codes
(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)
1.1	25T00101	Human Anatomy and Physiology	3	1	3	✓	1.7	25T00107
1.2	25T00102	Pharmaceutics	2	1	3	✓	1.8	25T00108
1.3	25T00103	Medicinal Biochemistry	3	1	3	✓	1.9	25T00109
1.4	25T00104	Pharmaceutical Organic Chemistry	3	1	3	✓	2.0	25T00110
1.5	25T00105	Pharmaceutical Inorganic Chemistry	2	1	3	✓	2.1	25T00111
1.6	25T00106	Remedial Mathematics/ Biology **	3/3*	1	0/3*	✓*	2.2	25T00112*
		Total hours	**16**	**6**	**15/18***			
		Total hours/Week	**37/40***					

* For Biology

** For Candidates who have studied PCMB in 10+2 course are exempted.

Second Year:

S. No.	Subjects Codes	Name of Subject	No. of hours of Theory	No. of hours of Tutorial	No. of hours of Practical	Lab	S. No.	Subjects Codes
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**		**(7)**	**(8)**
2.1	25T00201	Pathophysiology	3	1	-	-		-
2.2	25T00202	Pharmaceutical Microbiology	3	1	3	✓	2.8	25T00207
2.3	25T00203	Pharmacognosy & Phytopharmaceuticals	3	1	3	✓	2.9	25T00208
2.4	25T00204	Pharmacology - I	3	1	-	-		-
2.5	25T00205	Community Pharmacy	2	1	-	-		-
2.6	25T00206	Pharmacotherapeutics-I	3	1	3	✓	2.10	25T00209
2.7	25T00210	Communicative English and Computer Technology (Audit Course)	2					
		Total Hours	**19**	**6**	**9**			
		Total hours/Week	**34**					

For Audit course there is no internal and external examination.

Third Year:

S. No.	Subjects Codes	Name of Subject	No. of hours of Theory	No. of hours of Tutorial	No. of hours of Practical	Lab	S. No.	Subjects Codes
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**		**(7)**	**(8)**
3.1	25T00301	Pharmacology-II	3	1	3	✓	3.7	25T00307
3.2	25T00302	Pharmaceutical Analysis	3	1	3	✓	3.8	25T00308
3.3	25T00303	Pharmacotherapeutics-II	3	1	3	✓	3.9	25T00309
3.4	25T00304	Pharmaceutical Jurisprudence	2	-	-	-		-
3.5	25T00305	Medicinal Chemistry	3	1	3	✓	4.0	25T00310
3.6	25T00306	Pharmaceutical Formulations	2	1	3	✓	4.1	25T00311
		Total hours	**16**	**5**	**15**			
		Total hours/Week	**36**					

Fourth Year:

S. No.	Subjects Codes	Name of Subject	No. of hours of Theory	No. of hours of Tutorial	No. of hours of Practical/ Hospital Posting	Lab	S. No.	Subjects Codes
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**		**(7)**	**(8)**
4.1	25T00401	Pharmacotherapeutics-III	3	1	3	✓	4.7	25T00407
4.2	25T00402	Hospital Pharmacy	2	1	3	✓	4.8	25T00408
4.3	25T00403	Clinical Pharmacy	3	1	3	✓	4.9	25T00409
4.4	25T00404	Biostatistics & Research Methodology	2	1	-	-		-
4.5	25T00405	Biopharmaceutics & Pharmacokinetics	3	1	3	✓	4.10	25T00410
4.6	25T00406	Clinical Toxicology	2	1	-	-		-
		Total hours	**15**	**6**	**12**			
		Total hours/Week	**33**					
For Pharm.D (Post Baccalaureate)								
4.11	25T00411	Pharmacotherapeutics I & II	3	1	3	✓	4.12	25T00412
		Total hours	**18**	**7**	**15**			
		Total hours/Week	**40**					

Fifth Year:

S. No.	Subjects Codes	Name of Subject	No. of hours of Theory	No. of hours of Seminar	No. of hours of Hospital posting*
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
5.1	25T00501	Clinical Research	3	1	-
5.2	25T00502	Pharmacoepidemiology and Pharmacoeconomics	3	1	-
5.3	25T00503	Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring	2	1	-
5.4	25T00504	Clerkship*	-	1	-
5.5	25T00505	Project work (Six Months)	-	-	20
5.6	25T00506	Medical and Scientific Writing (Audit Course)	2		
		Total hours	**8**	**4 = 32**	**20**

* Attending ward rounds on daily basis.

Note: The entire class work be spread for the entire Academic Year along with Project work and clerkship.

For Audit course there is no internal and external examination.

Note: A candidate is permitted to submit Project work on acquiring the credentials, by producing Online Certificate course (SWAYAM/NPTEL) or publishing their Research / Review work indexed in Scopus / Web of Science/ UGC Care list Journals.

Sixth Year:

Internship or residency training including postings in speciality units. Student should independently provide the clinical pharmacy services to the allotted wards.

(i) Six months in General Medicine department, and

(ii) Two months each in three other specialty departments

5. Syllabus. – The syllabus for each subject of study in the said Tables shall be as specified in **Appendix -A** to these regulations.

6. Examination. –

(1) Every year there shall be an examination to examine the students.

