ADITYA
PHARMACY COLLEGE
(Formerly known as Aditya Institute of Pharmaceutical Sciences & Research)
(An AUTONOMOUS Institution)
• Approved by PCI, New Delhi • Accredited by NAAC "A"Grade
• Permanently Affiliated to JNTUK, Kakinada
Ph: 98665 76663
E-mail: office@adityapharmacy.edu.in
Web: www.adityapharmacy.edu.in
Aditya Nagar, ADB Road, Surampalem – 533437, Kakinada Dist., A.P., INDIA.

Pharm. D

S. No	Course Code	Name of the course that include experiential learning through project work /Internship/Field work	Page No.
54	1.2T	Pharmaceutics Theory	2-10
55	1.5T	Pharmaceutical Inorganic Chemistry Theory	11-17
56	1.1 P	Human Anatomy and Physiology Practical	18-22
57	1.2 P	Pharmaceutics Practical	23-27
58	1.3 P	Medicinal Biochemistry Practical	28-31
59	1.4 P	Pharmaceutical Organic Chemistry Practical	32-36
60	1.5 P	Pharmaceutical Inorganic Chemistry Practical	37-41
61	1.6 P	Biology Practical	42-45
62	2.5 T	Community Pharmacy Theory	46-52
63	2.2 P	Pharmaceutical Microbiology Practical	53-57
64	2.3 P	Pharmacognosy & Phytopharmaceuticals Practical	58-61
65	2.6 P	Pharmacotherapeutics-I Practical	62-66
66	3.3 T	Pharmacotherapeutics-II	67-74
67	3.1 P	Pharmacology-II Practical	75-78
68	3.2 P	Pharmaceutical Analysis Practical	79-81
69	3.3 P	Pharmacotherapeutics-II Practical	82-85
70	3.5 P	Medicinal Chemistry Practical	86-88
71	3.6 P	Pharmaceutical Formulations Practical	89-92
72	4.4 T	Biostatistics & Research Methodology Theory	93-99
73	4.5 T	Biopharmaceutics & Pharmacokinetics Theory	100-106
74	4.1 P	Pharmacotherapeutics-III Practical	107-110
75	4.2 P	Hospital Pharmacy Practical	111-115
76	4.3 P	Clinical Pharmacy Practical	116-120
77	4.5 P	Biopharmaceutics & Pharmacokinetics Practical	121-124

1.2 PHARMACEUTICS (THEORY)

Theory : 2 Hrs. /Week

1. **Scope and objectives:** This course is designed to impart a fundamental knowledge on the art and science of formulating different dosage forms. It prepares the students for most basics of the applied field of pharmacy.

2. **Upon the completion of the course the student should be able to:**
   a. know the formulation aspects of different dosage forms;
   b. do different pharmaceutical caluculation involved in formulation;
   c. formulate different types of dosage forms; and
   d. appreciate the importance of good formulation for effectiveness.

3. **Course materials:**

   Text books
   a. Cooper and Gunns Dispensing for pharmacy students.
   b. A text book Professional Pharmacy by N.K.Jain and S.N.Sharma.

   Reference books
   a. Introduction to Pharmaceutical dosage forms by Howard C. Ansel.
   b. Remington's Pharmaceutical Sciences.
   c. Register of General Pharmacy by Cooper and Gunn.
   d. General Pharmacy by M.L.Schroff.

4. **Lecture wise programme:**

   Topics

   1 a. Introduction to dosage forms - classification and definitions
     b. Prescription: definition, parts and handling
     c. Posology: Definition, Factors affecting dose selection. Calculation of children and infant doses.
   2 Historical back ground and development of profession of pharmacy and pharmaceutical industry in brief.
   3 Development of Indian Pharmacopoeia and introduction to other Pharmacopoeias such as BP, USP, European Pharmacopoeia, Extra pharmacopoeia and Indian national formulary.
   4 Weights and measures, Calculations involving percentage solutions, allegation, proof spirit, isotonic solutions etc.
   5 Powders and Granules: Classification advantages and disadvantages, Preparation of simple, compound powders, Insufflations, Dusting powders, Eutectic and Explosive powders, Tooth powder and effervescent powders and granules.
   6 Monophasic Dosage forms: Theoretical aspects of formulation including adjuvant like stabilizers, colorants, flavours with examples. Study of Monophasic liquids like gargles, mouth washes, Throat paint, Ear drops, Nasal drops, Liniments and lotions, Enemas and collodions.

EVALUATION OF ANTIBIOTIC PRESCRIBING PATTERNS IN A TERTIARY CARE HOSPITAL: A COMPREHENSIVE STUDY BASED ON WHO's AWaRe CLASSIFICATION AND PRESCRIBING INDICATORS

The thesis work submitted to

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-KAKINADA

In Partial Fulfilment of the Requirements for the Award of the Degree of

DOCTOR OF PHARMACY

Submitted by

Ms. Sara Aiswarya Bommeti	(203G1T0002)
Ms. Divya Merugu	(203G1T0011)
Mr. Riton Shil	(203G1T0018)

Under the Esteemed Guidance of

CLINICAL GUIDE

Dr. Praveen Sana

MRCP (UK), CCT (Nephrology)

Sr. Consultant, Nephrologist

Trust Multispeciality Hospitals, Kakinada

INSTITUTIONAL GUIDE

Dr. Pavan Kumar Yanamadala

Pharm. D., (Ph. D.)

Assistant Professor

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DEPARTMENT OF PHARMACY PRACTICE

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Accredited by NAAC with 'A' Grade, Affiliated to JNTUK, Approved by AICTE, PCI, UGC & ISO

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ACADEMIC YEAR 2024-2025

PRINCIPAL
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ADITYA PHARMACY COLLEGE (A)

Accredited by NAAC with 'A' Grade, Affiliated to JNTUK
Approved by AICTE, PCI, UGC & ISO
Aditya Nagar, ADB Road, Surampalem-533437, Andhra Pradesh, India

DECLARATION

We hereby declare that the thesis entitled "EVALUATION OF ANTIBIOTIC PRESCRIBING PATTERNS IN A TERTIARY CARE HOSPITAL: A COMPREHENSIVE STUDY BASED ON WHO's AWaRe CLASSIFICATION AND PRESCRIBING INDICATORS" is a bonafide project work carried out by us, under the esteemed guidance of *Dr. Pavan Kumar Yanamadala, Assistant Professor, Dept. of Pharmacy Practice at Aditya Pharmacy College (A)* and *Dr. Praveen Sana, Senior Consultant, Nephrologist at Trust Multispeciality Hospitals, Kakinada,* in partial fulfillment of the requirements for the award of Doctor of Pharmacy degree from Jawaharlal Nehru Technological University-Kakinada (JNTU-K). We solemnly affirm that the work presented in the thesis is original and has not been submitted in part or full to any other University or Institution for the award of any degree.

Place: Surampalem

Date: 29/03/2025

Sara Aiswarya Bommeti B. Sara Aiswarya

Divya Merugu M. Divya

Riton Shil Riton Shil

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CERTIFICATE BY THE GUIDES

This is to certify that the Project entitled "EVALUATION OF ANTIBIOTIC PRESCRIBING PATTERNS IN A TERTIARY CARE HOSPITAL: A COMPREHENSIVE STUDY BASED ON WHO's AWaRe CLASSIFICATION AND PRESCRIBING INDICATORS" is a bonafide Project work carried out by Ms. Sara Aiswarya Bommeti (Reg. No. 203G1T0002), Ms. Divya Merugu (Reg. No. 203G1T0011), & Mr. Riton Shil (Reg. No. 203G1T0018), under our supervision at the Department of Pharmacy Practice, Aditya Pharmacy College (A), in collaboration with Trust Multispeciality Hospitals, Kakinada. In our opinion, this work embodies substantial quality and meets the standards prescribed by the University for the Award of the degree of Doctor of Pharmacy.

Place: Surampalem & Kakinada

Date: 20/03/2025

Dr. PRAVEEN SANA
CONSULTANT NEPHROLOGIST
MRCP (UK), CCT (NEPHROLOGY)
CLINICAL GUIDE
Reg.No. 50209

Dr. Praveen Sana
MRCP (UK), CCT (Nephrology)
Sr. Consultant, Nephrologist
Trust Multispeciality Hospitals, Kakinada

INSTITUTIONAL GUIDE
Dr. Pavan Kumar Yanamadala
Pharm. D., (Ph. D.)
Assistant Professor
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CERTIFICATE BY THE PRINCIPAL

This is to certify that the thesis work entitled, "EVALUATION OF ANTIBIOTIC PRESCRIBING PATTERNS IN A TERTIARY CARE HOSPITAL: A COMPREHENSIVE STUDY BASED ON WHO's AWaRe CLASSIFICATION AND PRESCRIBING INDICATORS" submitted by Ms. Sara Aiswarya Bommeti (Reg. No. 203G1T0002), Ms. Divya Merugu (Reg. No. 203G1T0011), & Mr. Riton Shil (Reg. No. 203G1T0018), to Jawaharlal Nehru Technological University, Kakinada (JNTUK), is a bonafide project work carried out under the supervision of Dr. Pavan Kumar Yanamadala, Assistant Professor in the Dept. of Pharmacy Practice at Aditya Pharmacy College (A), and Dr. Praveen Sana, Senior Consultant, Nephrologist at Trust Multispeciality Hospitals, Kakinada. The work is submitted in partial fulfilment of the requirements for the award of the degree of Doctor of Pharmacy and has not been submitted previously for any other degree or diploma.

Place: Surampalem

Date: 20/03/2025

Dr. D. Sathis Kumar
M. Pharm, Ph. D.
Professor & Principal
Aditya Pharmacy College (A)
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EVALUATION CERTIFICATE

This is to certify that the thesis work entitled, "EVALUATION OF ANTIBIOTIC PRESCRIBING PATTERNS IN A TERTIARY CARE HOSPITAL: A COMPREHENSIVE STUDY BASED ON WHO's AWaRe CLASSIFICATION AND PRESCRIBING INDICATORS" is a bonafide Project work submitted by Ms. Sara Aiswarya Bommeti (Reg. No. 203G1T0002), Ms. Divya Merugu (Reg. No. 203G1T0011), & Mr. Riton Shil (Reg. No. 203G1T0018), in partial fulfilment of the requirements for the award of the degree of DOCTOR OF PHARMACY to Jawaharlal Nehru Technological University, Kakinada (JNTUK).

Place: Surampalem

Date: 20/03/2025

Internal Examiner

Sign:

External Examiner

Sign:

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INSTITUTIONAL ETHICAL COMMITTEE (IEC)
ADITYA PHARMACY COLLEGE (A)

Approved by PCI, New Delhi; Accredited by NAAC "A" Grade;
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CERTIFICATE OF ETHICAL APPROVAL

Certificate Reference Number: APC-IEC/Pharm. D/2024-25/02

Academic Project Title:
Evaluation of Antibiotic Prescribing Patterns in a Tertiary Care Hospital: A Comprehensive Study based on WHO's AWaRe Classification and Prescribing Indicators.

Principal Investigators:

1. **Academic Guide: Dr. Pavan Kumar Yanamadala**, Assistant Professor, Dept. of Pharmacy Practice, Aditya Pharmacy College (A), Surampalem.
2. **Clinical Guide: Dr. Praveen Sana**, Senior Consultant, Nephrologist at Trust Multispeciality Hospitals. Kakinada.

Co-Investigators (V/VI Pharm. D Students):

1. **Bommeti Sara Aiswarya (Reg. No. 203G1T0002)**
2. **Merugu Divya (Reg. No. 203G1T0011)**
3. **Riton Shil (Reg. No. 203G1T0018)**

Approval Details:
The Institutional Ethics Committee (IEC) reviewed and discussed the proposal to conduct a research study entitled **"Evaluation of Antibiotic Prescribing Patterns in a Tertiary Care Hospital: A Comprehensive Study based on WHO's AWaRe Classification and Prescribing Indicators"** during its meeting on **23-09-2024** at the Board Room, Aditya Pharmacy College (A), Surampalem.

After thorough deliberations, the Committee grants ethical approval for this **Observational study, which is approved for Six (6) months,** subject to adherence to the study protocol and Institutional guidelines.

Ethical Considerations:

- ✓ The study **mustn't involve the collection of Blood/Specimen samples** or any **intervention in the Patient treatment plans**, as it is a purely **Observational** study.
- ✓ Any **changes in the Study Protocol, Informed Consent, or Study Parameters** must be reported to the IEC.
- ✓ The IEC reserves the right to **review the study data** at any stage and **withdraw approval** if ethical concerns arise.

Declaration of Compliance:
The Principal Investigator and Co-Investigators affirm that this study will be conducted in **full compliance** with:

- **Institutional Ethics Committee (IEC) Guidelines.**
- **The Declaration of Helsinki (2013) Ethical Principles.**
- **Good Clinical Practice (GCP) and ICMR Guidelines for Biomedical Research (2023).**

The Institutional Ethics Committee wishes you all the best in your research.

ADITYA PHARMACY COLLEGE (A) IEC SURAMPALEM

24/9/24

Dr. D. Sathis Kumar
Member-Secretary
Institutional Ethical Committee
Aditya Pharmacy College (A), Surampalem

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CONCLUSION

The present study comprehensively evaluated **antibiotic prescribing patterns in a tertiary** :are hospital using the **WHO's AWaRe classification and prescribing indicators**. The results :evealed that the **Watch group antibiotics** were the most frequently prescribed category (**63.9%**), vhile **Access antibiotics** were underutilized (**13.2%**), deviating from WHO recommendations. The :tudy observed that **empirical prescribing** was more common than definitive therapy, with higher :ure rates but at the risk of **inappropriate antibiotic selection**. The findings also highlighted that :ulture-guided prescriptions based on sensitivity reports significantly improved clinical)utcomes, emphasizing the importance of **rational antibiotic prescribing**.

The study's findings indicate that prescribing patterns were predominantly driven by **mpirical therapy**, which, although effective in urgent cases, poses a significant risk of **antimicrobial** esistance if not adjusted based on culture sensitivity reports. The statistical analysis demonstrated a **trong association between prescribing patterns and clinical outcomes**, particularly with the :pe of antibiotics, sensitivity patterns, and combination therapies. The **overuse of Watch and** :eserve **antibiotics** further highlights the urgent need for strengthening **Antimicrobial** tewardship **Programs (ASPs)** to promote the rational use of antibiotics.

Despite the study's comprehensive approach, limitations such as **hospital-specific data**,)ort **study duration**, and the lack of **long-term patient outcomes** need to be considered when :neralizing the findings.

Based on the study's findings, the following recommendations can be proposed to optimize tibiotic prescribing practices:

- Implement **Antimicrobial Stewardship Programs (ASPs)** to improve adherence to the **WHO AWaRe guidelines.**
- Enhance **culture sensitivity testing facilities** to promote definitive therapy and reduce empirical prescribing.
- Organize **educational interventions** and workshops for healthcare professionals on **rational antibiotic use.**
- Develop **hospital-specific antibiotic prescribing guidelines** aligned with WHO recommendations.
- Encourage the use of **Access group antibiotics** as first-line options for mild infections.
- Conduct **regular prescription audits** with feedback systems to monitor prescribing patterns and improve rational prescribing.

This study highlights the critical role of **rational antibiotic prescribing** in improving patient utcomes and combating **antimicrobial resistance.** The findings provide **evidence-based insights** hat can strengthen **hospital-based antimicrobial stewardship programs** and serve as a foundation or future initiatives aimed at **optimizing antibiotic use in tertiary care hospitals,** ultimately ontributing to the **global fight against antimicrobial resistance.**

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1.5 PHARMACEUTICAL INORGANIC CHEMISTRY (THEORY)

Theory : 2 Hrs. /Week

1. **Scope and objectives:** This course mainly deals with fundamentals of Analytical chemistry and also the study of inorganic pharmaceuticals regarding their monographs and also the course deals with basic knowledge of analysis of various pharmaceuticals.

2. **Upon completion of the course student shall be able to:**
   a. under stand the principles and procedures of analysis of drugs and also regarding the application of inorganic pharmaceuticals;
   b. know the analysis of the inorganic pharmaceuticals their applications; and
   c. appreciate the importance of inorganic pharmaceuticals in preventing and curing the disease.

3. **Course materials:**

   Text books
   a. A text book Inorganic medicinal chemistry by Surendra N. Pandeya
   b. A. H. Beckett and J. B. Stanlake's Practical Pharmaceutical chemistry Vol-I & Vol-II
   c. Inorganic Pharmaceutical Chemistry III-Edition P.Gundu Rao

   Reference books
   a. Inorganic Pharmaceutical Chemistry by Anand & Chetwal
   b. Pharmaceutical Inorganic chemistry by Dr.B.G.Nagavi
   c. Analytical chemistry principles by John H. Kennedy
   d. I.P.1985 and 1996, Govt. of India, Ministry of health

4. **Lecture wise programme:**

   Topics
   1 Errors
   2 Volumetric analysis
   3 Acid-base titrations
   4 Redox titrations
   5 Non aqueous titrations
   6 Precipitation titrations
   7 Complexometric titrations
   8 Theory of indicators
   9 Gravimetry
   10 Limit tests
   11 Medicinal gases
   12 Acidifiers
   13 Antacids
   14 Cathartics
   15 Electrolyte replenishers

A Comparative Analysis of Non-Invasive Methods for Liver Fibrosis Assessment in NAFLD Patients: FIB-4 Index vs. FibroScan

The thesis work submitted to

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-KAKINADA

In partial fulfilment for the award of the Degree of

DOCTOR OF PHARMACY

Submitted by

PETTA SHINY	(203G1T0012)
RAJANA PADMAJA	(203G1T0016)
GANDI SOWJANYA	(203G1T0020)

Under the esteemed guidance of

CLINICAL GUIDE

Dr. R. SRINIVAS MURTY

MBBS, MD(AIIMS), DM(AIIMS)

Sr. Consultant Gastroenterologist Hepatologist

Trust Multi-Speciality Hospitals, Kakinada

ACADEMIC GUIDE

Dr. M. KARTHIK, Pharm D

Assistant Professor

Aditya Pharmacy College (A), Surampalem

DEPARTMENT OF PHARMACY PRACTICE

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2025

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Approved by AICTE, PCI, UGC & ISO

Aditya Nagar, ADB Road, Surampalem-533437, Andhra Pradesh, India

DECLARATION

We hereby declare that the thesis entitled " A COMPARATIVE ANALYSIS OF NON – INVASIVE METHODS FOR LIVER FIBROSIS ASSESSMENT IN NAFLD PATIENTS: FIB – 4 INDEX VS FIBROSCAN " is a Bonafide project work carried out by us under the guidance of ***Dr. M. Karthik, Assistant Professor, Department of Pharmacy Practice, Aditya Pharmacy College (A)*** and ***Dr. R. Srinivas Murty, Senior Consultant Gastroenterologist and Hepatologist at Trust Multispecialty Hospitals, Kakinada,*** in partial fulfillment of the requirements for the Award of the Degree of **Doctor of Pharmacy** in the Department of Pharmacy Practice to **Jawaharlal Nehru Technological University-Kakinada (JNTU-K)**. The work embodied in this thesis is original and has not been submitted in part or in full for any degree of this or any other university.

Place: Surampalem

Date: 20-03-2025

PETTA SHINY _____

RAJANA PADMAJA _____

GANDI SOWJANYA _____

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CERTIFICATE BY THE GUIDES

This is to certify that the thesis work entitled "A COMPARATIVE ANALYSIS OF NON – INVASIVE METHODS FOR LIVER FIBROSIS ASSESSMENT IN NAFLD PATIENTS: FIB – 4 INDEX VS FIBROSCAN " is a bonafide Project work carried out by **PETTA SHINY (Reg. No. 203G1T0012), RAJANA PADMAJA (Reg. No. 203G1T0016), GANDI SOWJANYA (Reg. No. 203G1T0020)**, under the guidance of us at the Department of Pharmacy Practice, Aditya Pharmacy College (A), and Dept. of Gastroenterology and Hepatology, Trust Multispecialty Hospitals, Kakinada. In our opinion, this work has reached the standards in fulfillment of the partial requirement for the award of the degree of **Doctor of Pharmacy** per the regulations of the University.

Place: Surampalem & Kakinada

Date: 20-03-2025

ACADEMIC GUIDE

Dr. R. SRINIVAS MURTY

MBBS, MD, DM
Sr. Consultant Gastroenterologist
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Aditya Nagar, ADB Road, Surampalem-533437, Andhra Pradesh, India

CERTIFICATE BY THE PRINCIPAL

This is to certify that the thesis work entitled, "A COMPARATIVE ANALYSIS OF NON – INVASIVE METHODS FOR LIVER FIBROSIS ASSESSMENT IN NAFLD PATIENTS: FIB – 4 INDEX VS FIBROSCAN " is being submitted by **PETTA SHINY (Reg. No. 203G1T0012), RAJANA PADMAJA (Reg. No. 203G1T0016), GANDI SOWJANYA (Reg. No. 203G1T0020),** to **Jawaharlal Nehru Technological University,** Kakinada (JNTUK), in partial fulfillment for the award of the degree of **DOCTOR OF PHARMACY** in the **Department of Pharmacy Practice** under the guidance of **Dr. D. Sathis Kumar,** M. Pharm., Ph. D., Professor & Principal, is the bonafide project work carried out by them at Aditya Pharmacy College (A), Surampalem & Trust Multispeciality Hospitals, Kakianda.

The results incorporated in this work have not been submitted to any other university or institute for the award of any degree.

Dr. D. Sathis Kumar,
M. Pharm., Ph. D.,
PRINCIPAL
Aditya Pharmacy College (A),
SURAMPALEM
Aditya Pharmacy College (A),
Surampalem-533437

Place: Surampalem

Date: 20-03-2025

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EVALUATION CERTIFICATE

This is to certify that the thesis work entitled, "A COMPARATIVE ANALYSIS OF NON – INVASIVE METHODS FOR LIVER FIBROSIS ASSESSMENT IN NAFLD PATIENTS: FIB – 4 INDEX Vs FIBROSCAN " is a bonafide Project work done by PETTA SHINY (Reg. No. 203G1T0012), RAJANA PADMAJA (Reg. No. 203G1T0016), GANDI SOWJANYA (Reg. No. 203G1T0020) submitted in partial fulfilment for the award of the degree of DOCTOR OF PHARMACY in the Department of Pharmacy Practice to Jawaharlal Nehru Technological University, Kakinada (JNTUK).

Place: Surampalem

Date: 20-03-2025

Internal Examiner Signature

External Examiner Signature

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ADITYA PHARMACY COLLEGE(A)
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Conclusion:

In conclusion, our study reaffirms the utility of FIB-4 as a non-invasive, accessible screening tool for liver fibrosis in NAFLD patients, particularly in resource-limited settings. However, its limitations in distinguishing intermediate fibrosis stages necessitate the use of FibroScan for confirmatory diagnosis. Our findings align with previous research emphasizing the correlation between FIB-4 and FibroScan, while also highlighting the strong association between fibrosis severity and metabolic comorbidities. By integrating FIB-4 as a primary screening method and FibroScan as a secondary confirmatory tool, a structured, cost-effective, and clinically efficient approach can be established for the early detection and management of liver fibrosis in NAFLD patients. Future research should focus on optimizing FIB-4 cutoff values, incorporating additional biomarkers, and developing risk-stratification models that integrate both hepatic and cardiovascular health parameters to enhance the precision of non-invasive fibrosis assessment. Additionally, public health strategies in India should aim to improve awareness and early detection efforts to reduce the long-term burden of NAFLD-related complications.

1.1 HUMAN ANATOMY & PHYSIOLOGY (PRACTICAL)

Practical : 3 Hrs./Week

General Requirements: Dissection box, Laboratory Napkin, muslin cloth, record, Observation book(100pages), Stationary items, Blood lancet.

Course materials:

Text books

Goyal, R. K, Natvar M.P, and Shah S.A, Practical anatomy, physiology and biochemistry, latest edition, Publisher: B.S Shah Prakashan, Ahmedabad.

Reference books

Ranade VG, Text book of practical physiology, Latest edition, Publisher: PVG, Pune
Anderson Experimental Physiology, Latest edition, Publisher: NA

List of Experiments:

1. Study of tissues of human body
   (a) Epithelial tissue.
   (b) Muscular tissue.
2. Study of tissues of human body
   (a) Connective tissue.
   (b) Nervous tissue.
3. Study of appliances used in hematological experiments.
4. Determination of W.B.C. count of blood.
5. Determination of R.B.C. count of blood.
6. Determination of differential count of blood.
7. Determination of
   (a) Erythrocyte Sedimentation Rate.
   (b) Hemoglobin content of Blood.
   (c) Bleeding time & Clotting time.
8. Determination of
   (a) Blood Pressure.
   (b) Blood group.
9. Study of various systems with the help of charts, models & specimens
   (a) Skeleton system part I-axial skeleton.
   (b) Skeleton system part II- appendicular skeleton.
   (c) Cardiovascular system.
   (d) Respiratory system.

(e) Digestive system.
(f) Urinary system.
(g) Nervous system.
(h) Special senses.
(i) Reproductive system.

10. Study of different family planning appliances.
11. To perform pregnancy diagnosis test.
12. Study of appliances used in experimental physiology.
13. To record simple muscle curve using gastroenemius sciatic nerve preparation.
14. To record simple summation curve using gastroenemius sciatic nerve preparation.
15. To record simple effect of temperature using gastroenemius sciatic nerve preparation.
16. To record simple effect of load & after load using gastroenemius sciatic nerve preparation.
17. To record simple fatigue curve using gastroenemius sciatic nerve preparation.

Scheme of Practical Examination:

	Sessionals	**Annual**
Identification	04	10
Synopsis	04	10
Major Experiment	07	20
Minor Experiment	03	15
Viva	02	15
Max Marks	**20**	**70**
Duration	**03hrs**	**04hrs**

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

PRINCIPAL
ADITYA PHARMACY COLLEGE(A),
SURAMPALEM-533 437

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Aditya Nagar, ADB Road, Surampalem. Kakinada Dist., A.P.

Program

PHARM - D

Certified that this is the bonafide record of practical work done by

Mr./Ms. Karanam Durgarani

with Roll No. 243G1T0014 a student of I St pharm.D Semester

in the Human Anatomy & physiology course during the Academic Year 2024-2025

No. of Experiments Conducted 29

No. of Experiments Completed 29

Faculty incharge

Principal

ADITYA PHARMACY COLLEGE(A)
SURAMPALEM-533 437

Submitted for the practical examination held on .....

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SURAMPALEM-533 437

Examiner -1

Examiner -2

INDEX

S.No	Date	Name of the Experiment	Page No.	Marks	Signature
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2.	18-12-24	Microscopic study of epithelial of Connective tissue.	5-14	A	
3.	29-12-24	Microscopic Study of muscle of Nervous Tissue	15-18	A	
4.	5-2-25	Estimation of Bleeding Time	19-20	A+	
5.	12-2-25	Determination of clotting time.	21	A+	
6.	19-2-25	Determination of Breath-holding time.	22	A+	
7.	5-3-25	Determination of Rate of Respiration	23	A+	
8.	19-3-25	Determination of Human blood Group	24-25	A+	
9.	29-3-25	Estimation of haemoglobin content.	26-28	A+	
		Study of haemacytometry	29-32		
10.	9-4-25	Enumeration of total RBC-count.	33-35	A+	
11.	16-4-25	Enumeration of total WBC-count.	36-40	A+	
12.	23-4-25	Determination of Erythrocyte.	41-45	A	
		Sedimentation Rate			
13.	30-4-25	Determination of Blood pressure	46-49	A+	
14.	7-5-25	Identification of slides.	50-54	A	
15.	14-5-25	Nervous system.	55	A	
16.	14-5-25	Male Reproductive system	56	A	
17.	4-6-25	Female Reproductive system.	57	A	

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S.No	Date	Name of the Experiment	Page No.	Marks	Signature
18.	4-6-25	Cardio Vascular System	58-59	A	
19.	25-6-25	Respiratory System.	60-61	A	
20.	25-6-25	Organs of Special Senses	62-64	A	
21.	2-7-25	Urinary System	65-66	A	
22.	2-7-25	Digestive system	67-69	A	
23.	9-7-25	Skeletal - Axial System	70-72	A	
24.	16-7-25	Skeletal-Appendicular system	73-76	A	
25.	23-7-25	Study of different family planning Appliances	77-80	A	
26.	30-7-25	pregnancy diagnosis Test Appliances used in Experimental physiology.	81-82 83	A	
27.	6-8-25	Record of simple muscle twitch.	84-85	A	
28.	13-8-25	phenomenon of Fatigue	86-87	A	
29.	20-8-25	Determination of Differential Leucocytes	88-91	A	

7 Biphasic dosage forms: Suspensions and emulsions, Definition, advantages and disadvantages, classification, test for the type of emulsion, formulation, stability and evaluation.
8 Suppositories and pessaries: Definition, advantages and disadvantages, types of base, method of preparation, Displacement value and evaluation.
9 Galenicals: Definition, equipment for different extraction processes like infusion, Decoction, Maceration and Percolation, methods of preparation of spirits, tinctures and extracts.
10 Pharmaceutical calculations.
11 Surgical aids: Surgical dressings, absorbable gelatin sponge, sutures, ligatures and medicated bandages.
12 Incompatibilities: Introduction, classification and methods to overcome the incompatibilities.

1.2 PHARMACEUTICS (PRACTICAL)

Practical : 3 Hrs./Week

List of Experiments:

1. **Syrups**
   a. Simple Syrup I.P
   b. Syrup of Ephedrine Hcl NF
   c. Syrup Vasaka IP
   d. Syrup of ferrous Phosphate IP
   e. Orange Syrup
2. **Elixir**
   a. Piperizine citrate elixir BP
   b. Cascara elixir BPC
   c. Paracetamol elixir BPC
3. **Linctus**
   a. Simple Linctus BPC
   b. Pediatric simple Linctus BPC
4. **Solutions**
   a. Solution of cresol with soap IP
   b. Strong solution of ferric chloride BPC
   c. Aqueous Iodine Solution IP
   d. Strong solution of Iodine IP
   e. Strong solution of ammonium acetate IP

5. **Liniments**
   a. Liniment of turpentine IP*
   b. Liniment of camphor IP
6. **Suspensions***
   a. Calamine lotion
   b. Magnesium Hydroxide mixture BP
7. **Emulsions***
   a. Cod liver oil emulsion
   b. Liquid paraffin emulsion
8. **Powders♣**
   a. Eutectic powder
   b. Explosive powder
   c. Dusting powder
   d. Insufflations
9. **Suppositories♣**
   a. Boric acid suppositories
   b. Chloral suppositories
10. **Incompatibilities**
    a. Mixtures with Physical
    b. Chemical & Therapeutic incompatibilities

* colourless bottles required for dispensing ♣ Paper envelope (white), butter paper and white paper required fo. dispensing.