(2) Each examination may be held twice every year. The first examination in a year shall be the annual examination and the second examination shall be supplementary examination. Supplementary examination (advanced) may be conducted within three months after announcement of the regular examination results.

(3) The examinations shall be of written and practical (including oral nature) carrying maximum marks for each part of a subject as indicated in Table below:

T A B L E S

First Year examination:

S. No.	Name of Subject	Maximum marks for Theory			Maximum marks for Practicals		
		Examination	Sessional	Total	Examination	Sessional	Total
1.1	Human Anatomy and Physiology	70	30	100	70	30	100
1.2	Pharmaceutics	70	30	100	70	30	100
1.3	Medicinal Biochemistry	70	30	100	70	30	100
1.4	Pharmaceutical Organic Chemistry	70	30	100	70	30	100
1.5	Pharmaceutical Inorganic Chemistry	70	30	100	70	30	100
1.6	Remedial Mathematics/ Biology	70	30	100	70	30	100
				600			600 = **1200**

Second Year examination:

S. No	Name of Subject	Maximum marks for Theory			Maximum marks for Practicals		
		Examination	Sessional	Total	Examination	Sessional	Total
2.1	Pathophysiology	70	30		-	-	-
2.2	Pharmaceutical Microbiology	70	30	100	70	30	100
2.3	Pharmacognosy &Phytopharmaceuticals	70	30	100	70	30	100
2.4	Pharmacology - I	70	30	100	-	-	-
2.5	Community Pharmacy	70	30	100	-	-	-
2.6	Pharmacotherapeutics - I	70	30	100	70	30	100
2.7	Communicative English and Computer Technology (Audit Course)	-	-	-	-	-	-
				600			300 = **900**

For Audit course there is no internal and external examination.

Third Year examination:

S. No.	Name of Subject	Maximum marks for Theory			Maximum marks for Practicals		
		Examination	Sessional	Total	Examination	Sessional	Total
3.1	Pharmacology-II	70	30	100	70	30	100
3.2	Pharmaceutical Analysis	70	30	100	70	30	100
3.3	Pharmacotherapeutics-II	70	30	100	70	30	100
3.4	Pharmaceutical Jurisprudence	70	30	100	-	-	-
3.5	Medicinal Chemistry	70	30	100	70	30	100
3.6	Pharmaceutical Formulations	70	30	100	70	30	100
				600			500 = **1100**

Fourth Year examination:

S. No.	Name of Subject	Maximum marks for Theory			Maximum marks for Practicals		
		Examination	Sessional	Total	Examination	Sessional	Total
4.1	Pharmacotherapeutics-III	70	30	100	70	30	100
4.2	Hospital Pharmacy	70	30	100	70	30	100
4.3	Clinical Pharmacy	70	30	100	70	30	100
4.4	Biostatistics & Research Methodology	70	30	100	-	-	-
4.5	Biopharmaceutics & Pharmacokinetics	70	30	100	70	30	100
4.6	Clinical Toxicology	70	30	100	-	-	-
				600			500 = **1100**

Fifth Year examination:

S. No.	Name of Subject	Maximum marks for Theory			Maximum marks for Practicals		
		Examination	Sessional	Total	Examination	Sessional	Total
5.1	Clinical Research	70	30	100	-	-	-
5.2	Pharmacoepidemiology and Pharmacoeconomics	70	30	100	-	-	-
5.3	Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring	70	30	100	-	-	-
5.4	Clerkship*	-	-	-	70	30	100
5.5	Project work (Six Months)	-	-	-	100**	-	100
5.6	Medical and Scientific Writing (Audit Course)	-	-	-	-	-	-
				300			200 = **500**

**Attending ward rounds on daily basis.*
*** 30 marks – viva-voce (oral) & 70 marks – Thesis work*
For Audit course there is no internal and external examination.

7. Attendance requirements:

A student shall be eligible to appear for End examinations if he acquires a minimum of 80% of attendance in aggregate of all the subjects in a year.

7.1 Condonation of shortage of attendance in aggregate from 70% and above and below 80% in each year may be granted by the College Academic Committee, on medical grounds/valid reasons.

7.2 Shortage of Attendance below 70% in aggregate shall in NO case be condoned.

7.3 Students whose shortage of attendance is not condoned in any year are not eligible to take their end examination of that class and their registration shall stand cancelled.

7.4 A student will not be promoted to the next year unless he/she satisfies the attendance requirements of the present year, as applicable. They may seek readmission for that year when offered next.

7.5 A stipulated fee shall be payable towards condonation of shortage of attendance to the University.

8. Mode of examinations

(1) Theory examination shall be of three hours and practical examination shall be of four hours duration.

(2) A Student who fails in theory or practical examination of a subject shall re-appear both in theory and practical of the same subject.

(3) Practical examination shall also consist of a viva –voce (Oral) examination.

(4) Clerkship examination – Oral examination shall be conducted after the completion of clerkship of students. An external and an internal examiner will evaluate the student. Students may be asked to present the allotted medical cases followed by discussion. Students' capabilities in delivering clinical pharmacy services, pharmaceutical care planning and knowledge of therapeutics shall be assessed.

9. Award of sessional marks and maintenance of records. —

(1) A regular record of both theory and practical class work and examinations conducted in an institution imparting training for Pharm.D. or as the case may be, Pharm.D (Post Baccalaureate) course, shall be maintained for each student in the institution and 30 marks for each theory and 30 marks for each practical subject shall be allotted as sessional.