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	**03hrs**	**04hrs**

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

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PHARM-D

Certified that this is the bonafide record of practical work done by

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with Roll No. 243G1T0018 a student of 1st PharmD Semester

in the Pharmaceutics course during the Academic Year 2024-2025

No. of Experiments Conducted 31

No. of Experiments Completed 31

G. Sai devi
Faculty incharge 26/8/25

Principal
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SURAMPALEM-533 437

Submitted for the practical examination held on 11-09-25

11/9/25
Examiner -1

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Examiner -2

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S.No	Date	Name of the Experiment	Page No.	Marks	Signature
I.	28/12-24	Introduction and General Procedure for writing Experiments	1-2		
II.	4-01-25	Syrup Introduction	3-5		
01.	4-01-25	Preparation of simple syrup	6	A+	
02.	25-1-25	Preparation of Vasaka Syrup	7-8	A++	
03.	25-1-25	Preparation of Orange syrup	9	A+	
04.	08-2-25	Preparation of Compound Ferrous Phosphate syrup (B.P.C)	10-12 13-14	A+	
05.	08-02-25	Ephedrine Hydrochloride syrup (I.P)	13-14	A+	
III.	15-02-25	Elixirs Introduction.	15		
06.	15-02-25	Paracetmol Pediatric Elixir (BPC)	16-17	A++	
07.	22-2-25	Piperazine Citrate Elixir (BPC)	18-19	A+	
08.	22-2-25	Cascara Elixir (BPC)	20-21	A+	
IV.	1-3-25	Linctus Introduction	22.		
09.	1-3-25	Simple Linctus (BPC)	23	A+	
10.	28-3-25	Pediatric Simple Linctus	24	A++	
V	28-3-25	Solutions Introduction	25		
11.	12-4-25	Aqueous Iodine Solution (IP)	26-27	A+	
12.	12-4-25	Strong Iodine Solution (IP)	28-29	A++	
13.	12-4-25	Cresol Soap Solution	30-31	A+	
14.	19-4-25	Strong Ammonium Acetate Solution (IP)	32-33	A+	
VI	19-4-25	Liniments Introduction	34		
15.	19-4-25	Camphor Liniment (IP)	35-36	A	
16.	2-5-25	Turpentine Liniment (IP)	37-38	A+	
VII	2-5-25	Suspensions Introduction	39-40		
17.	2-5-25	Calamine Lotion	41-42	A+	
18.	2-5-25	Magnesium Hydroxide Mixture	43-45	A+	

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S.No	Date	Name of the Experiment	Page No.	Marks	Signature
VIII	10-5-25	Emulsions Introduction	46-47		
19.	10-5-25	Liquid Paraffin Emulsion	48-49	A+	
20.	10-5-25	COD Liver Oil Emulsion	50-51	A++	4/8/25
IX	21-7-25	Powders Introduction	52-53		
21.	21-7-25	Zinc Oxide Starch Dusting Powder (NFI)	54	A++	
22.	21-7-25	Eutectic Powder.	55-56	A+	11/8/25
23.	28-7-25	Explosive Powder.	57-58	A	
X	28-7-25	Suppositories Introduction	59-61		
24.	4-8-25	Boric Acid Suppositories	62-63	A+	
25.	4-8-25	Chloral Hydrate Suppositories	64-65	A+	18/8/25
XI	4-8-25	Incompatibilities Introduction	66		
26.	11-8-25	Mixture-I	67-	A	
27.	11-8-25	Emulsion	68	A+	
28.	18-8-25	Mixture-II	69	A	
29.	18-8-25	Mixture-III	70	A+	26/8/25
30.	25-8-25	Spray Solution	71	A+	
31.	25-8-25	The Powder.	72	A	

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1.3 MEDICINAL BIOCHEMISTRY (PRACTICAL)

Practical : 3 Hrs./Week

Title of the Experiment:

1 Qualitative analysis of normal constituents of urine.*
2 Qualitative analysis of abnormal constituents of urine.*
3 Quantitative estimation of urine sugar by Benedict's reagent method.**
4 Quantitative estimation of urine chlorides by Volhard's method.**
5 Quantitative estimation of urine creatinine by Jaffe's method.**
6 Quantitative estimation of urine calcium by precipitation method.**
7 Quantitative estimation of serum cholesterol by Libermann Burchard's method.**
8 Preparation of Folin Wu filtrate from blood.*
9 Quantitative estimation of blood creatinine.**
10 Quantitative estimation of blood sugar Folin-Wu tube method.**
11 Estimation of SGOT in serum.**
12 Estimation of SGPT in serum.**
13 Estimation of Urea in Serum.**
14 Estimation of Proteins in Serum.**
15 Determination of serum bilirubin**
16 Determination of Glucose by means of Glucoseoxidase.**
17 Enzymatic hydrolysis of Glycogen/Starch by Amylases.**
18 Study of factors affecting Enzyme activity. (pH & Temp.)**
19 Preparation of standard buffer solutions and its pH measurements (any two)*
20 Experiment on lipid profile tests**
21 Determination of sodium,calcium and potassium in serum.**

** indicate major experiments & * indicate minor experiments

Assignments:

Format of the assignment

1. Minimum & Maximum number of pages.
2. It shall be computer draft copy.
3. Reference(s) shall be included at the end.
4. Name and signature of the student.
5. Assignment can be a combined presentation at the end of the academic year.
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	**03hrs**	**04hrs**

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

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Program

Pharm-D

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Mr./Ms. AKULA VEERA GANESH

with Roll No. 243G1T0002 a student of 1st Pharm-D Semester

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No. of Experiments Conducted 22

No. of Experiments Completed 17

29/08/2025

Faculty incharge

Principal

Submitted for the practical examination held on 13-09-2025

Examiner -1

ADITYA PHARMACY COLLEGE SURAMPALEM 533 437

Examiner -2

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Sahasra

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S.No	Date	Name of the Experiment	Page No.	Marks	Signature
i,	16-12-24	General Instructions	1-2	A	23/12/24
(1)	23-12-24	Qualitative Analysis of Normal Constituents of Urine	3-7	A	6/1/25
(2)	30-12-24	Qualitative Analysis of Abnormal Constituents of Urine	8-12	A	
(3)	06-01-25	Qualitative estimation of Glucose and Urine by Benidicts reagent method.	13-14	A	3/2/25
(4)	27-01-25	Quantitative Estimation of Urine by Volhard's Method.	15-16	A	
(5)	03-02-25	Quantitative Estimation of Creatinine in Urine by Jaffe's Method.	17-18	A	10/2/25
(6)	10-02-25	Quantitative Estimation of Urine Calcium by Precipitation Method.	19	A	
(7)	17-02-25	Quantitative Estimation of Blood Creatinine	20-21	A	24/3/25
(8)	24-02-25	Quantitative Estimation of Serum Cholesterol by Libermann Buschads Method.	22-	A	
(9)	24-03-25	Preparation of Protein Free	23-24	A	7/4/25
(10)	07-04-25	Quantitative Estimation of Blood sugar by Folin-WU method	25-26	A	21/4/25
(11)	21-04-25	Estimation of SGOT in serum	27-28	A	
(12)	28-04-25	Estimation of SGPT in serum	29-30	A	
(13)	05-05-25	Estimation of Urea in serum	31-33	A	[illegible]/25
(14)	02-06-25	Estimation of total protein in serum by Biuret Method.	34-35	A	

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S.No	Date	Name of the Experiment	Page No.	Marks	Signature
(15)	23-06-25	Quantitative Estimation of Cholesterol in serum	36-37	A	27/6/25
(16)	27-06-25	Determination of Serum Bilirubin	38-39	A	
(17)	04-07-25	Determination of Glucose by means of Glucose Oxidase.	40-41	A	4/7/25
(18)	04-07-25	Enzymatic hydrolysis of Glycogen / Staich By Analyses	42-43	A	
(19)	18-07-25	Study of Temperature Affecting Enzyme Activity.	44-45	A	25/7/25
(20)	25-07-25	Preparation of Standard Buffer and its Measurement.	46-47	A	1/8/25
(21)	01-08-25	Determination of Calcium present in serum.	48-49	A	
(22)	08-08-25	Determination of Sodium and Potassium in Serum	50-51	A	8/8/25

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12 Mechanism of aldol condensation, claisen condensation, cannizzaro reaction, crossed aldol condensation, crossed cannizzaro reaction, benzoin condensation, perkin condensation. Knoevenagel, Reformatsky reaction, Wittig reaction, Michael addition.

13 Hoffman rearrangement: Migration to electron deficient nitrogen, Sandmeyer's reaction, basicity of amines, diazotisation and coupling, acidity of phenols, Williamson synthesis, Fries rearrangement, Kolbe reaction, Reimer tieman's reactions.

14 Nucleophilic aromatic substitution: Bimolecular displacement mechanisms, orientation, comparison of aliphatic nucleophilic substitution with that of aromatic.

15 Oxidation reduction reaction.

16 Study of the following official compounds- preparation, test for purity, assay and medicinal uses of Chlorbutol, Dimercaprol, Glyceryl trinitrate, Urea, Ethylene diamine dihyrate, Vanillin, Paraldehyde, Ethylene chloride, Lactic acid, Tartaric acid, citric acid, salicylic acid, aspirin, methyl salicylate, ethyl benzoate, benzyl benzoate, dimethyl pthalate, sodium lauryl sulphate, saccharin sodium, mephensin.

1.4 PHARMACEUTICAL ORGANIC CHEMISTRY (PRACTICAL)

Practical : 3 Hrs./Week

I. Introduction to the various laboratory techniques through demonstration involving synthesis of the following compounds (at least 8 compounds to be synthesised):

1. Acetanilde / aspirin (Acetylation)
2. Benzanilide / Phenyl benzoate (Benzoylation)
3. P-bromo acetanilide / 2,4,6 – tribromo aniline (Bromination)
4. Dibenzylidene acetone (Condensation)
5. 1-Phenylazo-2-napthol (Diazotisation and coupling)
6. Benzoic acid / salicylic acid (Hydrolysis of ester)
7. M-dinitro benzene (Nitration)
8. 9, 10 – Antharaquinone (Oxidation of anthracene) / preparation of benzoic acid from toluene or benzaldehyde
9. M-phenylene diamine (Reduction of M-dinitrobenzene) / Aniline from nitrobenzene
10. Benzophenone oxime
11. Nitration of salicylic acid
12. Preparation of picric acid
13. Preparation of O-chlorobenzoic acid from O-chlorotolune
14. Preparation of cyclohexanone from cyclohexanol

II. Identification of organic compounds belonging to the following classes by :

Systematic qualitative organic analysis including preparation of derivatives Phenols, amides, carbohydrates, amines, carboxylic acids, aldehyde and ketones, Alcohols, esters, hydrocarbons, anilides, nitrocompounds.

III. Introduction to the use of stereo models:

Methane, Ethane, Ethylene, Acetylene, Cis alkene, Trans alkene, inversion of configuration.

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	**03hrs**	**04hrs**

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

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Program

PHARM-D

Certified that this is the bonafide record of practical work done by

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with Roll No. 243G1T0018 a student of 1st Pharm D Semester

in the ORGANIC CHEMISTRY course during the Academic Year 2024-2025

No. of Experiments Conducted 20

No. of Experiments Completed 20

Faculty incharge

Principal

PRINCIPAL
ADITYA PHARMACY COLLEGE(A)
SURAMPALEM-533 437

Submitted for the practical examination held on 10-09-25

Examiner -1

Examiner -2

ADITYA PHARMACY COLLEGE SURAMPALEM 533 437

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i	27-12-24	chemistry laboratory rules and safety precautions	01		
ii	3-01-25	Basic laboratory techniques for separation and purification	02-08		
I.		Acetylation	09		
01	24-01-25	Preparation of Aspirin	10		
02	31-01-25	Preparation of Acetanilide	11		
II		Benzoylation	12		
03	07-02-25	Preparation of Benzanilide	13		
04	14-02-25	Preparation of Benzophenone oxime	14		
III		Nitration of Aromatic Hydrocarbons	15		
05	21-02-25	Preparation of Nitrobenzene	16-17		
IV		Bromination	18		
06	28-02-25	Preparation of para Bromo Acetenailide	19		
07	02-04-25	Preparation of Phenyl AZO-B napthol from Aniline	20-21		
08	25-04-25	Preparation of Benzoic acid from Benzanilide	22		
09	3-05-25	Preparation of Picric acid	23		
V	9-05-25	Systematic qualitative Analysis of Organic compound	24-47		
10	6-06-25	Sample-1	48-51		
11	26-06-25	Sample-2	52-55		
12	3-07-25	Sample-3	56-60		
13	10-07-25	Sample-4	61-64		
14	17-07-25	Sample-5	65-68		
15	24-07-25	Sample-6	69-72		

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INDEX

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17	07-08-25	Sample - 8	77-79		
18	14-08-25	Sample - 9	80-83		
19	21-08-25	Sample - 10	84-87		
20	28-08-25	Stereo models	88-89		

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16 Essential Trace elements
17 Antimicrobials
18 Pharmaceutical aids
19 Dental Products
20 Miscellaneous compounds
21 Radio Pharmaceuticals

1.5 PHARMACEUTICAL INORGANIC CHEMISTRY (PRACTICAL)

Practical : 3 Hrs./Week

1. **Limit test (6 exercises)**
   a. Limit test for chlorides
   b. Limit test for sulphates
   c. Limit test for iron
   d. Limit test for heavy metals
   e. Limit test for arsenic
   f. Modified limit tests for chlorides and sulphates

2. **Assays (10 exercises)**
   a. Ammonium chloride- Acid-base titration
   b. Ferrous sulphate- Cerimetry
   c. Copper sulpahte- Iodometry
   d. Calcilugluconate- Complexometry
   e. Hydrogen peroxide – Permanganometry
   f. Sodium benzoate – Nonaqueous titration
   g. Sodium chloride – Modified volhard's method
   h. Assay of KI – KIO_3 titration
   i. Gravimetric estimation of barium as barium sulphate
   j. Sodium antimony gluconate or antimony potassium tartarate

3. **Estimation of mixture (Any two exercises)**
   a. Sodium hydroxide and sodium carbonate
   b. Boric acid and Borax
   c. Oxalic acid and sodium oxalate

4. **Test for identity (Any three exercises)**
   a. Sodium bicorbonate
   b. Barium sulphate
   c. Ferrous sulphate
   d. Potassium chloride

5. **Test for purity (Any two exercises)**
   a. Swelling power in Bentonite
   b. Acid neutralising capacity in aluminium hydroxide gel
   c. Ammonium salts in potash alum
   d. Adsorption power heavy Kaolin
   e. Presence of Iodates in KI

6. **Preparations (Any two exercises)**
   a. Boric acids
   b. Potash alum
   c. Calcium lactate
   d. Magnesium suphate

Scheme of Practical Examination :

	Sessionals	**Annual**
Synopsis	05	15
Major Experiment	10	25
Minor Experiment1&2	03	15
Viva	02	15
Max Marks	**20**	**70**
Duration	**03hrs**	**04hrs**

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

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Program

PHARM-D

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with Roll No. 245GIT0018 a student of I^st Pharm D Semester

in the INORGANIC CHEMISTRY course during the Academic Year 2024-2025

No. of Experiments Conducted 25

No. of Experiments Completed 25

Faculty Incharge

Principal

Submitted for the practical examination held on 12-09-25

G. V. Lakshmi

Examiner -1

Examiner -2

PRINCIPAL
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SURAMPALEM-533 437

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1.	24-12-24	Calibration of Analytical Apparatus	5-8	~~10~~	24/12
2.	31-12-24	Standardisation of HCl	9-10	~~A++~~	
3.	21-01-2025	Assay of Borax	73-74	~~A++~~	
4.	28-01-25	Assay of Boric Acid	11-12	~~A++~~	
5.	04-2-25	Assay of Ammonium Chloride	13-14	~~A++~~	
6.	07-01-25	Assay of Sodium Bicarbonate	15-16	~~A++~~	
7.	11-02-25	Assay of Calcium Carbonate	17-18	~~A++~~	
8.	18-02-25	Assay of Sodium Benzoate	19-20	~~A++~~	04/03
9.	25-02-25	Standardisation of disodium Ethylene Diamine Tetraacetic Acid	21-22	~~A++~~	
10.	25-02-25	Assay of Calcium Gluconate	23-24	~~A++~~	
11.	04-03-25	Assay of Sodium Chloride	25-27	~~A++~~	
12.	18-03-25	Assay of hydrogen peroxide	28-29	~~A++~~	
13.	25-03-25	Assay of ferrous sulphate	30-31	~~A++~~	
14.	1-04-25	Standardisation of 0.05M of Iodine solution using As_2O_3	32-33	~~A++~~	15/4
15.	08-04-25	Standardisation of Sodium Thiosulphate	34-35	~~A++~~	15/4
16.	08-04-25	Assay of Sodium Thiosulphate	36	~~A++~~	
17.	15-04-25	Assay of Copper Sulphate	37-38	~~A++~~	
18.	29-04-25	Assay of Potassium Iodide	39-40	~~A++~~	
19.	29-04-25	Gravimetric Estimation of Barium as Barium Sulphate	41-42	~~A++~~	13/5
20.	06-05-25	Preparation of Potash Alum	43	~~A++~~	
21.	13-05-25	Preparation of Magnesium Sulphate	44		
22.	03-06-25	Preparation of Boric Acid	45	~~A++~~	
23	10-06-25	Swelling Power of Bentonite	46	~~A+~~	

INDEX

S.No	Date	Name of the Experiment	Page No.	Marks	Signature
24	17-06-25	Neutralisation Capacity of $Al(OH)_3$	47-48	A† †	
25	24-06-25	Determination of mixture of sodium carbonate in sodium hydroxide	49-50	A† P	01/7
26.	01-07-25	Identification Test for Barium Sulphate	51-52	A† †	
27	08-07-25	Identification of Ferrous Sulphate	53-54	A† †	15/7
28.	15-07-25	Assay of Pottassium Chloride	55-56	A† †	
29.	22-07-25	Limit Test for Chlorides	57-58	A† †	
30.	29-07-25	Limit Test for Sulphates	59-60	A† †	
31.	05-08-25	Modified Limit Test for Chlorides and Sulphates by using $KMnO_4$	61-63	A† †	19/8
32.	12-08-25	Modified Limit test for chlorides and sulphates using Sodium Bicarbonate	64-65	A† †	
33	12-08-25	Limit Test for Iron	66-67	A† †	
34	19-08-25	Limit Test for Heavy Metals	68-70	A† †	
35.	26-08-25	Limit Test for Arsenic	71-72.	A† P	26/8

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1.6 BIOLOGY (PRACTICAL)

Practical : 3 Hrs./Week

Title:

1. Introduction of biology experiments
2. Study of cell wall constituents and cell inclusions
3. Study of Stem modifications
4. Study of Root modifications
5. Study of Leaf modifications
6. Identification of Fruits and seeds
7. Preparation of Permanent slides
8. T.S. of Senna, Cassia, Ephedra, Podophyllum.
9. Simple plant physiological experiments
10. Identification of animals
11. Detailed study of Frog
12. Computer based tutorials

Scheme of Practical Examination :

	Sessionals	**Annual**
Identification	04	10
Synopsis	04	10
Major Experiment	07	20
Minor Experiment	03	15
Viva	02	15
Max Marks	**20**	**70**
Duration	**03hrs**	**04hrs**

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

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PHARMACY COLLEGE

An AUTONOMOUS Institution

Aditya Nagar, ADB Road, Surampalem. Kakinada Dist., A.P.

Program

PHARM-D

Certified that this is the bonafide record of practical work done by

Mr./Ms. Angshuman Pramanik

with Roll No. 243G1T0005 a student of 1/6 - Pharm-D Semester

in the Biology course during the Academic Year 2024-2025

No. of Experiments Conducted 18

No. of Experiments Completed 18

Faculty incharge

Principal

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Submitted for the practical examination held on 09/09/25

Examiner -1

Examiner -2

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S.No	Date	Name of the Experiment	Page No.	Marks	Signature
1.	23/12/24	Introduction	1 to 7		
2.	30/12/24	Study of Compound Microscope	08 to 13		
3.	06/01/25	Study of cell wall constituents	14 to 21		
		And Cell Inclusions			
4.	20/01/25	Study of different modifi-	22 to 25		
		-cations of Roots			
5.	27/01/25	Study of different modifi-	26 to 29		
		-cations of Stem			
6.	03/02/25	Study of different modifi-	30 to 31		
		-cations of Leaf			
7.	10/02/25	Microscopic study of	32 to 35		
		Senna Leaf			
8.	17/02/25	Internal structure of	36 to 39		
		Dicot Root			
9.	24/02/25	Internal structure of	40 to 43		
		Monocot Root			
10.	03/03/25	Internal structure of	44 to 47		
		Dicot Stem			
11.	17/03/25	Transverse section of	48 to 50		
		A Monocot Stem			
12.	24/03/25	Microscopic study of	51 to 54		
		Cassia Cinnamon			
13.	07/04/25	Microscopic study of	55 to 57		
		Ephedra			
14.	21/04/25	Microscopic study of	58 to 59		
		Podophyllum			
15.	05/07/25	Detailed study of Frog	60 to 65		
16.	14/07/25	Preparation of Permanent	66-68		
		slide			
17.	28/07/25	Simple Plant Physiological	69-70		

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INDEX

S.No	Date	Name of the Experiment	Page No.	Marks	Signature
		Experiments			
18.	09/08/25	Computer based tutorials	71–72		

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2.5 COMMUNITY PHARMACY (THEORY)

Theory : 2 Hrs. /Week

1. **Scope**: In the changing scenario of pharmacy practice in India, Community Pharmacists are expected to offer various pharmaceutical care services. In order to meet this demand, students will be learning various skills such as dispensing of drugs, responding to minor ailments by providing suitable safe medication, patient counselling, health screening services for improved patient care in the community set up.

2. **Objectives:** Upon completion of the course, the student shall be able to –
   a. know pharmaceutical care services;
   b. know the business and professional practice management skills in community pharmacies;
   c. do patient counselling & provide health screening services to public in community pharmacy;
   d. respond to minor ailments and provide appropriate medication;
   e. show empathy and sympathy to patients; and
   f. appreciate the concept of Rational drug therapy.

   Text Books:
   a. Health Education and Community Pharmacy by N.S.Parmar.
   b. WHO consultative group report.
   c. Drug store & Business management by Mohammed Ali & Jyoti.

   Reference books:
   a. Handbook of pharmacy – health care.Edt. Robin J Harman. The Pharmaceutical press.
   b. Comprehensive Pharmacy Review – Edt. Leon Shargel. Lippincott Williams & Wilkins.

   Special requirements:
   1. Either the college is having model community pharmacy (meeting the schedule N requirement) or sign MoU with at least 4-5 community pharmacies nearby to the college for training the students on dispensing and counselling activities.
   2. Special equipments like B.P apparatus, Glucometer, Peak flow meter, and apparatus for cholesterol estimation.

3. **Scheme of evaluation (80 Marks)**

1.	Synopsis	10
2.	Major Experiment (Counselling of patients with specific diseases – emphasis should be given on Counselling introduction, content, process and conclusion)	30
3.	Minor Experiment(Ability to measure B.P/ CBG / Lung function)	15
4.	Prescription Analysis (Analyzing the prescriptions for probable drug interaction and ability to tell the management)	15
5.	Viva – Voce	10

POLYPHARMACY AND ITS IMPACT: ANALYSING DRUG RELATED PROBLEMS AMONG GERIATRICS IN A TERTIARY CARE HOSPITAL, KAKINADA.

The thesis work submitted to

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-KAKINADA

In partial fulfillment for the award of the Degree of

DOCTOR OF PHARMACY

Submitted by

KAVURU SRAVAN SAI	(203G1T0010)
PINIPE MERCY	(203G1T0013)
KOLLU ESWAR SAI KIRAN	(203G1T0023)

Under the esteemed guidance of

CLINICAL GUIDE

Dr.M. PHANI RAMANA BHUSHAN

MBBS, MD,

Director & Head of the Department of Medicine

Trust Multispeciality Hospitals

ACADEMIC GUIDE

Dr.D.SATHIS KUMAR ,

M.PHARM, P.hD.

Professor &principal

Aditya Pharmacy College (A)

DEPARTMENT OF PHARMACY PRACTICE

ADITYA PHARMACY COLLEGE (A)

Accredited by NAAC with 'A' Grade, Affiliated to JNTUK, Approved by AICTE, PCI, UGC & ISO

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April - 2025

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Aditya Nagar, ADB Road, Surampalem-533437, Andhra Pradesh, India

DECLARATION

We hereby declare that the thesis entitled **"POLYPHARMACY AND ITS IMPACT: ANALYSING DRUG RELATED PROBLEMS AMONG GERIATRICS IN A TERTIARY CARE HOSPITAL, KAKINADA"** is a bonafide project work carried out by us under the guidance of ***Dr. D. Sathis Kumar, Professor & principal, Aditya Pharmacy College (A)*** and ***Dr. M. Phani Ramana Bhushan, Director and head of the department of medicine. at Trust Multispecialty Hospitals, Kakinada,*** in partial fulfillment of the requirements for the Award of the Degree of **Doctor of Pharmacy** in the Department of Pharmacy Practice to **Jawaharlal Nehru Technological University-Kakinada (JNTU-K)**. The work embodied in this thesis is original and has not been submitted in part or in full for any degree of this or any other university.

Place: Surampalem **Date:** 21/03/2025

Kavuru Sravan Sai K. Sravan Sai

Pinipe Mercy

Kollu Eswar Sai Kiran K. E. S. Kiran

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CERTIFICATE BY THE GUIDES

This is to certify that the thesis work entitled **"POLYPHARMACY AND ITS IMPACT: ANALYSING DRUG RELATED PROBLEMS AMONG GERIATRICS IN A TERTIARY CARE HOSPITAL, KAKINADA"** is a bonafide Project work carried out by **KAVURU SRAVAN SAI (Reg. No. 203G1T0010) PINIPE MERCY (Reg. No. 203G1T0013), KOLLU ESWAR SAI KIRAN (Reg. No. 203G1T0023)**, under the guidance of us at the Department of Pharmacy Practice, Aditya Pharmacy College (A), and Dept. of Genaral Medicine, Trust Multispecialty Hospitals, Kakinada. In our opinion, this work has reached the standards in partial fulfillment of the requirement for the award of the degree of **Doctor of Pharmacy** per the regulations of the University.

Place: Surampalem & Kakinada **Date:** 21/3/2023

Trust Multispeciality Hospitals
Dr. M. PHANI RAMANA BHUSHAN
MD (Manipal)
Consultant Physician
Regd. No. 40781

Date: Time

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Dr.M. PHANI RAMANA BHUSHAN
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CERTIFICATE BY THE PRINCIPAL

This is to certify that the thesis work entitled, "**POLYPHARMACY AND ITS IMPACT: ANALYSING DRUG RELATED PROBLEMS AMONG GERIATRICS IN A TERTIARY CARE HOSPITAL, KAKINADA**" The work submitted by **KAVURU SRAVAN SAI (Reg. No. 203G1T0010), PINIPE MERCY (Reg. No. 203G1T0013), KOLLU ESWAR SAI KIRAN (Reg. No. 203G1T0023)** to **Jawaharlal Nehru Technological University, Kakinada (JNTUK)**, in partial fulfillment of the requirement for the award of the degree of **DOCTOR OF PHARMACY** in the **Department of Pharmacy Practice** under the guidance of **Dr. D. Sathis Kumar, Professor & Principal, Aditya Pharmacy College(A)** and **Dr. M. Phani Ramana Bhushan Director & Head of the Department of Medicine, Trust Multispeciality Hospitals** is the bonafide project work carried out by them at the dep of pharmacy practice, Aditya Pharmacy College (A), Surampalem & Trust Multispeciality Hospitals, Kakianda.

The results incorporated in this work have not beensubmitted to any other university or institute for the award of any degree.

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Dr. D. Sathis Kumar,
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Date : 21/03/2025

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EVALUATION CERTIFICATE

This is to certify that the thesis work entitled "**POLYPHRAMACY AND ITS IMPACT: ANALYSING DRUG RELATED PROBLEMS AMONG GERIATRICS IN A TERTIARY CARE HOSPITAL, KAKINADA**" is a bonafide Project work carried out by **KAVURU SRAVAN SAI (Reg. No. 203G1T0010) PINIPE MERCY (Reg. No. 203G1T0013), KOLLU ESWAR SAI KIRAN (Reg. No. 203G1T0023)**, submitted in partial fulfilment for the award of the degree of **DOCTOR OF PHARMACY** in the **Department of Pharmacy Practice** to **Jawaharlal Nehru Technological University, Kakinada (JNTUK).**

Place: Surampalem

Date: 21/03/2025

Internal Examiner

Sign:

External Examiner

Sign:

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CONCLUSION

This study highlights the significant impact of polypharmacy and drug-related problems (DRPs) among geriatric patients, emphasizing the need for improved medication management strategies. The study also reveals that patients with chronic conditions such as hypertension, diabetes, and renal diseases are at a higher risk of experiencing DRPs due to prolonged medication use. Moreover, DRPs were more prevalent among male patients and equally distributed between urban and rural populations, indicating the widespread nature of medication-related challenges. Implementing structured follow-ups and deprescribing strategies can help minimize the risks associated with polypharmacy and improve treatment outcomes for elderly patients. Future research should focus on long-term monitoring, multi-center studies, and intervention-based approaches to develop more effective solutions for reducing DRPs and enhancing medication safety in high-risk populations.

The pharmacovigilance system in general and elderly specific pharmacovigilance in particular is still moving at a slow pace in India. Despite the limitations of the study design, the present study raised certain novel issues in the field of geriatric pharmacovigilance, especially in hospitalized patients. Attention is warranted while instituting therapy with antibiotics, NSAIDS , diuretics or anti-hypertensives in hospitalized elderly. The avoidability of a majority of DRPs shows the need for regular consultation with a clinical pharmacologist while designing a therapeutic plan for elderly. Probably, the most relevant finding from the study was the fallibility of the widely used Naranjo algorithm for ADR causality assessment in the elderly population which makes it imperative to design newer scales for older patients. The findings may serve as the base for larger studies in the field as well as for generation of personalized treatment regimens for older hospitalized patients.

In this study, nonadherence to prescribed therapy was found to be the DRP causing hospitalization at higher incidence followed by ADR. Most commonly identified risk factors in the patients having chronic diseases are lack of knowledge about disease, need of adherence to the therapy as prescribed, and outcomes of treatment provided. Severity of DRPs was majorly assessed to be moderate.

3. Detailed syllabus and lecture wise schedule :

Title of the topic

1 Introduction to the science of microbiology. Major divisions of microbial world and Relationship among them.

2 Different methods of classification of microbes and study of Bacteria, Fungi, virus, Rickettsiae, Spirochetes.

3 Nutritional requirements, growth and cultivation of bacteria and virus. Study of different important media required for the growth of aerobic and anaerobic bacteria & fungi. Differential media, enriched media and selective media, maintenance of lab cultures.

4 Different methods used in isolation and identification of bacteria with emphasis to different staining techniques and biochemical reactions. Counting of bacteria -Total and Viable counting techniques.

5 Detailed study of different methods of sterilization including their merits and demerits. Sterilization methods for all pharmaceutical products. Detailed study of sterility testing of different pharmaceutical preparations . Brief information on Validation.

6 Disinfectants- Study of disinfectants, antiseptics, fungicidal and virucidal agents factors affecting their activation and mechanism of action. Evaluation of bactericidal, bacteristatic, , virucidal activities, evaluation of preservatives in pharmaceutical preparations.

7 Immunology- Immunity, Definition, Classification, General principles of natural immunity, Phagocytosis, acquired immunity(active and passive) . Antigens, chemical nature of antigens structure and formation of Antibodies, Antigen-Antibody reactions. Bacterial exotoxins and endotoxins. Significance of toxoids in active immunity, Immunization programme, and importance of booster dose.

8 Diagnostic tests : Schick's Test, Elisa test, Western Blot test, Southern Blot PCR Widal, QBC, Mantaux Peripheral smear. Study of malarial parasite.

9 Microbial culture sensitivity Testing: Interpretation of results Principles and methods of different microbiological assays, microbiological assay of Penicillin, Streptomycin and vitamin B_2 and B_{12}. Standardisation of vaccines and sera.

10 Study of infectious diseases: Typhoid, Tuberculosis, Malaria, Cholera, Hepatitis, Meningitis, Syphilis & Gonorrhea and HIV.

2.2 PHARMACEUTICAL MICROBIOLOGY (PRACTICAL)

Practical : 3 Hrs./Week

Title of the Experiment:

1 Study of apparatus used in experimental microbiology*.
2 Sterilisation of glass ware's. Preparation of media and sterilisation.*
3 Staining techniques – Simple staining ; Gram's staining ; Negative staining**
4 Study of motility characters*.
5 Enumeration of micro-organisms (Total and Viable)*
6 Study of the methods of isolation of pure culture.*
7 Bio chemical testing for the identification of micro*-organisms.

8 Cultural sensitivity testing for some micro-organisms.*
9 Sterility testing for powders and liquids.*
10 Determination of minimum inhibitory concentration.*
11 Microbiological assay of antibiotics by cup plate method.*
12 Microbiological assay of vitamins by Turbidometric method**
13 Determination of RWC.**
14 Diagnostic tests for some common diseases, Widal, malarial parasite.**

* Indicate minor experiment & ** indicate major experiment

Assignments:

1 Visit to some pathological laboratories & study the activities and equipment/instruments used and reporting the same.
2. Visit to milk dairies (Pasturization) and microbial laboratories(other sterization methods) & study the activities and equipment/instruments used and reporting the same.
3. Library assignments
   a. Report of recent microbial techniques developed in diagnosing some common diseases.
   b. Latest advancement developed in identifying, cultivating & handling of microorganisms.