(2) There shall be at least three periodic sessional examinations during each academic year and the highest aggregate of any two performances shall form the basis of calculating sessional marks.

(3) The sessional marks in practicals shall be allotted on the following basis: -

(i) Actual performance in the sessional examination (20 marks);

(ii) Day to day assessment in the practical class work, promptness, viva-voce record maintenance, etc. (10 marks).

10. Minimum marks for passing examination:

A student shall not be declared to have passed examination unless he or she secures at least 50% marks in each of the subjects separately in the theory examinations, including sessional marks and at least 50% marks in each of the practical examinations including sessional marks. The students securing 60% marks or above in aggregate in all subjects at the Pharm. D or as the case may be, Pharm. D (Post Baccalaureate) course examination shall be declared to have passed in first class. Students securing 75% marks or above in aggregate in all subjects shall be declared to have passed with distinction provided the student completes the course in 6 years for Pharm. D and 3 Years for Pharm. D (Post baccalaureate). Pass class shall be awarded to such of the candidates who would have passed the examination in subsequent number of attempts after completion of 6/3 years of the course.

11. Eligibility for promotion to next year. -

All students who have appeared for all the subjects and passed the first year annual examination are eligible for promotion to the second year and, so on. However, failure in more than three subjects (excluding Remedial Mathematics/ Biology) including supplementary examinations shall debar him or her from promotion to the next year classes.

Note: At any time of the course study a student should not have failed in more than 3 subjects (excluding Remedial Mathematics/ Biology) to be eligible for promotion to next higher class.

12. Internship. —

(1) Internship is a phase of training wherein a student is expected to conduct actual practice of pharmacy and health care and acquires skills under the supervision so that he or she may become capable of functioning independently.

(2) Every student has to undergo one year internship as per PCI norms for Pharm D (Appendix B).

13. Certificate of passing examination. — Every student who has passed the examinations for the Pharm.D. (Doctor of Pharmacy) or Pharm.D. (Post Baccalaureate) (Doctor of Pharmacy) as the case may be, shall be granted a certificate by the examining authority.

14. Hospital posting. — Every student shall be posted in constituent hospital for a period of not less than fifty hours to be covered in not less than 200 working days in each of second, third & fourth year course. Each student shall submit report duly certified by the preceptor and duly attested by the Head of the Department or Institution as prescribed. In the fifth year, every student shall spend half a day in the morning hours attending ward rounds on daily basis as a part of clerkship. Theory teaching may be scheduled in the afternoon.

15. Project work. —

(1) To allow the student to develop data collection and reporting skills in the area of community, hospital and clinical pharmacy, a project work shall be carried out under the supervision of a teacher. The project topic must be approved by the Head of the Department or Head of the Institution. The same shall be announced to students within one month of commencement of the fifth year classes. Project work shall be presented in a written report and as a seminar at the end of the year. External and the internal examiners shall do the assessment of the project work.

(2) Project work shall comprise of objectives of the work, methodology, results, discussions and conclusions.

16. Objectives of project work. — The main objectives of the project work is to—

(i) Show the evidence of having made accurate description of published work of others and of having recorded the findings in an impartial manner; and

(ii) Develop the students in data collection, analysis and reporting and interpretation skills.

17. Methodology. — To complete the project work following methodology shall be adopted, namely:—

(i) Students shall work in groups of not less than two and not more than four under an authorised teacher;

(ii) Project topic shall be approved by the Head of the Department or Head of the Institution;

(iii) Project work chosen shall be related to the pharmacy practice in community, hospital and clinical setup. It shall be patient and treatment (Medicine) oriented, like drug utilisation reviews, pharmacoepidemiology, pharmacovigilance or Pharmacoeconomics;

(iv) Project work shall be approved by the institutional ethics committee;

(v) student shall present at least three seminars, one in the beginning, one at middle and one at the end of the project work; and

(vi) two-page write-up of the project indicating title, objectives, methodology anticipated benefits and references shall be submitted to the Head of the Department or Head of the Institution.

18. Reporting. —

(1) Student working on the project shall submit jointly to the Head of the Department or Head of the Institution a project report of about 40-50 pages. Project report should include a certificate issued by the authorised teacher, Head of the Department as well as by the Head of the Institution.

(2) Project report shall be computer typed in double space using Times Roman font on A4 paper. The title shall be in bold with font size 18, sub-tiles in bold with font size 14 and the text with font size 12. The cover page of the project report shall contain details about the name of the student and the name of the authorised teacher with font size 14.

(3) Submission of the project report shall be done at least one month prior to the commencement of annual or supplementary examination.

19. Evaluation. — The following methodology shall be adopted for evaluating the project work—

(i) Project work shall be evaluated by internal and external examiners.

(ii) Students shall be evaluated in groups for four hours (i.e., about half an hour for a group of four students).

(iii) Three seminars presented by students shall be evaluated for twenty marks each and the average of best two shall be forwarded to the university with marks of other subjects.