Format of the assignment:

1. Minimum & Maximum number of pages.
2. It shall be computer draft copy.
3. Reference(s) shall be included at the end.
4. Name and signature of the student.
5. Assignment can be a combined presentation at the end of the academic year.
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	**03hrs**	**04hrs**

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

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ADB Road, Surampalem. Kakinada.Dist., (A.P.)

Department of

PHARMACEUTICAL MICROBIOLOGY

Name: P. Jyothirmai

PIN No. 233G1T0023

Certified that this is the bonafide record of practical work done by

Mr. / Ms. P. Jyothirmai Sai Satya Sri

a student of II nd- pharm-D *with Regd. No.* 233G1T0023

in the pharmaceutical Microbiology *Laboratory during the year* 2024-25

No. of Experiments Conducted 26

No. of Experiments Attended 25

Signature- Faculty incharge 04/04/25

Signature-Head of the Department

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Submitted for the practical examination held on .....

Examiner-1

Examiner-2

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Pointer

S.No.	Date	Name of the Experiment	Page No.	Remarks
1.	16.8.24	Introduction to Mibrobiology common labaratory rules.		
2.	23.8.24	Study of Apparatus and equipments used in experimental Mibrobiology.	7-14	
3.	30.8.24	preparation of Nutrient Broth.	15-16	
4.	06.9.24	preparation and Sterilization of nutrient agar.	17-19	
5.	13.9.24	Culture Transfer techniques.	20-23	
6.	20.9.24	Techniques for isolation of pure culture from mixed culture.	24-27	
7.	27.9.24	Staining techniques. preparation of Bacterial smear	28-29	
8.	04.10.24	Simple Staining.	30-31	
9.	18.10.24	Gram Staining.	32-33	
10.	25.10.24	Acid fast staining.	34-35	
11.	08.11.24	IMVIC Tests.	36-40	
12.	08.11.24	Mibroscopic examination of living bacteria by hanging drop method.	41-42	
13.	22.11.24	Sterilization by Autoclave and test for Sterility.	43-44	
14.	29.11.24	Sterilization by Dry heat and test for Sterility.	45-47	
15.	06.12.24	Test for Sterility of Surgical Dressing.	47-48	

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Pointer

S.No.	Date	Name of the Experiment	Page No.	Remarks
16.	13.12.24	Starch Hydrolysis.	49 - 50	
17.	20.12.24	Nitrate reduction test.	51 - 52	
18.	27.12.24	Vable Count.	53 - 54	
19.	03.01.25	Microbial Assay of Amikacin by Cup plate method.	55 - 56	
20.	24.01.25	Microbial Assay of tobramycin by turbidometric method.	57 - 58	
21.	24.01.25	ELISA.	59 - 61	
22.	31.01.25	Western blotting.	62 - 65	
23.	07.2.25	Widal test.	66 - 69	
24.	14.02.25	Diagnostic test for Determination of malarial parasite.	70 - 77	
25.	21.02.25	Gelatin liquefication.	78 - 79	
26.	28.02.25	Vaccines and general requirements.	80 - 81	

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2.3 PHARMACOGNOSY & PHYTOPHARMACEUTICALS (PRACTICAL)

Practical : 3 Hrs./Week

General Requirements: Laboratory Napkin, Observation Book 150 pages Zero brush, Needle, Blade, Match box.

List of experiments:

1 Introduction of Pharmacognosy laboratory and experiments.
2 Study of cell wall constituents and cell inclusions.
3 Macro, powder and microscopic study of Datura.
4 Macro, powder and microscopic study of Senna.
5 Macro, powder and microscopic study of Cassia.cinnamon.
6 Macro, powder and microscopic study of Cinchona.
7 Macro, powder and microscopic study of Ephedra.
8 Macro, powder and microscopic study of Quassia.
9 Macro, powder and microscopic study of Clove
10 Macro, powder and microscopic study of Fennel.
11 Macro, powder and microscopic study of Coriander.
12 Macro, powder and microscopic study of Isapgol.
13 Macro, powder and microscopic study of Nux vomica.
14 Macro, powder and microscopic study of Rauwolfia.
15 Macro, powder and microscopic study of Liquorice.
16 Macro, powder and microscopic study of Ginger.
17 Macro, powder and microscopic study of Podophyllum.
18 Determination of Iodine value.
19 Determination of Saponification value and unsaponifiable matter.
20 Determination of ester value.
21 Determination of Acid value.
22 Chemical tests for Acacia.
23 Chemical tests for Tragacanth.
24 Chemical tests for Agar.
25 Chemical tests for Starch.
26 Chemical tests for Lipids.(castor oil,sesame oil, shark liver oil,bees wax)
27 Chemical tests for Gelatin.

Scheme of Practical Examination:

	Sessionals	**Annual**
Identification	04	10
Synopsis	04	10
Major Experiment	07	20
Minor Experiment	03	15
Viva	02	15
Max Marks	**20**	**70**
Duration	**03hrs**	**04hrs**

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Department of

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Name: B: Raja Rajeswari PIN No. 233G1T0005

Certified that this is the bonafide record of practical work done by

Mr./Ms. B: Raja Rajeswari

a student of Pharm-D II *with Regd. No.* 233G1T0005

in the Pharmacognosy *Laboratory during the year* 2024-25

No. of Experiments Conducted 24 No. of Experiments Attended 22

Signature - Faculty incharge

Signature-Head of the Department

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Submitted for the practical examination held on 2-5-2025

Examiner-1

Examiner-2

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Pointer

S.No.	Date	Name of the Experiment	Page No.	Remarks
1.	28.08.24	Study of compound Microscope	1-4	
2.	04.09.24	Macroscopy, Microscopy and powdered microscopy of fennel	5-8	
3	11.09.24	Macroscopy, Microscopy and powdered microscopy of clove	9-12	
4	18.09.24	Macroscopy, Microscopy and powdered microscopy of Cinnamon	13-16	
5.	25.09.24	Macroscopy, Microscopy and powdered microscopy of study of Datura	17-20	
6.	16.10.24	Macroscopy, Microscopy and powdered microscopic study of senna	21-24	
7.	23.10.24	Macroscopy, Microscopy and powdered microscopic study of Ephedra	25-26	
8.	13.11.24	Macroscopy, Microscopy and powdered Microscopic study of Quassia.	27-29	
9.	20.11.24	Macroscopy, Microscopy and powdered Microscopic study of Nux-vomica	30-32	
10.	27.11.24	Macroscopy, Microscopy and powdered Microscopic study of coriander	33-35	
11.	4.12.24	Macroscopy, Microscopy and powdered Microscopic study of Isapgol	36-38	
12	11.12.24	Macroscopy, Microscopy and powdered Microscopic study of cinchona	39-42	
13.	18.12.24	Macroscopic, Microscopy and powdered Microscopic study of Rauwolfia	43-45	
14	08.01.25	Macroscopic, Microscopy and powdered Microscopic study of Liquorice	46-49	

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Pointer

S.No.	Date	Name of the Experiment	Page No.	Remarks
15.	22.01.25	Macroscopy, Microscopy and powdered microscopic study of Ginger	50-53	
16.	29.01.25	Macroscopy, Microscopy and powdered microscopic study of podophyllum.	54-56	
17.	12.02.25	Determination of saponification value and ester value of coconut oil	57-58	
18.	19.02.25	Determination of Acid value of coconut oil.	59-60	
19.	05.03.25	chemical test for starch	61-62	
20.	12.03.25	chemical test for Acacia	63-64	
21.	19.03.25	chemical test for Tragacanth	65-66	
22.	26.03.25	chemical test for Agar	67-68	
23	2.04.25	Chemical test for Gelatin	69-70	
24.	09.04.25	Chemical test for lipids	71-72	

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

Etiopathogenesis and pharmacotherapy of diseases associated with following systems/ diseases

Title of the topic

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

2 **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 **General prescribing guidelines for**
a. Paediatric patients
b. Geriatric patients
c. Pregnancy and breast feeding

4 **Ophthalmology:** Glaucoma, Conjunctivitis- viral & bacterial

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

2.6 PHARMACOTHERAPEUTICS - I (PRACTICAL)

Practical : 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	**03hrs**	**04hrs**

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

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ENLIGHTENS THE NESCIENCE

ADITYA
PHARMACY COLLEGE

ADB Road, Surampalem. Kakinada.Dist., (A.P.)

Department of

Pharmacotherapeutics-1

Name: P. Veda Ankitha

PIN No. 2 3 3 G 1 T 0 0 2 2

Certified that this is the bonafide record of practical work done by

Mr./Ms. Pepakayala Veda Ankitha

a student of II Pharm.D *with Regd. No.* 233G1T0022

in the Pharmacotherapeutics *Laboratory during the year* 2024-2025.

No. of Experiments Conducted 20

No. of Experiments Attended 19

Signature - Faculty incharge

Signature-Head of the Department

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SURAMPALEM-533 437

Submitted for the practical examination held on 03.05.2025

Examiner-1

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Examiner-2

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Pointer

S.No.	Date	Name of the Experiment	Page No.	Remarks
1.	24-8-24	INTRODUCTION TO SOAP FORMAT.	01-03	
2.	31-8-24	RENAL CALCULI WITH HYPERTE -NSION & DIABETIC MELLITUS.	04-11	
3.	14-9-24	NEPHROTIC SYNDROME.	12-19	
4.	21-9-24	CEREBRAL PALSY WITH REFRAC -TORY SEIZURES.	20-24	
5.	28-9-24	POLYARTHRITIS.	25-31	
6.	5-10-24	THALASSEMIA	32-35	
7.	19-10-24	BRONCHILITIS AND RESPIRATORY DISTRESS.	36-40	
8.	26-10-24	JUVENILE RHEUMATOID ARTHRITIS.	41-45	
9.	30-11-24	FACIAL NERVE PALSY.	46-53	
10.	21-12-24	COLLOID GOITRE.	54-60	
11.	28-12-24	PNEUMONIA.	61-67	
	4-01-25	CEREBRO VASCULAR ACCIDENT	68-74	

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Pointer

S.No.	Date	Name of the Experiment	Page No.	Remarks
12	15.2.25	PULMONARY TUBERCULOSIS	01-11	
13.	22.3.25	FALCIPARUM - MALARIA	12-17	
14.	01-3.25	DIABETIC KETOACIDOSIS WITH THE SEIZURES.	18-23	
15.	8.03.25	TOXIC EPIDERMAL NECROLYSIS	24-30	
16.	15.3.25	CHOLELITHIASIS	31-38	
17.	22.3.25	ANTEROSEPTAL MYOCARDIAL INFRACTION	39-45	
18	29.3.25	THALAMIC BLEED	46-54	
19	12.4.25	CHRONIC CALCIFIC PANCREATITIS	55-62	
20.	19.4.25	HEPATITIS	63-70	

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3.3 PHARMACOTHERAPEUTICS – II (THEORY)

Theory : 3 Hrs. /Week

1. **Scope of the Subject:** 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 of the Subject Upon completion of the subject student shall be able to –**
   a. know the pathophysiology of selected disease states and the rationale for drug therapy
   b. know the therapeutic approach to management of these diseases;
   c. know the controversies in drug therapy;
   d. know the importance of preparation of individualised therapeutic plans based on diagnosis; and
   e. appreciate the 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).

   Text books (Theory)
   Clinical Pharmacy and Therapeutics - Roger and Walker, Churchill Livingstone publication

   Reference books (Theory)
   a. Pharmacotherapy: A Pathophysiologic approach - Joseph T. Dipiro et al. Appleton & Lange
   b. Clinical Pharmacy and Therapeutics - Eric T. Herfindal, Williams and Wilkins Publication
   c. Applied Therapeutics: The clinical Use of Drugs. Lloyd Young and Koda-Kimble MA]

3. **Detailed syllabus and lecture wise schedule :**
   Etiopathogenesis and pharmacotherapy of diseases associated with following systems / diseases –

   Title of the topic

   1. **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
   2 **Musculoskeletal disorders**
   Rheumatoid arthritis, Osteoarthritis, Gout, Spondylitis, Systemic lupus erythematosus.
   3 **Renal system**
   Acute Renal Failure, Chronic Renal Failure, Renal Dialysis, Drug induced renal disorders

COMPARATIVE STUDY OF DISEASEPROGRESSION TREATMENT OUTCOMES, QUALITY OF LIFE & DIFFERENT SUBTYPES SEROPOSITIVE & SERONEGATIVE OF RHEUMATOID ARTHRITIS PATIENTS

The thesis Work Submitted to

JAWAHARLALNEHRUTECHNOLOGICALUNIVERSITY-KAKINADA

In partial fulfillment of the requirements for the award of the Degree of

DOCTOR OF PHARMACY

Submitted by

ACHANTA LOKESH (203G1T0001)

BUDATI MOUNIKA (203G1T0003)

RAMBUDDI PRIYANKA (203G1T0017)

Under the Esteemed Guidance of

CLINICAL GUIDE

Dr.P.SURYA PRAKASH

MBBS,MD,DM

Consultant Orthopedic&Joint Replacement Surgeon

Trust Multi Speciality Hospitals, Kakinada

INSTITUTIONAL GUIDE

Dr.P.S.V.M. DEEPIKA

AssistantProfessor

Aditya Pharmacy College(A),Surampalem

Trust Multispeciality Hospitals
Dr. P. SURYA PRAKASH NAIDU
MS(ORTHO), FUS (COIMBATORE), FOAI
Consultant Orthopaedic & Joint Replacement Surgeon
Regd. No. 109387
Date: Time :

DEPARTMENT OF PHARMACY PRACTICE

ADITYA PHARMACY COLLEGE(A)

Accredited by NAAC with 'A' Grade, Affillated to JNTUK, Approved by AICTE, PCI, UGC &ISO
AdityaNagar, ADBRoad,Surampalem-533437, Andhra Pradesh,India
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ACADEMIC YEAR 2024-2025

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Approved by AICTE, PCI, UGC & ISO
AdityaNagar,ADBRoad,Surampalem-533437,AndhraPradesh,India

DECLARATION

We hereby declare that the thesis entitled"COMPARATIVE STUDY OF DISEASE PROGRESSION TREATMENT OUTCOMES, QUALITY OF LIFE & DIFFERENT SUBTYPES SEROPOSITIVE & SERONEGATIVE OF RHEUMATOID ARTHRITIS PATIENTS" is a bonafide project work carried out by us under the guidance of **Dr. P.S.V.M.Deepika, Assistant Professor, Department of Pharmacy Practice at Aditya Pharmacy College (A)**and **Dr.P.Surya Prakash Naidu, Senior Consultant Orthopedic & Joint Replacement Surgeon Trust Multispecialty Hospitals, Kakinada,** in partial fulfillment of the requirements for the Award of the Degree of **Doctor of Pharmacy** in the Department of Pharmacy Practice to **Jawaharlal Nehru Technological University-Kakinada(JNTU-K)**. The work embodied in this thesis is original and has not been submitted in part or whole for any degree of this or any other university.

Place: Surampalem **Date:** 20/3/25

ACHANTA LOKESH ----A. Lokesh----

BUDATI MOUNIKA ----B. Mounika----

RAMBUDDI PRIYANKA ----R. Priyanka----

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Approved by AICTE, PCI, UGC & ISO
AdityaNagar,ADBRoad,Surampalem-533437,AndhraPradesh,India

CERTIFICATE BY THE GUIDES

This is to certify that the thesis work entitled "COMPARATIVE STUDY OF DISEASE PROGRESSION TREATMENT OUTCOMES, QUALITY OF LIFE & DIFFERENT SUBTYPES SEROPOSITIVE & SERONEGATIVE OF RHEUMATOID ARTHRITIS PATIENTS" is a bonafide Project work carried out by **ACHANTALOKESH(Reg.No.203G1T0001),BUDATIMOUNIKA(Reg.No.203G1T0003), RAMBUDDI PRIYANKA(Reg.No.203G1T0017)** under the guidance of us at the Department of Pharmacy Practice, Aditya Pharmacy College (A), in collaboration with Dept. of **Orthopedics, Trust MultispecialtyHospitals, Kakinada.** In our opinion, this work has reached the standards in fulfillment of the partial requirement for the award of the degree of **Doctor of Pharmacy** per the regulations of the University.