(iv) Evaluation shall be done on the following items:	Marks
a) Write up of the seminar	(7.5)
b) Presentation of work	(7.5)
c) Communication skills	(7.5)
d) Question and answer skills	(7.5)
Total	(30 marks)

(v) Final evaluation of project work shall be done on the following items:	Marks
a) Write up of the seminar	(17.5)
b) Presentation of work	(17.5)
c) Communication skills	(17.5)
d) Question and answer skills	(17.5)
Total	(70 marks)

Explanation. — For the purposes of differentiation in the evaluation in case of topic being the same for the group of students, the same shall be done based on item numbers b, c and d mentioned above.

P. RAMI REDDY MEMORIAL COLLEGE OF PHARMACY (AUTONOMOUS)

Pharm.D - VI

APPENDIX A
INTERNSHIP

1. SPECIFIC OBJECTIVES:

i) To provide patient care in cooperation with patients, prescribers, and other members of an interprofessional health care team based upon sound therapeutic principles and evidence-based data, taking into account relevant legal, ethical, social cultural, economic, and professional issues, emerging technologies, and evolving biomedical, pharmaceutical, social or behavioral or administrative, and clinical sciences that may impact therapeutic outcomes.

ii) To manage and use resources of the health care system, in cooperation with patients, prescribers, other health care providers, and administrative and supportive personnel, to promote health; to provide, assess, and coordinate safe, accurate, and time-sensitive medication distribution; and to improve therapeutic outcomes of medication use.

iii) To promote health improvement, wellness, and disease prevention in co-operation with patients, communities, at-risk population, and other members of an interprofessional team of health care providers.

iv) To demonstrate skills in monitoring of the National Health Programmes and schemes, oriented to provide preventive and promotive health care services to the community.

v) To develop leadership qualities to function effectively as a member of the health care team organised to deliver the health and family welfare services in existing socio-economic, political and cultural environment.

vi) To communicate effectively with patients and the community.

2. OTHER DETAILS:

i) All parts of the internship shall be done, as far as possible, in institutions in India. In case of any difficulties, the matter may be referred to the Pharmacy Council of India to be considered on merits.

ii) Where an intern is posted to district hospital for training, there shall be a committee consisting of representatives of the college or university, and the district hospital administration, who shall regulate the training of such trainee. For such trainee a certificate of satisfactory completion of training shall be obtained from the relevant administrative authorities which shall be countersigned by the Principal or Dean of College.

iii) Every candidate shall be required, after passing the final Pharm.D. or Pharm.D. (Post Baccalaureate) examination as the case may be to undergo compulsory rotational internship to the satisfaction of the College authorities and University concerned for a period of twelve months so as to be eligible for the award of the degree of Pharm.D. or Pharm.D. (Post Baccalaureate) as the case may be.

3. ASSESSMENT OF INTERNSHIP:

i) The intern shall maintain a record of work which is to be verified and certified by the preceptor (teacher practioner) under whom he works. Apart from scrutiny of the record of work, assessment and evaluation of training shall be undertaken by an objective approach using situation tests in knowledge, skills and attitude during and at the end of the training. Based on the record of work and date of evaluation, the Dean or Principal shall issue certificate of satisfactory completion of training, following which the university shall award the degree or declare him eligible for it.

ii) Satisfactory completion of internship shall be determined on the basis of the following: -

(1) Proficiency of knowledge required for each case management. SCORE 0-5

(2) The competency in skills expected for providing Clinical Pharmacy Services. SCORE 0-5

(3) Responsibility, punctuality, work up of case, involvement in patient care. SCORE 0-5

(4) Ability to work in a team (Behavior with other healthcare professionals including medical doctors, nursing staff and colleagues). SCORE 0-5

(5) Initiative, participation in discussions, research aptitude. SCORE 0-5

Poor	Fair	Below Average	Average	Above Average	Excellent
0	1	2	3	4	5

A Score of less than 3 in any of above items will represent unsatisfactory completion of internship.

APPENDIX - B

20. Internship

Specific Objectives:

(i) To provide patient care in cooperation with patients, prescribers, and other members of an interprofessional health care team based upon sound therapeutic principles and evidence-based data, taking into account relevant legal, ethical, social cultural, economic, and professional issues, emerging technologies, and evolving biomedical, pharmaceutical, social or behavioral or administrative, and clinical sciences that may impact therapeutic outcomes.

(ii) To manage and use resources of the health care system, in cooperation with patients, prescribers, other health care providers, and administrative and supportive personnel, to promote health; to provide, assess, and coordinate safe, accurate, and time-sensitive medication distribution; and to improve therapeutic outcomes of medication use.

(iii) To promote health improvement, wellness, and disease prevention in co-operation with patients, communities, at-risk population, and other members of an interprofessional team of health care providers.

(iv) To demonstrate skills in monitoring of the National Health Programmes and schemes, oriented to provide preventive and promotive health care services to the community.

(v) To develop leadership qualities to function effectively as a member of the health care team organised to deliver the health and family welfare services in existing socio-economic, political and cultural environment.

(vi) To communicate effectively with patients and the community.

Other details

1) All parts of the internship shall be done, as far as possible, in institutions in India. In case of any difficulties, the matter may be referred to the Pharmacy Council of India to be considered on merits.

2) Where an intern is posted to district hospital for training, there shall be a committee consisting of representatives of the college or university, and the district hospital administration, who shall regulate the training of such trainee. For such trainee a certificate of satisfactory completion of training shall be obtained from the relevant administrative authorities which shall be countersigned by the Principal or Dean of College.

3) Every candidate shall be required, after passing the final Pharm.D. or Pharm.D. (Post Baccalaureate) examination as the case may be to undergo compulsory rotational internship to the satisfaction of the College authorities and University concerned for a period of twelve months so as to be eligible for the award of the degree of Pharm.D. or Pharm.D. (Post Baccalaureate) as the case may be.

Assessment of Internship

(i) Each intern student shall have a minimum of 80% attendance in every month, and a total of 80% at end for satisfactory completion of internship.

(ii) The intern shall maintain a record of work which is to be verified and certified by the preceptor (teacher practitioner) under whom he works. Apart from scrutiny of the record of work, assessment and evaluation of training shall be undertaken by an objective approach using situation tests in knowledge, skills and attitude during and at the end of the training. Based on the record of work and date of evaluation, the Dean or Principal shall issue certificate of satisfactory completion of training, following which the university shall award the degree or declare him eligible for it.

(iii) Satisfactory completion of internship shall be determined on the basis of the following:

1. Proficiency of knowledge required for each case management SCORE 0-5
2. The competency in skills expected for providing Clinical Pharmacy Services SCORE 0-5
3. Responsibility, punctuality, work up of case, involvement in patient care SCORE 0-5
4. Ability to work in a team (Behaviour with other healthcare professionals including medical doctors, nursing staff and colleagues). SCORE 0-5
5. Initiative, participation in discussions, research aptitude. SCORE 0-5

Poor	Fair	Below Average	Average	Above Average	Excellent
0	1	2	3	4	5

A Score of less than 3 in any of above items will represent unsatisfactory completion of internship.

21. Transitory regulations:

Candidates who have been detained for want of attendance or not fulfilled academic requirements or who have failed after having undergone the course in earlier regulations or have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects as and when subjects are offered, subject to Section 2. and continue to be in the academic regulations they were first admitted.

22. With – holding of results:

If the candidate has not paid dues to the university or if any case of in-discipline or malpractice is pending against him, the result of the candidate shall be withheld and he will not be allowed/ promoted into the next higher semester. The issue of degree is liable to be withheld in such cases.

23. General:

i. The academic regulations should be read as a whole for purpose of any interpretation.

ii. Disciplinary action for Malpractice / improper conduct in examinations is appended.

iii. Where the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".

iv. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Vice-Chancellor is final.

v. The University may change or amend the academic regulations or syllabi at any time and the changes or amendments shall be made applicable to all the students on roles with effect from the dates notified by the University.

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RULES FOR

DISCIPLINARY ACTION FOR MALPRACTICES / IMPROPER CONDUCT IN EXAMINATIONS

	Nature of Malpractices/Improper conduct	**Punishment**
	If the candidate:	
1.(a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The Hall Ticket of the candidate is to be cancelled and sent to the University.
3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred for four consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for four consecutive semesters from class work and all University examinations, if his involvement is established. Otherwise, the candidate is debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.

4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from classwork and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject only.
6.	Refuses to obey the orders of the Chief Superintendent /Assistant - Superintendent /any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. If the candidate physically assaults the invigilator/ officer-in-charge of the Examinations, then the candidate is also debarred and forfeits his/her seat. In case of outsiders, they will be handed over to the police and a police case is registered against them.
7.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.

9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person (s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject only or in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester / year examinations, depending on the recommendation of the committee.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment.	

Malpractices identified by squad or special invigilators.

i) Punishments to the candidates as per the above guidelines.
ii) Punishment for institutions: (if the squad reports that the college is also involved in encouraging malpractices)
iii) A show cause notice shall be issued to the college.
iv) Impose a suitable fine on the college.
v) Shifting the examination center from the college to another college for a specific period of not less than one year.

Note: Whenever the performance of a student is cancelled in any subject/subjects due to Malpractice, he/she has to register for End Examinations in that subject/subjects consequently and has to fulfil all the norms required for the award of Degree.

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P. RAMI REDDY MEMORIAL COLLEGE OF PHARMACY (AUTONOMOUS), KADAPA.

Pharm. D - IV YEAR / Pharm.D (PB) I Year

(25T00401) PHARMACOTHERAPEUTICS – III (THEORY)

Theory: 3 Hrs. /Week

1. **Scope:** 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.

2. **Objectives:** At completion of this subject it is expected that students will be able to understand –
   a. The pathophysiology of selected disease states and the rationale for drug therapy;
   b. The therapeutic approach to management of these diseases;
   c. The controversies in drug therapy;
   d. The importance of preparation of individualised therapeutic plans based on diagnosis;
   e. Needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects);
   f. Describe the pathophysiology of selected disease states and explain the rationale for drug therapy;
   g. To summarize the therapeutic approach to management of these diseases including reference to the latest available evidence;
   h. To discuss the controversies in drug therapy;
   i. To discuss the preparation of individualised therapeutic plans based on diagnosis; and
   j. Identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).

Etiopathogenesis and pharmacotherapy of diseases associated with following systems/ diseases:

Title of the topic

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, Pancreatitis.

2 **Haematological system:** Anaemias, Venous thromboembolism, Drug induced blood disorders.