Place: Surampalem & Kakinada

Date: 20/3/25

Trust Multispeciality Hospitals
Dr. P. SURYA PRAKASH NAIDU
MS (ORTHO), FIJR (COIMBATORE), FOAI
Consultant Orthopaedic & Joint Replacement Surgeon
Regd. No. 093697

CLINICAL GUIDE

Date: Time :

Dr. P.SURYA PRAKASH NAIDU
MBBS, MD, DM
Consultant Orthopedic & Joint Replacement Surgeon
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INSTITUTIONAL GUIDE

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Assistant Professor
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AdityaNagar,ADBRoad,Surampalem-533437,AndhraPradesh,India

CERTIFICATE BY THE PRINCIPAL

This is to certify that the thesis work entitled, "COMPARATIVE STUDY OF DISEASE PROGRESSION TREATMENT OUTCOMES, QUALITY OF LIFE & DIFFERENT SUBTYPES SEROPOSITIVE & SERONEGATIVE OF RHEUMATOID ARTHRITIS PATIENTS" submitted by **LOKESH ACHANTA(Reg.No.203G1T0001), BUDATI MOUNIKA(Reg.No.203G1T0003), RAMBUDDI PRIYANKA(Reg.No.203G1T0017)** to **Jawaharlal Nehru Technological University, Kakinada** (JNTUK), to Jawaharlal Nehru Technological University, Kakinada (JNTUK), in partial fulfillment for the award of the degree of DOCTOR OF PHARMACY in the Department of Pharmacy Practice under the guidance of Dr. D. Sathis Kumar, M. Pharm., Ph. D., Professor & Principal, is the bonafide project work carried out by them at Aditya Pharmacy College (A), Surampalem & Trust Multispeciality Hospitals, Kakianda.The results incorporated in this work have not been submitted to any other university or institute for the award of any degree.

Place:Surampalem
Date: 20/3/25

Dr.D.SathisKumar,
M.Pharm,Ph.D.
Principal,
Aditya Pharmacy College(A),
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AdityaNagar,ADBRoad,Surampalem-533437,AndhraPradesh, India

EVALUATION CERTIFICATE

This is to certify that the thesis work entitled, "COMPARATIVE STUDY OF DISEASE PROGRESSION TREATMENT OUTCOMES, QUALITY OF LIFE & DIFFERENT SUBTYPES SEROPOSITIVE & SERONEGATIVE OF RHEUMATOID ARTHRITIS PATIENTS" is a bonafide Project work done by **ACHANTA LOKESH(Reg.No.203G1T0001), BUDATI MOUNIKA (Reg.No.203G1T0003), RAMBUDDI PRIYANKA(Reg.No.203G1T0017)** submitted in partial fulfillment for the award of the degree of DOCTOR OF PHARMACY in the Department of Pharmacy Practice to Jawaharlal Nehru Technological University, Kakinada (JNTUK).

Place:Surampalem

Date: 20/3/25

20/3/25

Internal Examiner Signature

External Examiner Signature

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INSTITUTIONAL ETHICAL COMMITTEE (IEC)
ADITYA PHARMACY COLLEGE (A)

Approved by PCI, New Delhi; Accredited by NAAC "A" Grade;
Permanently affiliated to JNTU-Kakinada
Aditya Nagar, ADB Road, Surampalem-533437, Kakinada District

CERTIFICATE OF ETHICAL APPROVAL

Certificate Reference Number: APC-IEC/Pharm. D/2024-25/01

Academic Project Title:
Comparative Study of Disease Progression, Treatment Outcomes, Quality of Life, and Different Subtypes of Seropositive and Seronegative Rheumatoid Arthritis Patients.

Principal Investigators:

1. **Academic Guide: Dr. P. V. M. Deepika,** Assistant Professor, Dept. of Pharmacy Practice, Aditya Pharmacy College (A), Surampalem.
2. **Clinical Guide: Dr. P. Surya Prakash Naidu,** Orthopedic Surgeon at Trust Multispeciality Hospitals. Kakinada.

Co-Investigators (V/VI Pharm. D Students):

1. **Achanta Lokesh (Reg. No. 203G1T0001)**
2. **Budati Mounika (Reg. No. 203G1T0003)**
3. **Rambuddi Priyanka (Reg. No. 203G1T0017)**

Approval Details:
The Institutional Ethics Committee (IEC) reviewed and discussed the proposal to conduct a research study entitled **"Comparative Study of Disease Progression, Treatment Outcomes, Quality of Life, and Different Subtypes of Seropositive and Seronegative Rheumatoid Arthritis Patients"** during its meeting on **23-09-2024** at the Board Room, Aditya Pharmacy College (A), Surampalem.

After thorough deliberations, the Committee grants ethical approval for this **Observational study, which is approved for six (6) months,** subject to adherence to the study protocol and Institutional guidelines.

Ethical Considerations:

- ✓ The study **mustn't involve the collection of Blood/Specimen samples** or **any intervention in the Patient treatment plans,** as it is a purely **Observational** study.
- ✓ **Any changes in the Study Protocol, Informed Consent, or Study Parameters** must be reported to the IEC.
- ✓ The IEC reserves the right to **review the study data** at any stage and **withdraw approval** if ethical concerns arise.

Declaration of Compliance:
The Principal Investigator and Co-Investigators affirm that this study will be conducted in **full compliance** with:

- **Institutional Ethics Committee (IEC) Guidelines.**
- **The Declaration of Helsinki (2013) Ethical Principles.**
- **Good Clinical Practice (GCP) and ICMR Guidelines for Biomedical Research (2023).**

The Institutional Ethics Committee wishes you all the best in your research.

ADITYA PHARMACY COLLEGE (A) IEC SURAMPALEM

24/9/24

Dr. D. Sathis Kumar
Member-Secretary
Institutional Ethical Committee
Aditya Pharmacy College (A), Surampalem

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9) CONCLUSION

Our study highlights the significant differences between Seropositive and Seronegative rheumatoid arthritis (RA) patients in terms of disease progression, treatment outcomes, and quality of life. Seropositive RA patients experience higher pain severity, longer disease duration, and poorer quality of life compared to their Seronegative counterparts. Additionally, they require more aggressive treatment, including increased use of disease-modifying antirheumatic drugs (DMARDs), non-steroidal anti-inflammatory drugs (NSAIDs), and corticosteroids. A notable finding was the significant association between gender and serological status, with females being more likely to have Seropositive RA. Interestingly, despite RA having a genetic component, no statistically significant link was found between family history and Seropositivity, suggesting that environmental and lifestyle factors also play a crucial role in disease development.

The study further established a strong correlation between pain severity and quality of life, where seropositive RA patients reported significantly higher pain levels and lower overall well-being. Additionally, while seropositive patients required more intensive treatment regimens, their response to therapy varied widely, emphasizing the need for personalized treatment approaches, including biologic DMARDs, for better disease control. These findings underscore the importance of early diagnosis and individualized therapeutic strategies to mitigate disease progression and improve patient outcomes. Future research should focus on identifying predictive biomarkers, exploring lifestyle interventions, and optimizing treatment protocols to enhance long-term disease management and overall quality of life for RA patients.

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3.1 PHARMACOLOGY – II (PRACTICAL)

Practical : 3 Hrs./Week

List of Experiments:

1. Study of laboratory animals and their handling (a. Frogs, b. Mice, c. Rats, d. Guinea pigs, e. Rabbits).
2. Study of physiological salt solutions used in experimental pharmacology.
3. Study of laboratory appliances used in experimental pharmacology.
4. Study of use of anesthetics in laboratory animals.
5. To record the dose response curve of Ach using isolated ileum/rectus abdominis muscle preparation.
6. To carry out bioassay of Ach using isolated ileum/rectus abdominis muscle preparation by interpolation method.
7. To carry out bioassay of Ach using isolated ileum/rectus abdominis muscle preparation by three point method.
8. To record the dose response curve of Histamine using isolated guinea-pig ileum preparation.
9. Study of agonistic and antagonistic effects of drugs using isolated guinea-pig ileum preparation.
10. To carry out bioassay of Histamine using isolated guinea-pig ileum preparation by interpolation method.
11. To carry out bioassay of Histamine using guinea-pig ileum preparation by three point method.
12. To study the routes of administration of drugs in animals (Rats, Mice, Rabbits).
13. Study of theory, principle, procedure involved and interpretation of given results for the following experiments:
    a) Analgesic property of drug using analgesiometer.
    b) Antiinflammatory effect of drugs using rat-paw edema method.
    c) Anticonvulsant activity of drugs using maximal electroshock and pentylene tetrazole methods.
    d) Antidepressant activity of drugs using pole climbing apparatus and pentobarbitone induced sleeping time methods.
    e) Locomotor activity evaluation of drugs using actophotometer and rotorod.
    f) Cardiotonic activity of drugs using isolated frog heart and mammalian heart preparations.

Scheme of Practical Examination:

	Sessionals	**Annual**
Identification	02	10
Synopsis	04	10
Major Experiment (Bioassay)	08	30
Minor Experiment (Interpretation of given Graph or simulated experiment)	04	10
Viva	02	10
Max Marks	**20**	**70**
Duration	**3hrs**	**4hrs**

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

ADITYA
PHARMACY COLLEGE

ADB Road, Surampalem. Kakinada.Dist., (A.P.)

Department of

PHARMACOLOGY-II

Name: G.VARSHASRI PIN No. 223G1T0014

Certified that this is the bonafide record of practical work done by

Mr./Ms. G.VARSHASRI

a student of III PHARM.D *with Regd. No.* 223G1T0014

in the PHARMACOLOGY-II *Laboratory during the year* 2024-25

No. of Experiments Conducted 21

No. of Experiments Attended 21

11.04.25

Signature - Faculty incharge

PRINCIPAL

Signature-Head of the Department

ADITYA PHARMACY COLLEGE
SURAMPALEM-533 437

Submitted for the practical examination held on 19-04-2025

N. Bankeerthana
Examiner-1

Examiner-2

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Pointer

S.No.	Date	Name of the Experiment	Page No.	Remarks
1.	13/7/24	Introduction	01	
2.1.	20/7/24	Study of Laboratory Animals and their Handling.	02.	PS
2.	10/8/24	Study of Physiological salt solution used in the Pharmacological Experiments	07	
3.	17/8/24	Study of Appliances used in Experimental Pharmacology.	09	
4.	24/8/24	Study of use of Anaesthetics in Laboratory animals.	12.	
5.	14/9/24	Dose response curve of Acetylcholine on Frog Rectus Abdominus muscle preparation.	16.	
6.	21/9/24	Inhibition of Acetylcholine by Lidocaine on ileum of the chick.	18	
7.	15/10/24	Potentiation of Acetylcholine by neostigmine on the chick ileum	20	
8.	26/10/24	Bioassay of Acetylcholine by using chick ileum by Matching method.	22.	
9.	9/11/24	Bioassay of Acetylcholine by Interpolation method using chick ileum preparation.	24.	
10.	30/11/24	Bioassay of Acetylcholine by Two point method using the Frog rectus Abdominal muscle preparation.	27.	
11.	7/12/24	Three point Bio-assay of Acetylcholine on Frog Rectus Abdominus muscle	29.	
12.	14/12/24	Evaluation of Muscle Relaxant Property of Diazepam using Rotard Apparatus	33	
13.	18/12/24	Evaluation of CNS Depressant activity & chlorophromazine using Actophotometer	35	

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Pointer

S.No.	Date	Name of the Experiment	Page No.	Remarks
14.	21/12/24	Analgesic effect of Pentazocine on mice using eddy's hot plate method.	37.	
15.	4/1/25	Anti-inflammatory effect using Rat paw edema method.	39	
16.	25/1/25	Anti-convulsant activity of phenytoin against maximal electro shock induced convulsions.	42.	
17.	15/2/25	Anti-convulsant activity of Diazepam against pentylene tetrazoline induced chronic convulsions.	45.	
18.	22/2/25	Study of Different route of Drug Administration.	47	
19.	8/3/25	complete inhibition of Ach Response by Pancuronium on chick ileum	50	
20.	15/3/25	cardiotonic activity of Drugs using Isolated Frog Heart Preparation.	52.	
21.	22/3/25	Potentiation of Acetylcholine by neostigmine on Frog rectus abdominus muscle.	55.	

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- **Fluorimetric Analysis:** Theory, luminescence, factors affecting fluorescence, quenching. Instrumentation, Applications, fluorescent indicators, study of pharmaceutically important compounds estimated by fluorimetry.

b. **Flame Photometry:** Theory, nebulisation, flame and flame temperature, interferences, flame spectrometric techniques and instrumentation and pharmaceutical applications.

c. **Atomic Absorption Spectrometry:** Introduction, Theory, types of electrodes, instrumentation and applications.

d. **Atomic Emission Spectroscopy**: Spectroscopic sources, atomic emission spectrometers, photographic and photoelectric detection.

e. **NMR & ESR (introduction only):** Introduction, theoretical aspects and applications.

f. **Mass Spectroscopy**: (**Introduction only**) – Fragmentation, types of ions produced mass spectrum and applications.

g. **Polarimetry: (Introduction only)** – Introduction to optical rotatory dispersion, circular dichroism, polarimeter.

h. **X-RAY Diffraction: (Introduction only)** – Theory, reciprocal lattice concept, diffraction patterns and applications.

i. **Thermal Analysis**: Introduction, instrumentation, applications, and DSC and DTA.

3.2 PHARMACEUTICAL ANALYSIS (PRACTICAL)

Practical : 3 Hrs./Week

List of Experiments:

1. Separation and identification of Amino Acids by Paper Chromatography.
2. Separation and identification of Sulpha drugs by TLC technique.
3. Effect of pH and solvent on the UV spectrum of given compound.
4. Comparison of the UV spectrum of a compound with that of its derivatives.
5. Determination of dissociation constant of indicators using UV-Visible spectroscopy.
6. Conductometric titration of mixture of acids with a strong base.
7. Potentiometric titration of a acid with a strong base.
8. Estimation of drugs by Fluorimetric technique.
9. Study of quenching effect in fluorimetry.
10. Colourimetric estimation of Supha drugs using BMR reagent.

11. Simultaneous estimation of two drugs present in given formulation.
12. Assay of Salicylic Acid by colourimetry.
13. Determination of Chlorides and Sulphates in Calcium gluconate by Nepheloturbidimetric Method.
14. Determination of Na/K by Flame Photometry.
15. Determination of pKa using pH meter.
16. Determination of specific rotation.
17. Comparison of the IR spectrum of a compound with that of its derivatives.
18. Demonstration of HPLC.
19. Demonstration of HPTLC.
20. Demonstration of GC-MS.
21. Demonstration of DSC.
22. Interpretation of NMR spectra of any one compound.

Reference Books:

1. Text Book of Pharm. Analysis by Higuchi. T and Hasen. E. B., New York Inter Science Publishers.
2. Quantitative Pharma. Analysis by Jenkins, The Blakiston division, New York.
3. Quantitative Drug Analysis, by Garrot. D, Chapman & Hall Ltd., London.
4. Undergraduate Instrumental Analysis by James. E., CBS Publishers.
5. Instrumental Analysis by Willard and Merritt, EWP, East West Press Ltd., Delhi/Madras.
6. Pharm Analysis by Skoog and West, . Sounders Manipal College Publishing.
7. Text Book of Chemical Analysis, by A.I.Vogel, ELBS with Macmillan press, Hampshire.
8. Textbook of Pharm. Analysis by K.A.Connors, John Wiley & Sons, New York, Brisbane, Singapore.
9. Textbook of Pharm. Analysis (Practical) by Beckett & Stenlake, CBS Publishers, Delhi.
10. Textbook of Drug Analysis by P.D. Sethi., CBS Publishers, Delhi.
11. Spectroscopy by Silverstein, John & Wiley & Sons. Inc., Canada & Singapore.
12. How to practise GMP-A Plan for total quality control by P.P. Sharma, Vandana Publications, Agra.
13. The Science & Practice of Pharmacy by Remington Vol-I & II, Mack Publishing Co. Pennsylvania.
14. TLC by Stahl, Spring Verlay.
15. Text Book of Pharm. Chemistry by Chatten, CBS Publications.
16. Spectroscopy by William Kemp, ELBS with Macmillan Press, Hampshire.
17. I.P.-1996, The Controller of Publications, New Delhi.
18. BPC- Dept. of Health, U.K. for HMSO.
19. USP - Mack Publishing Co., Easton, PA.
20. The Extra Pharmacopoeia – The Pharm. Press, London.