3 **Nervous system:** Epilepsy, Parkinsonism, Stroke, Alzheimer's disease,

4 **Psychiatry disorders:** Schizophrenia, Affective disorders, Anxiety disorders, Sleep disorders, Obsessive Compulsive disorders, Alcohol Withdrawal Syndrome.

5 Pain management including Pain pathways, neuralgias, and headaches.
Evidence Based Medicine

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 - Robins 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.

P. RAMI REDDY MEMORIAL COLLEGE OF PHARMACY (AUTONOMOUS), KADAPA.

Pharm. D - IV YEAR / Pharm.D (PB) I Year

(25T00407) PHARMACOTHERAPEUTICS – III (PRACTICAL)

Practical: 3 Hrs./Week

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.

Etiopathogenesis and pharmacotherapy of diseases associated with following systems/ diseases:

Title of the topic

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.
2 **Haematological system:** Anaemias, Venous thromboembolism, Drug induced blood disorders.
3 **Nervous system:** Epilepsy, Parkinsonism, Stroke, Alzheimer's disease,
4 **Psychiatry disorders:** Schizophrenia, Affective disorders, anxiety disorders, sleep disorders, obsessive compulsive disorders
5 Pain management including Pain pathways, neuralgias, and headaches.
6 Evidence Based Medicine

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

P. RAMI REDDY MEMORIAL COLLEGE OF PHARMACY (AUTONOMOUS), KADAPA.

Pharm. D - IV YEAR / Pharm.D (PB) I Year

(25T00402) HOSPITAL PHARMACY (THEORY)

Theory: 2 Hrs. /Week

1. **Scope:** 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 counselling, and therapeutic drug monitoring for improved patient care.

2. **Objectives:** Upon completion of the course, the student shall be able to –
   a. Know various drug distribution methods;
   b. Know the professional practice management skills in hospital pharmacies;
   c. Provide unbiased drug information to the doctors;
   d. Know the manufacturing practices of various formulations in hospital set up;
   e. Appreciate the practice-based research methods; and
   f. Appreciate the stores management and inventory control.

   Text books: (latest editions)
   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

   References:
   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.

3. **Lecture wise programme:**

Topics

1 **Hospital** - its Organisation and functions

Hospital pharmacy-Organisation and management

a) Organizational structure - Staff, Infrastructure & work load statistics
b) Management of materials and finance
c) Roles & responsibilities of hospital pharmacist

2 **The Budget** – Preparation and implementation

Hospital drug policy

a) Pharmacy and Therapeutic committee (PTC)
b) Hospital formulary
c) Hospital committees
   - Infection committee
   - Research and ethical committee
d) developing therapeutic guidelines
e) Hospital pharmacy communication - Newsletter

3 **Hospital pharmacy services**

a) Procurement & warehousing of drugs and Pharmaceuticals
b) Inventory control
   Definition, various methods of Inventory Control ABC, VED, EOQ, Lead time, safety stock
c) Drug distribution in the hospital
   i) Individual prescription method

ii) Floor stock method
iii) Unit dose drug distribution method

d) Distribution of Narcotic and other controlled substances
e) Central sterile supply services – Role of pharmacist

4 Manufacture of Pharmaceutical preparations

a) Sterile formulations – large and small volume parenterals
b) Manufacture of Ointments, Liquids, and creams
c) Manufacturing of Tablets, granules, capsules, and powders
d) Total parenteral nutrition

5 Continuing professional development programs

Education and training
Radio Pharmaceuticals – Handling and packaging
Professional Relations and practices of hospital pharmacist

P. RAMI REDDY MEMORIAL COLLEGE OF PHARMACY (AUTONOMOUS), KADAPA.

Pharm. D - IV YEAR / Pharm.D (PB) I Year

(25T00408) HOSPITAL PHARMACY (PRACTICAL)

Practical: 3 Hrs./Week

1. Assessment of drug interactions in the given prescriptions
2. Manufacture of parenteral formulations, 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 are 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

P. RAMI REDDY MEMORIAL COLLEGE OF PHARMACY (AUTONOMOUS), KADAPA.

Pharm. D - IV YEAR / Pharm.D (PB) I Year

(25T00403) CLINICAL PHARMACY (THEORY)

Theory: 3 Hrs. /Week

1. **Objectives of the Subject:**

Upon completion of the subject student shall be able to (Know, do, appreciate) –

a. Monitor drug therapy of patient through medication chart review and clinical review;
b. Obtain medication history interview and counsel the patients;
c. Identify and resolve drug related problems;
d. Detect, assess and monitor adverse drug reaction;
e. Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states; and
f. Retrieve, analyse, interpret and formulate drug or medicine information.

Text books (Theory)

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. A text book of Clinical Pharmacy Practice; Essential concepts and skills, Dr. G. Parthasarathi et al, Orient Orient Langram Pvt. Ltd. ISSBN8125026

References

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.

2. **Detailed syllabus and lecture wise schedule:**

Title of the topic

1. Definitions, development and scope of clinical pharmacy
   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 counseling
   g. Drug utilisation evaluation (DUE) and review (DUR)
   h. Quality assurance of clinical pharmacy services

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.

2. **Clinical laboratory tests used in the evaluation of disease states, and interpretation of test results**
   a. Haematological, Liver function, Renal function, thyroid function tests
   b. Tests associated with cardiac disorders
   c. Fluid and electrolyte balance
   d. Microbiological culture sensitivity tests
   e. Pulmonary Function Tests

3. **Drug & Poison information**
   a. Introduction to drug information resources available
   b. Systematic approach in answering DI queries
   c. Critical evaluation of drug information and literature
   d. Preparation of written and verbal reports
   e. Establishing a Drug Information Centre
   f. Poisons information- organization & information resources

4. **Pharmacovigilance**
   a. Scope, definition and aims of pharmacovigilance
   b. Adverse drug reactions - Classification, mechanism, predisposing factors, causality assessment [different scales used]
   c. Reporting, evaluation, monitoring, preventing & management of ADRs
   d. Role of pharmacist in management of ADR.

5. Communication skills, including patient counselling techniques, medication history interview, presentation of cases.
   Pharmaceutical care concepts
   Critical evaluation of biomedical literature
   Medication errors

P. RAMI REDDY MEMORIAL COLLEGE OF PHARMACY (AUTONOMOUS), KADAPA.

Pharm. D - IV YEAR / Pharm.D (PB) I Year

(25T00409) CLINICAL PHARMACY (PRACTICAL)

Practical: 3 Hrs./Week

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

a. Answering drug information questions (4 Nos)
b. Patient medication counselling (4 Nos)
c. Case studies related to laboratory investigations (4 Nos)
d. 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 counselling, Critical appraisal of recently published articles in the biomedical literature which deals with a drug or therapeutic issue.

Format of the assignment:

1. Minimum & Maximum number of pages.
2. Reference(s) shall be included at the end.
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.
6. Time allocated for presentation may be 8+2 Min

P. RAMI REDDY MEMORIAL COLLEGE OF PHARMACY (AUTONOMOUS), KADAPA.

Pharm. D - IV YEAR / Pharm.D (PB) I Year

(25T00404) BIOSTATISTICS AND RESEARCH METHODOLOGY (THEORY)

Theory: 2 Hrs. /Week

Detailed syllabus and lecture wise schedule

1. Research Methodology
   a) Types of clinical study designs:
      Case studies, observational studies, interventional studies,
   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

2**. Biostatistics**

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

2.2 **Data graphics**
   Construction and labeling of graphs, histogram, piecharts, scatter plots, semi logarthimic plots

3. **Basics of testing hypothesis**
   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), chi Square test, Analysis of Variance (one-way and two-way)
   c) Level of significance (Non-parametric data)- Sign test, Wilcoxan's signed rank test, Wilcoxan rank sum test, Mann Whitney U test, Kruskal-Wall is test (one way ANOVA)
   d) Linear regression and correlation- Introduction, Pearsonn's and Spearmann's correlation and correlation co-efficient.
   e) Introduction to statistical software: SPSS, Epi Info, SAS.

4. **Statistical methods in epidemiology**
   Incidence and prevalence, relative risk, attributable risk

5. **Computer applications in pharmacy**
   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

Reference books:

a. Pharmaceutical statistics- practical and clinical applications, Sanford Bolton 3rd 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

P. RAMI REDDY MEMORIAL COLLEGE OF PHARMACY (AUTONOMOUS), KADAPA.

Pharm. D - IV YEAR / Pharm.D (PB) I Year

(25T00405) BIOPHARMACEUTICS AND PHARMACOKINETICS (THEORY)

Theory: 3 Hrs. /Week

1. Biopharmaceutics
    1. Introduction to Biopharmaceutics
        a. Absorption of drugs from gastrointestinal tract.
        b. Drug Distribution.
        c. Drug Elimination.
2. Pharmacokinetics
    2. Introduction to Pharmacokinetics.
        a. Mathematical model
        b. Drug levels in blood.
        c. Pharmacokinetic model
        d. Compartment models
        e. Pharmacokinetic study.
3. One compartment open model.
        a. Intravenous Injection (Bolus)
        b. Intravenous infusion.

    Multicompartment models.
        a. Two compartment open model.
        b. IV bolus, IV infusion and oral administration
4. Multiple – Dosage Regimens.
        a. Repititive Intravenous injections – One Compartment Open Model
        b. Repititive Extravascular dosing – One Compartment Open model
        c. Multiple Dose Regimen – Two Compartment Open Model

    Nonlinear Pharmacokinetics.
        a. Introduction
        b. Factors causing Non-linearity.
        c. Michaelis- menton method of estimating parameters.
5. Noncompartmental Pharmacokinetics.
        a. Statistical Moment Theory.
        b. MRT for various compartment models.
        c. Physiological Pharmacokinetic model.

    Bioavailability and Bioequivalence.
        a. Introduction.
        b. Bioavailability study protocol.
        c. Methods of Assessment of Bioavailability

P. RAMI REDDY MEMORIAL COLLEGE OF PHARMACY (AUTONOMOUS), KADAPA.

Pharm. D - IV YEAR / Pharm.D (PB) I Year

(25T00410) BIOPHARMACEUTICS AND PHARMACOKINETICS (PRACTICAL)