ADITYA
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ADB Road, Surampalem. Kakinada.Dist., (A.P.)

Department of

PHARMACEUTICAL ANALYSIS

Name: K.BHAGYASRI PIN No. 2 2 3 G 1 T 0 0 1 6

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Mr. / Ms. K.BHAGYASRI

a student of II PHARM-D *with Regd. No.* 2236 1T0016

in the PHARMACEUTICAL ANALYSIS *Laboratory during the year* 2024-25

No. of Experiments Conducted 32 No. of Experiments Attended 32

B. Sujith 15/03/2025

Signature - Faculty incharge

Signature-Head of the Department

Submitted for the practical examination held on 11-04-25

11/4/25

Examiner-1

11/4/25

Examiner-2

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

5 **Dermatology:** Psoriasis, Scabies, Eczema, Impetigo

3.3 PHARMACOTHERAPEUTICS – II (PRACTICAL)

Practical : 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.

The student shall be trained to understand the principle and practice involved in selection of drug therapy including clinical discussion.

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	**03hrs**	**04hrs**

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

PHARMACOTHERAPEUTICS-II

PRACTICAL RECORD

Submitted

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-KAKINADA

In Partial Fulfilment of the Regulations for the award of the degree of

DOCTOR OF PHARMACY

Submitted by

Mr. Bachala Charan Teja

Reg. No. 223G1T0004

III/VI Pharm. D

DEPARTMENT OF PHARMACY PRACTICE

ADITYA PHARMACY COLLEGE (A)

Accredited by NAAC with 'A' Grade, Affiliated to JNTUK, Approved by AICTE, PCI, UGC & ISO

Aditya Nagar, ADB Road, Surampalem-533437, Andhra Pradesh, India

Email: , Web:

APRIL 2025

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Aditya Pharmacy College
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ADITYA PHARMACY COLLEGE (A)

Accredited by NAAC with 'A' Grade, Affiliated to JNTUK
Approved by AICTE, PCI, UGC & ISO
Aditya Nagar, ADB Road, Surampalem-533437, Andhra Pradesh, India

CERTIFICATE

This is to certify that the Practical Record of Pharmacotherapeutics-II, comprising twenty (20) documented case studies, has been satisfactorily completed and submitted by Mr. Bachala Charan Teja, bearing Reg. No. 223G1T0004, III/VI Pharm. D Student, under the supervision of Dr. Pavan Kumar Yanamadala, Assistant Professor, at the Department of Pharmacy Practice, Aditya Pharmacy College (A) during the Academic Year of 2024-2025 in partial fulfillment of the academic requirements for the award of the degree of DOCTOR OF PHARMACY, as specified by the Jawaharlal Nehru Technological University, Kakinada, Andhra Pradesh.

Dr. J.B. Narendra
Dr. ~~Pavan Kumar Yanamadala~~
Assistant Professor
Dept. of Pharmacy Practice

Dr. D. Sathis Kumar
M. Pharm., Ph. D.
Professor & Principal
Aditya Pharmacy College
SURAMPALEM-533 437

Place: Surampalem

10/04/25
Date of the Examination:

Internal Examiner

External Examiner 10.4.25

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INDEX

S. No.	Date Collected	Title of the Case	Page No.	Signature of the Staff
1	25-11-24	Case study on COPD		
2	2-12-24	Case Study on chronic liverdisease		
3	9-12-24	Case Study on Cellulitis		
4	16-12-24	Case study on ulcerative calitis		
5	6-1-25	Case Study on Kidney disease T HTN		
6	20-1-25	Case study on CKD T UTI		
7	27-1-25	Case study on AWSTEMI		
8	3-2-25	Case study on Dilated Cardiomyopathy		
9	10-2-25	Case Study on Pancytopenia		
10	17-2-25	Case Study on Severe Acute Pancreatis		
11	19-2-25	Case Study on Bronchial Asthma		
12	24-2-25	Case Study On IBD		
13	3-3-25	Case Study on Aortic Aneurysm		
14	5-3-25	Case Study on CAD - AWMI		
15	10-3-25	Case Study on Acute Severe Gastritis		
16	12-3-25	Case Study on Ischemic Cardic Myopthy		
17	17-3-25	Case Study on Severe LVD		
18	19-3-25	Case Study on Acute gastro entritis		
19	24-3-25	Case Study on Paroxysmal Dyspenia		
20	26-3-25	Case Study on interstital pancreatitis		

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3.5 MEDICINAL CHEMISTRY (PRACTICAL)

Practical : 3 Hrs./Week

1. Assays of important drugs from the course content.
2. Preparation of medicinally important compounds or intermediates required for synthesis of drugs.
3. Monograph analysis of important drugs.
4. Determination of partition coefficients, dissociation constants and molar refractivity of compounds for QSAR analysis.

Reference Books:

a. Wilson and Gisvold's Text book of Organic, Medicinal and Pharmaceutical Chemistry, Lippincott-Raven Publishers-New York, Philadelphia.

b. William.O.Foye, Principles of Medicinal Chemistry, B.I. Waverly Pvt. Ltd., New Delhi.

c. Burgers, Medicinal Chemistry, M.E.,Welly Med.Chemistry M.E. Walffed Johnwilley and Sons, Wiley-interscience Publication, New York, Toranto.

d. A Text Book of Medicinal Chemistry Vol. I and II by Surendra N. Pandeya, S.G. Publisher, 6, Dildayal Nagar, Varanasi -10.

e. Indian Pharmacopoeia 1985 and 1996. The Controller of Publications, Civil Lines, Delhi - 54.

f. Current Index of Medical Specialities (CIMS) and MIMS India, MIMS, A.E. Morgan Publications (I) Pvt. Ltd, New Delhi-19.

g. Organic Drug Synthesis-Ledniser Mitzsher Vol. I and II.

h. Pharmaceutical Chemistry drug Synthesis Vol. I and II by H. J. Roth and A. Kleemann.

i. The Science and Practice of Pharmacy Vol. 1 and 2, Remington, MACK Publishing Company, Easton, Pennsylvania.

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Department of

Medicinal Chemistry.

Name: Sneha Latha. PIN No. 223G1T0008

Certified that this is the bonafide record of practical work done by

Mr./Ms. Chinthala Sneha Latha.

a student of 3rd pharmD *with Regd. No.* 223G1T0008

in the Medicinal Chemistry. *Laboratory during the year* 2024-2025

No. of Experiments Conducted 22 No. of Experiments Attended 20

Signature - Faculty incharge

Signature-Head of the Department

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Submitted for the practical examination held on 10/4/25

Examiner-1 10/4/25

Examiner-2

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223G1T0008

Pointer

S.No.	Date	Name of the Experiment	Page No.	Remarks
1.	16/7/24	Preparation of Benzocaine	1-2	
2.	23/7/24	Preparation of 7-Hydroxy 4-Methyl coumarin	3-4	
3.	30/7/24	preparation of Benzimadazole	5-6	
4.	6/8/24	preparation of Benzotriazole	7-8	
5.	13/8/24	preparation of Fluorescein	9-10	
6.	20/8/24	Preparation of 5,5 diphenyl Hydantoin	11-12	
7.	27/8/24	preparation of 2,3 diphenyl Quinoxaline from OPD	13	
8.	3/9/24	preparation of Benzilic acid from Benzoin.	14-15	
9.	10/9/24	Assay of Ascorbic acid	16-17	
10.	1/10/24	Assay of Benzocaine	18-19	
11	22/10/24	Assay of Sulphanilamide	20-21	
12.	29/10/24	Assay of Diclofenac Sodium	22	
13.	12/11/24	Assay of Metronidazole	23-24	
14.	19/11/24	Assay of Isoniazid	25-26	
15.	26/11/24	Assay of Dapsone	27-28	
16.	3/12/24	Assay of chloroquine phosphate	29-30	
17.	10/12/24	Identification of Ascorbic acid	31-32	
18.	17/12/24	Identification of Sulphanilamide	33	
19.	21/1/25	Identification of Benzocaine	34	
20.	28/1/25	Identification of Isoniazid	35	
21.	4/2/25	Identification of Metronidazole	36	
22.	4/2/25	QSAR Studies.	37-41	

3.6 PHARMACEUTICAL FORMULATIONS (PRACTICAL)

Practical : 3 Hrs./Week

List of Experiments :

1. **Manufacture of Tablets**
   - **a.** Ordinary compressed tablet-wet granulation
   - **b.** Tablets prepared by direct compression.
   - **c.** Soluble tablet.
   - **d.** Chewable tablet.
2. **Formulation and filling of hard gelatin capsules**
3. **Manufacture of parenterals**
   - **a.** Ascorbic acid injection
   - **b.** Calcium gluconate injection
   - **c.** Sodium chloride infusion.
   - **d.** Dextrose and Sodium chloride injection/ infusion.
4. **Evaluation of Pharmaceutical formulations (QC tests)**
   - **a.** Tablets
   - **b.** Capsules
   - **c.** Injections
5. **Formulation of two liquid oral preparations and evaluation by assay**
   - **a.** Solution: Paracetamol Syrup
   - **b.** Antacid suspensions- Aluminum hydroxide gel
6. **Formulation of semisolids and evaluation by assay**
   - **a.** Salicyclic acid and benzoic acid ointment
   - **b.** Gel formulation Diclofenac gel
7. **Cosmetic preparations**
   - **a.** Lipsticks
   - **b.** Cold cream and vanishing cream
   - **c.** Clear liquid shampoo
   - **d.** Tooth paste and tooth powders.
8. **Tablet coating (demonstration)**

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	**03hrs**	**04hrs**

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

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Department of

Pharmaceutical Formulations.

Name: Saranya Balla. PIN No. 223G1T0005

Certified that this is the bonafide record of practical work done by

Mr./Ms. SABANYA BALA.

a student of 3rd pharmD *with Regd. No.* 223G1T0005

in the Pharmaceutical formulations *laboratory during the year* 2024-2025

No. of Experiments Conducted 20 No. of Experiments Attended 20

Signature - Faculty incharge

Signature-Head of the Department

PRINCIPAL
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Submitted for the practical examination held on 11-4-2025

Examiner-1

Examiner-2

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S.No.	Date	Name of the Experiment	Page No.	Remarks
I.	16/07/24	INTRODUCTION.	01-04	
01	23.07.24	Formulation of paracetmol by Wet granulation	05-08	
02	30.07.24	Evaluation of formulated paracetmol tablets	09-12	
03	06.08.24	Formulation of Diclofenac Sodium	13-14	
04	13.08.24	Formulation of Aspirin Tablets	15-16	
05	20.08.24	Formulation of Chewable Laxative tablets	17-18	
06	27.08.24	Formulation and filling of Hard gelatin capsule.	19-21	
II	03.09.24	Introduction to parentrals	22-23	
07.	10.09.24	formulation of Ascorbic Acid Injection	24-26	
08.	01.10.24	Formulation of calcium Gluconate Injection	27	
09.	15.10.24	formulation of Sodium chloride Injection.	28	
10.	22.10.24	Formulation of Dextrose and Nacl Injection	29	
11.	29.10.24	Formulation of paracetmol Syrup & Evaluation.	30-33	
III	12.11.24	Introduction to Cosmetics	34-35	
12.	19.11.24	preparation of cold creams	36-37	

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S.No.	Date	Name of the Experiment	Page No.	Remarks
13.	26.11.24	preparation of Vanishing Cream	38	
14.	03.12.24	preparation of Tooth powder	39-40	
15.	10.12.24	preparation of Liquid Shampoo	41	
16.	17.12.24	formulation of Aluminium Hydroxide Gel -Antacid Suspension.	42-44	
17.	07.01.25	preparation of Lip Stick	45-47	
18.	21.01.25	formulation of Salicylic acid & Benzoic Acid Ointment.	48-49	
19.	28.01.25	formulation of Diclofenac Sodium Gel & Evaluation by Assay.	50-53	
20.	04.02.25	preparation of tooth paste.	54-55	

4.4 BIOSTATISTICS AND RESEARCH METHODOLOGY (THEORY)

Theory : 2 Hrs. /Week

1. 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, semilogarthimic plots

2.3 **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.

A PROSPECTIVE OBSERVATIONAL STUDY: THE ROLE OF PROTEIN AND STRESS MANAGEMENT IN MUSCLE MASS AND QUALITY OF LIFE IN HEMODIALYSIS PATIENTS

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-KAKINADA

In partial fulfillment of the requirements for the Degree of

DOCTOR OF PHARMACY

Submitted by

DANDIPATI LALITHA MAHESWARI

(203G1T0005)

GUDIMETLA HIMA BINDU

(203G1T0008)

SANIVARAPU PUSHPA SATYA MAHALAKSHMI

(203G1T00019)

Under the esteemed guidance of

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MBBS, MD, DM

Sr. Consultant Nephrologist

Trust Multispeciality Hospitals, Kakinada

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PHARM D

Assistant Professor

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DEPARTMENT OF PHARMACY PRACTICE

ADITYA PHARMACY COLLEGE (A)

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Aditya Nagar, ADB Road, Surampalem-533437, Andhra Pradesh, India

DECLARATION

We hereby declare that the thesis entitled "A PROSPECTIVE OBSERVATIONAL STUDY: THE ROLE OF PROTEIN AND STRESS MANAGEMENT IN MUSCLE MASS AND QUALITY OF LIFE IN HEMODIALYSIS PATIENTS" is a bonafide project work carried out by us, under the guidance of *Dr. J. Bhargav Narendra, Assistant Professor, Aditya Pharmacy College (A)* and *Dr. D. V. S. Somayajulu, Senior Consultant Nephrologist & Renal Transplant Physician at Trust Multispeciality Hospitals, Kakinada,* in partial fulfilment of the requirements for the degree of Doctor of Pharmacy in the Department of Pharmacy Practice to Jawaharlal Nehru Technological University-Kakinada (JNTU-K). The work embodied in this thesis is original and has not been submitted in part or in full for any degree of this or any other university.

Place: Surampalem Date:

Dandipati Lallitha Maheswari

Gudimetla Hima Bindu

Sanivarapu pushpa satya mahalakshmi

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CERTIFICATE BY THE GUIDES

This is to certify that the thesis work entitled "A PROSPECTIVE OBSERVATIONAL STUDY: THE ROLE OF PROTEIN AND STRESS MANAGEMENT IN MUSCLE MASS AND QUALITY OF LIFE IN HEMODIALYSIS PATIENTS" is a bonafide Project work carried out by **DANDIPATI LALITHA MAHESWARI** (Reg. No. 203G1T0005), **GUDIMETLA HIMA BINDU** (Reg. No. 203G1T0008), **SANIVARAPU PUSHPA SATYA MAHALAKSHMI** (Reg. No. 203G1T0019), under the guidance of us at the Department of Pharmacy Practice, Aditya Pharmacy College (A), and Dept. of Nephrology, Trust Multispeciality Hospitals, Kakinada. In our opinion, this work has reached the standards in partial fulfillment of the requirements for the degree of **Doctor of Pharmacy** as per the regulations of the University.

Place: Surampalem & Kakinada

Date:

Dr. D.V.S.SOMAYAJULU
(Gen Med); DM Nephro (SGPGI-MS)
Consultant Nephrology & Transplant Physician
Trust Hospitals, Kakinada
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HOSPITAL GUIDE

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PHARM D.
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CERTIFICATE BY THE PRINCIPAL

This is to certify that the thesis work entitled, "A PROSPECTIVE OBSERVATIONAL STUDY: THE ROLE OF PROTEIN AND STRESS MANAGEMENT IN MUSCLE MASS AND QUALITY OF LIFE IN HEMODIALYSIS PATIENTS" is being submitted by **DANDIPATI LALITA MAHESWARI (Reg. No. 203G1T0005), GUDIMETLA HIMA BINDU(Reg. No. 203G1T0008), SANIVARAPU PUSHPA SATYA MAHALAKSHMI (Reg. No. 203G1T0019)** to **Jawaharlal Nehru Technological University, Kakinada (JNTUK)**, in partial fulfillment of the requirements of the degree of **DOCTOR OF PHARMACY** in the **Department of Pharmacy Practice** under the esteemed guidance of **Dr. D. Sathis Kumar**, Professor & Principal, is the bonafide project work carried out by them at the Department of Pharmacy Practice, Aditya Pharmacy College (A), Surampalem & Trust Multispeciality Hospitals, Kakianda.