Practical: 3 Hrs./Week

1. Improvement of dissolution characteristics of slightly soluble drugs by some methods.
2. Comparison of dissolution studies of two different marketed prod ucts of same drug.
3. Influence of polymorphism on solubility and dissolution.
4. Protein binding studies of a highly protein bound drug and poorly protein bound drug.
5. Extent of plasma-protein binding studies on the same drug (i.e. highly and poorly protein bound drug) at different concentrations in respect of constant time.
6. Bioavailability studies of some commonly used drugs on animal/human model.
7. Calculation of Ka, Ke, t1/2, Cmax, AUC, AUMC, MRT etc. from blood profile data.
8. Calculation of bioavailability from urinary excretion data for two drugs.
9. Calculation of AUC and bioequivalence from the given data for two drugs.
10. In vitro absorption studies.
11. Bioequivalency studies on the different drugs marketed. (eg) Tetracycline, Sulphamethoxzole, Trimethoprim, Aspirin etc., on animals and human volunteers.
12. Absorption studies in animal inverted intestine using various drugs.
13. Effect on contact time on the plasma protein binding of drugs.
14. Studying metabolic pathways for different drugs based on elimination kinetics data.
15. Calculation of elimination half- life for different drugs by using urinary elimination data and blood level data.
16. Determination of renal clearance.

References:

a. Biopharmaceutics and C linical Pharmacokinetics by, Milo Gibaldi
b. Remington's Pharmaceutical Sciences, By Mack Publishing Company, Pennsylvnia.
c. Pharmacokinetics: By Milo Glbaldi Donald, R. Mercel Dekker Inc.
d. Hand Book of Clinical Pharmacokinetics, By Milo Gibaldi and Laurie Prescott by ADIS Health Science Press.
e. Biopharmaceutics and Pharmacokinetics; By Robert F Notari
f. Biopharmaceutics; By Swarbrick
g. Bio pharmaceutics and Pharmacokinetics-A Treatise, By D. M. Brahmankar and Sunil B.Jaiswal, Vallabh Prakashan Pitampura, Delhi
h. Cilincal Pharmacokinetics, Concepts and Applications: By Malcolm Rowland and Thomas, N. Tozen, Lea and Febrger, Philadelphia, 1995.
i. Dissolution, Bioavailability and Bioequivalence, By Abdou H.M, Mack, Publishing Company, Pennsylvania 1989.
j. Biopharmaceutics and Clinical Pharmacokinetics-An introduction 4t h edition Revised and expanded by Rebort F Notari Marcel Dekker Inn, New York and Basel, 1987.
k. Encyclopedia of Pharmaceutical Technology, Vol 13, James Swarbrick, James, C. Roylan, Marcel Dekker Inc, New York 1996.

P. RAMI REDDY MEMORIAL COLLEGE OF PHARMACY (AUTONOMOUS), KADAPA.

Pharm. D - IV YEAR / Pharm.D (PB) I Year

(25T00406) CLINICAL TOXICOLOGY (THEORY)

Theory: 2 Hrs. /Week

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

References:

a. Matthew J Ellenhorn. ELLENHORNS MEDICAL TOXICOLOGY – DIAGNOSIS AND TREATMENT OF POISONING. Second edition. Williams and Willkins publication, London
b. V VPillay. HANDBOOK OF FORENSIC MEDICINE AND TOXICOLOGY. Thirteenth edition 2003 Paras Publication, Hyderabad

P. RAMI REDDY MEMORIAL COLLEGE OF PHARMACY (AUTONOMOUS), KADAPA.

Pharm. D - IV YEAR / Pharm.D (PB) I Year

(25T00411) PHARMACOTHERAPEUTICS I & II (THEORY)

Theory: 3 Hrs/week

Etiopathogenesis and pharmacotherapy of diseases associated with following systems/ diseases.

1. **13 hrs**

Cardiovascular system: Hypertension, Congestive cardiac failure, Angina Pectoris, Myocardial infarction, Hyperlipidaemias, Electrophysiology of heart and Arrhythmias

2. **14 hrs**

Respiratory system: Introduction to Pulmonary function test, Asthma, Chronic obstructive airways disease, Drug induced pulmonary diseases

Endocrine system: Diabetes, Thyroid diseases, Oral contraceptives, Hormone replacement therapy, Osteoporosis

3. **13 hrs**

General prescribing guidelines for

a. Paediatric patients
b. Geriatric patients
c. Pregnancy and breast feeding

Ophthalmology: Glaucoma, Conjunctivitis- viral & bacterial

Introduction to rational drug use Definition, Role of pharmacist Essential drug concept Rational drug formulations

Dermatology: Psoriasis, Scabies, Eczema, Impetigo.

4. **18 hrs**

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

5. **17hrs**

Musculoskeletal disorders : Rheumatoid arthritis, Osteoarthritis, Gout, Spondylitis, Systemic lupus erythematosus.

Renal system: Acute Renal Failure, Chronic Renal Failure, Renal Dialysis, Drug induced renal disorders

Oncology: Basic principles of Cancer therapy, General introduction to cancer chemotherapeutic agents, Chemotherapy of breast cancer, leukemia. Management of chemotherapy nausea and emesis

P. RAMI REDDY MEMORIAL COLLEGE OF PHARMACY (AUTONOMOUS), KADAPA.

Pharm. D - IV YEAR / Pharm.D (PB) I Year

(25T00412) PHARMACOTHERAPEUTICS – I & II (PRACTICAL)

Practicals: 3 Hrs./Week

Practicals:

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 20 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.

Format of the assignment:

1. Minimum & Maximum number of pages.
2. Reference(s) shall be included at the end.
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.
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 are 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).