The results incorporated in this work have not been submitted to any other university or institute for the award of any degree.

PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437

Dr. D. Sathis Kumar, M. Pharm., Ph. D.
Professor & Principal,
Aditya Pharmacy College (A),
Surampalem-533437

Place: Surampalem

Date:

PRINCIPAL
ADITYA PHARMACY COLLEGE(A),
SURAMPALEM-533 437

ADITYA PHARMACY COLLEGE (A)

Accredited by NAAC with 'A' Grade, Affiliated to JNTUK,
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Aditya Nagar, ADB Road, Surampalem-533437, Andhra Pradesh, India

EVALUATION CERTIFICATE

This is to certify that the thesis work entitled, "A PROSPECTIVE OBSERVATIONAL STUDY: THE ROLE OF PROTEIN AND STRESS MANAGEMENT IN MUSCLE MASS AND QUALITY OF LIFE IN HEMODIALYSIS PATIENTS" is a bonafide Project work done by **DANDIPATI LALITHA MAHESWARI**(Reg. No. 203G1T0005), **GUDIMETLA HIMA BINDU** (Reg. No. 203G1T0008), **SANIVARAPU PUSHPA SATYA MAHALAKSHMI** (Reg. No. 203G1T0019) submitted in partial fulfillment of the requirements for the degree of **DOCTOR OF PHARMACY** in the Department of Pharmacy Practice to Jawaharlal Nehru Technological University, Kakinada (JNTUK).

Place: Surampalem

Date:

Internal Examiner

Sign:

External Examiner

Sign:

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SURAMPALEM-533 437

CONCLUSION:

This study highlights the significant impact of physical symptoms, stress levels, and general health perceptions on the quality of life (QoL) of dialysis patients. The findings reveal that muscle soreness is one of the most influential factors, with a substantial chi-square value indicating a strong association with lower QoL. Muscle weight loss, stress, and low protein intake or protein loss were identified as major contributors to muscle soreness. The pronounced effect of muscle soreness underscores the necessity of implementing targeted interventions such as resistance training, adequate protein supplementation, and muscle maintenance programs to mitigate discomfort and enhance patient well-being. Cramps were also identified as a notable factor affecting QoL, though to a lesser extent than muscle soreness. Patients experiencing frequent cramps reported moderate reductions in their overall quality of life. This finding suggests that proactive management through hydration, nutritional adjustments, and appropriate medical interventions can alleviate the severity and frequency of cramps, contributing to improved patient outcomes.

While stress levels were significantly associated with decreased QoL. Additionally, general health perception was a strong predictor of QoL. Patients with a negative perception of their health status exhibited lower QoL scores. Comprehensive patient education programs focusing on self-care, treatment adherence, and healthy lifestyle modifications can empower patients to manage their condition effectively and perceive their health more positively.

Interestingly, factors such as dialysis frequency and time spent managing kidney disease did not show a significant association with QoL. This suggests that while the physical and psychological symptoms directly affect patient well-being, the procedural aspects of dialysis treatment may have a lesser impact when effectively managed.

In conclusion, a multifaceted approach combining personalized exercise programs, nutritional support, stress management, and continuous patient education can substantially enhance the quality of life of dialysis patients. Collaborative efforts among healthcare providers, including nephrologists, physiotherapists, dietitians, and mental health professionals, are essential to implement these interventions effectively.

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4.5 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.

4. Multicompartment models.
   a. Two compartment open model.
   b. IV bolus, IV infusion and oral administration

5. 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

6. Nonlinear Pharmacokinetics.
   a. Introduction
   b. Factors causing Non-linearity.
   c. Michaelis-menton method of estimating parameters.

7. Noncompartmental Pharmacokinetics.
   a. Statistical Moment Theory.
   b. MRT for various compartment models.
   c. Physiological Pharmacokinetic model.

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

ASSESSMENT OF DRUG UTILIZATION AND ASSOCIATED PROBLEMS IN PATIENTS RECEIVING ANTI-PLATELET TREATMENT IN THE CARDIOLOGY DEPARTMENT AT A TERTIARY CARE HOSPITAL

The thesis work submitted to

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-KAKINADA

In partial fulfillment of the requirements for the Degree of

DOCTOR OF PHARMACY

Submitted by

G. SHREYA RAJ
(203G1T0007)
TEJASWI PHANINDHRA YELCHURI
(203G1T0021)
TEKUMUNDI MANJARI
(203G1T0022)

Under the esteemed guidance of

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2025

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DECLARATION

We hereby declare that the thesis entitled "**ASSESSMENT OF DRUG UTILIZATION AND ASSOCIATED PROBLEMS IN PATIENTS RECEIVING ANTI-PLATELET TREATMENT IN THE CARDIOLOGY DEPARTMENT AT A TERTIARY CARE HOSPITAL**" is a bonafide project work carried out by us, under the guidance of ***Ms. P. RATNA KUMARI, Associate Professor, Department of Pharmacy Practice, Aditya Pharmacy College (A)*** and ***Dr. B. DURGA PAVAN KUMAR , Consultant Cardiologist and at Trust Multispecialty Hospitals, Kakinada,*** in partial fulfillment of the requirements for the Award of the Degree of **Doctor of Pharmacy** in the Department of Pharmacy Practice to **Jawaharlal Nehru Technological University-Kakinada (JNTU-K)**. The work embodied in this thesis is original and has not been submitted in part or in full for any degree of this or any other university.

Place: Surampalem

Date: 20-3-2025

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Tejaswi Phanindhra yelchuri
Tekumudi Manjari

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CERTIFICATE BY THE GUIDES

This is to certify that the thesis work entitled "ASSESSMENT OF DRUG UTILIZATION AND ASSOCIATED PROBLEMS IN PATIENTS RECEIVING ANTI-PLATELET TREATMENT IN THE CARDIOLOGY DEPARTMENT AT A TERTIARY CARE HOSPITAL" is a Bonafide Project work carried out by G. SHREYA RAJ (Reg. No. 203G1T0007), TEJASWI PHANINDHRA YELCHURI (Reg. No. 203G1T0021), &TEKUMUDI MANJARI (Reg. No. 203G1T0022) under the guidance of us at the Department of Pharmacy Practice, Aditya Pharmacy College (A), and Department of Cardiology, Trust Multispecialty Hospitals, Kakinada. In our opinion, this work has reached the standards in fulfillment of the partial requirement for the award of the degree of **Doctor of Pharmacy** per the regulations of the University.

Place: Surampalem & Kakinada

Date: 20/3/25

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The results incorporated in this work have not been submitted to any other university or institute for the award of any degree.

Dr. D. Sathis Kumar,
M. Pharm, Ph. D.
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EVALUATION CERTIFICATE

This is to certify that the thesis work entitled, "ASSESSMENT OF DRUG UTILIZATION AND ASSOCIATED PROBLEMS IN PATIENTS RECEIVING ANTI-PLATELET TREATMENT IN THE CARDIOLOGY DEPARTMENT AT A TERTIARY CARE HOSPITAL" is a bonafide Project work done by G. SHREYA RAJ (Reg. No. 203G1T0007), TEJASWI PHANINDHRA YELCHURI (Reg. No. 203G1T0021), &TEKUMUDI MANJARI (Reg. No. 203G1T0022) submitted in partial fulfilment for the award of the degree of DOCTOR OF PHARMACY in the Department of Pharmacy Practice to Jawaharlal Nehru Technological University, Kakinada (JNTUK).

Place: Surampalem

Date: 20/03/2025

Internal Examiner

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External Examiner

Sign:

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9. CONCLUSION:

This study investigates drug use patterns, demographics, and drug-related problems (DRPs) among patients undergoing antiplatelet therapy. Of 110 patients, 67.3% were on Dual Antiplatelet Therapy (DAPT) and 32.7% on Single Antiplatelet Therapy (SAPT). Age and gender did not affect therapy selection significantly ($p = 0.241$, $p = 0.460$), although younger (21-40 years) and middle-aged (51-70 years) patients preferred DAPT, whereas SAPT was predominant in elderly patients (71-80 years). Comorbidities were of significant importance, with DAPT being used in patients with co-morbid conditions such as diabetes and hypertension, while SAPT was used more commonly in patients with hypertension or no comorbid conditions. DAPT was found to have a much higher risk of ADRs and drug interactions ($p = 0.0064$) and thus warranted close monitoring. Despite these risks, laboratory parameters did not change, highlighting the requirement for personalized therapy. Multidisciplinary treatment, including patient education and the role of the pharmacist, is necessary to maximize safety and efficacy, and further research must be conducted to improve therapy approaches.

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4.1 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, 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	**03hrs**	**04hrs**

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

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in the Therapeutic-III *Laboratory during the year* 2024-25

No. of Experiments Conducted 16 No. of Experiments Attended 16

Signature - Faculty incharge

Signature-Head of the Department

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Examiner-1

Examiner-2

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Pointer

S.No.	Date	Name of the Experiment	Page No.	Remarks
1.	5/8/24	Ascites	1-2	
2.	12/8/24	Corrosive ingestion	3-5	
3.	19/8/24	Acute Intestinal obstruction	6-8	
4.	9/9/24	Sub Acute Appendicitis	9-10	
5.	16/9/24	Hiatal hernia with gastritis	11-13	
6.	23/9/24	Hepatitis	14-16	
7.	30/9/24	Ischemic stroke	17-19	
8.	28/10/24	Chronic calcific Pancreatitis	20-22	
9.	28/10/24	Hydrocephalus due to TB-Meningitis	23-25	
10.	4/11/24	Parkinsonism	26-28	
11.	11/11/24	Generalized Convulsive Status Epilepticus	29-31	
12.	18/11/24	Achalasia cardia	32-33	
13.	25/11/24	Choledocholithiasis	34-36	

Pointer

S.No.	Date	Name of the Experiment	Page No.	Remarks
14.	16/12/24	Sub-Arachnoid Hemmorhage	37-39	
15.	6/1/25	L4 and L5 Over Grade-II Anterolisthesis	40-43	
16.	03/02/25	D12 Wedge compression	44-46	

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5 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

6 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

7 Continuing professional development programs

Education and training

8 Radio Pharmaceuticals – Handling and packaging

9 Professional Relations and practices of hospital pharmacist

4.2 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	**03hrs**	**04hrs**

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

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Mr./Ms. A. Sri Satya Shinney

a student of IV-Pharm.D *with Regd. No.* 213G1T0001

in the Hospital Pharmacy *Laboratory during the year* 2024-25

No. of Experiments Conducted 21 No. of Experiments Attended 21

Signature - Faculty incharge Signature-Head of the Department

Submitted for the practical examination held on 21/03/2025

Examiner-1 Examiner-2

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Pointer

S.No.	Date	Name of the Experiment	Page No.	Remarks
	15/6/24	Introduction	1-3	
1.	22/6/24	Drug Profile of Furosemide	4-6	PH
2.	29/6/24	Drug Profile of Metformin	7-9	
3.	6/7/24	Drug Profile of Aspirin	10-12	
4.	13/7/24	Drug Profile of Clopidogrel	13-14	
	20/7/24	Introduction to Parenterals	15-17	
5.	27/7/24	Sodium Chloride Injection	18	PH
6.	3/8/24	Dextrose and sodium chloride Infusion	19-20	
7.	10/8/24	Compound Sodium Lactate Injection I.P	21-22	
	17/8/24	Introduction to Powders	23-25	
8.	24/8/24	Oral Rehydration Salt	26	PH
9.	17/9/24	Medicated Dusting Powder	40-41	
	21/9/24	Introduction to Drug Interactions	27-31	
	28/9/24			
10.	5/10/24	Case on Drug Interaction-1	32-33	
11.	19/10/24	Case on Drug Interaction-2	34-35	PH
12.	26/10/24	Case on Drug Interaction-3	36-37	
13.	7/11/24	Case on Drug Interaction-4	38-39	
14.	10/11/24	Case on Drug Interaction-5	42-43	
	23/11/24	Introduction to Drug Information Query	44-48	
15.	7/12/24	Drug Information Query-1	49-50	
16.	14/12/24	Drug Information Query-2	51-53	PH
17.	21/12/24	Drug Information Query-3	54-56	
18.	28/12/24	Drug Information Query-4	57-59	

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Pointer

S.No.	Date	Name of the Experiment	Page No.	Remarks
	4/1/25	Inventory Control	60-64	
19.	25/1/25	Inventory Case study-1	65	
20.	1/2/25	Inventory Case study-2	66-67	
21.	8/2/25	Inventory Case Study-3	68-69	

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3. **Patient data analysis**
   The patient's case history, its structure and use in evaluation of drug therapy & Understanding common medical abbreviations and terminologies used in clinical practices.
4. **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
5. **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
6. **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.
7. Communication skills, including patient counselling techniques, medication history interview, presentation of cases.
8. Pharmaceutical care concepts
9. Critical evaluation of biomedical literature
10. Medication errors

4.3 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.

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in the Clinical Pharmacy *Laboratory during the year* 2024-25

No. of Experiments Conducted 16 No. of Experiments Attended 16

3/3/25

Signature - Faculty incharge

Signature-Head of the Department

Submitted for the practical examination held on 20/03/2025

Examiner-1

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Examiner-2

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Pointer

S.No.	Date	Name of the Experiment	Page No.	Remarks
	8/8/24	Introduction to Drug Information Queries	1-5	Cer
1.	22/8/24	Drug Information Query-1	6-8	Cer
2.	29/8/24	Drug Information Query-2	9-10	Cer
3.	5/9/24	Drug Information Query-3	11	Cer
4.	12/9/24	Drug Information Query-4	12-13	Cer
5.	19/9/24	Patient medication Counselling-1	14-16	Cer
6.	26/9/24	Patient medication Counselling-2	17-18	Cer
7.	3/10/24	Patient medication Counselling-3	19-20	Cer
8.	24/10/24	Patient medication Counselling-4	21-22	Cer
	14/11/24	Medication history Interview	23-26	Cer
9.	14/11/24	Medication history interview-1	27	Cer
10.	21/11/24	Medication history interview-2	28	Cer
11.	28/11/24	Medication history interview-3	29	Cer
12.	5/12/24	Medication history interview-4	30	Cer

Pointer

S.No.	Date	Name of the Experiment	Page No.	Remarks
	12/12/24	Introduction to Laboratory Data Interpretation	31-35	
13.	12/12/24	Laboratory Data Interpretation-1	36-37	
14.	19/12/24	Laboratory Data Interpretation-2	38-39	
15.	30/1/25	Laboratory Data Interpretation-3	40-41	
16.	6/2/25	Laboratory Data Interpretation-4	42-43	

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4.5 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 products 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, $t_1/2$, 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 Clinical 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 4th 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.

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Examiner-1

Examiner-2

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Pointer

S.No.	Date	Name of the Experiment	Page No.	Remarks
	18/6/24	Introduction	1-2	
1.	25/6/24	Effect of Binder on dissolution	3-6	
	2/7/24	rate of Paracetamol		3/7
2.	9/7/24	Evaluation of dissolution rate of commercial brands of Paracetamol tablets as per IP/BP/USP	7-11	10/7
3.	16/7/24	Effect of Diluent on	12-16	
	23/7/24	dissolution rate of paracetamol		21/8
4.	30/7/24	Effect of Disintegrant on	17-20	
	6/8/24	dissolution rate of Paracetamol		
5.	13/8/24	Evaluation of hypothetical	21-23	
	20/8/24	dissolution of two brands of Paracetamol tablets		23/8
6.	27/8/24	Study of Protein binding of	24-27	
	17/9/24	Nimesulide using a semi permeable membrane		2/10
7.	24/9/24	Evaluation of Dissolution	28-31	
	1/10/24	rate of Diclofenac sustained release & Diclofenac conventional tablets		30/10
8.	15/10/24	Effect of solubility enhancer	32-35	
	22/10/24	on dissolution rate of Paracetamol		
	29/10/24	Introduction to Pharmacokinetics	36-37	
9.	5/11/24	Estimation of different	38-40	
		pharmacokinetic parameters by enlarging one compartment open model IV bolus data		2/11

Pointer

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