



SANTHIRAM COLLEGE OF PHARMACY

Approved by AICTE & PCI, New Delhi - Affiliated to JNTUA, Anantapur
NH - 18, Nandyal, Kurnool District, Andhra Pradesh - 518501.

1.2.1

Number of Programmes in Which
Choice Based Credit System
(CBCS/Elective Course System
Has Been Implemented)



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1.2.1.1

Number of Programmes in Which
Choice Based Credit System
(CBCS/Elective Course System Has
Been Implemented)

Academic year (2022-2023)



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1.2.1 Number of Programmes in which Choice Based Credit System (CBCS)/ elective course system has been implemented

1.2.1.1 - Number of Programmes in which CBCS/ Elective course system implemented -02 (Academic Year 2022-23)

IMPLEMENTATION OF CBCS:

S.NO	COURSE NAME	ELECTIVE SUBJECTS	ELECTED SUBJECT
1	B.PHARMACY IV/II (Semester-VIII)	I) Pharma Marketing Mangement (BP803ET) II)Pharmaceutical Regulatory science (BP804ET) III) Pharmacovigilance (BP805ET) IV)Quality Control and standardization OF Herbals(BP806ET) V) Computer Aided Drug Design(BP807ET) VI) Cell and Molecular Biology(BP808ET) VII) Cosmetics Science (BP809ET) VIII) Experimental Pharmacology (BP8010ET) IX) Advanced Instrumentation Technique (BP811ET) X(Dietary Supplements and Nutraceuticals (BP812ET)	I) Pharmacovigilance (BP805ET) II) Advanced Instrumentation Technique (BP811ET)




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S.NO	COURSE NAME	ELECTIVE SUBJECTS	Audit Course-I
1.	M.PHARMACY (Semester-I) 1.Pharmaceutics 2.Industrial Pharmacy 3.Pharmaceutical Analysis 4.Pharmacology	I) English For Research Paper Writing (21DAC101A) II) Disaster Management (21DAC101B) Sanskrit For Technical Knowledge(21DAC101C)	English for Research paper writing (21DAC101A)

S.NO	COURSE NAME	ELECTIVE SUBJECTS	Audit Course-II
2.	M.PHARMACY (Semester-II) 1.Pharmaceutics 2.Industrial Pharmacy 3.Pharmaceutical Analysis 4.Pharmacology	I) PedagogyStudies(21DAC201a) II) Stress Management for Yoga(21DAC201b) III) Personality Development through Life Enlightenment Skills (21DAC201c)	Pedagogy Studies (21DAC201a)

S.NO	COURSE NAME	OPEN ELECTIVE SUBJECTS	OPEN ELECTED SUBJECT
3.	M.PHARMACY (Semester-III) 1.Pharmaceutics 2.Industrial Pharmacy 3.Pharmaceutical Analysis 4.Pharmacology	I) Biological Screening methods(21SOE301d) II) Pharmaceutical Validation) 21SOE301a) III) Entrepreneurship Management (21SOE301c)	1.Biological Screening methods(21SOE301d) 2.Pharmaceutical Validation) 21SOE301a)



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Academic Regulations (R19) for
B.Pharm (Regular-Full time)
(Effective for the students admitted into 1 year from the Academic Year 2019-2020 onwards)

Pharmacy Council of India
New Delhi

Rules & Syllabus for the Bachelor of Pharmacy (B. Pharm) Course

[Framed under Regulation 6, 7 & 8 of the Bachelor of
Pharmacy (B. Pharm) course regulations 2014]

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Table-VIII: Course of study for semester VIII

Course code	Name of the course	No. of Hours	Tutorial	Credit points
BP801T	Biostatistics and Research Methodology	3	1	4
BP802T	Social and Preventive Pharmacy	3	1	4
BP803ET	Pharma Marketing Management	3 + 3 = 6	1 + 1 = 2	4 + 4 = 8
BP804ET	Pharmaceutical Regulatory Science			
BP805ET	Pharmacovigilance			
BP806ET	Quality Control and Standardization of Herbals			
BP807ET	Computer Aided Drug Design			
BP808ET	Cell and Molecular Biology			
BP809ET	Cosmetic Science			
BP810ET	Experimental Pharmacology			
BP811ET	Advanced Instrumentation Techniques			
BP812ET	Dietary Supplements and Nutraceuticals			
BP813PW	Project Work	12	-	6
BP814MC	Essence of India Traditional Knowledge ^e	-	-	-
BP815CV	Comprehensive Viva-Voce ^e – VIII	-	-	-
Total		24	4	22

^e Non University Examination (NUE) with grading

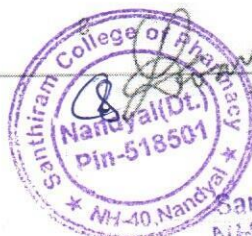
Table-IX: Semester wise credits distribution

Semester	Credit Points
I	27/29 ^b /30 ^a
II	29
III	26
IV	28
V	26
VI	26
VII	24
VIII	22
Extracurricular/ Co curricular activities	01 ^b
Total credit points for the program	209/211 ^b /212 ^a

^a The credit points assigned for extracurricular and or co-curricular activities shall be given by the Principals of the colleges and the same shall be submitted to the University. The criteria to acquire this credit point shall be defined by the colleges from time to time.

^b Applicable ONLY for the students studied Physics / Chemistry / Botany / Zoology at HSC and appearing for Remedial Mathematics course.

^c Applicable ONLY for the students studied Mathematics / Physics / Chemistry at HSC and appearing for Remedial Biology course.



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M.PHARM. IN PHARMACEUTICS
COURSE STRUCTURE & SYLLABI

SEMESTER – I

S. No.	Course codes	Course Name	Hours per			Credits
			L	T	P	
1.	21S01101	Modern Pharmaceutical Analytical Techniques	4	-	-	4
2.	21S03101	Advanced Physical Pharmaceutics	4	-	-	4
3.	21S03102	Modern Pharmaceutics-I	4	-	-	4
4.	21S03103	Advanced Biopharmaceutics & Pharmacokinetics	4	-	-	4
5.	21S01105	Modern Pharmaceutical Analytical Techniques lab	-	-	6	3
6.	21S03104	Modern Pharmaceutics -I lab	-	-	6	3
7.		Audit Course – I	2	-	-	0
	21DAC101a	English for Research paper writing				
	21DAC101b	Disaster Management				
	21DAC101c	Sanskrit for Technical Knowledge				
8.	21S03105	Seminar/Assignment	-	1	6	4
		Total	18	1	18	26

SEMESTER – II

S.No.	Course codes	Course Name	Hours per			Credits
			L	T	P	
1.	21S03201	Modern Pharmaceutics-II	4	-	-	4
2.	21S03202	Advanced Drug Delivery system	4	-	-	4
3.	21S03203	Industrial Pharmacy	4	-	-	4
4.	21S03204	Nano Drug Delivery system	4	-	-	4
5.	21S03205	Modern Pharmaceutics-II Lab	-	-	6	3
6.	21S03206	Advanced Drug Delivery System Lab	-	-	6	3
7.		Audit Course – II	2	-	-	0
	21DAC201a	Pedagogy Studies				
	21DAC201b	Stress Management for Yoga				
	21DAC201c	Personality Development through Life Enlightenment Skills				
8.	21S03207	Seminar/Assignment	-	1	6	4
		Total	18	1	18	26



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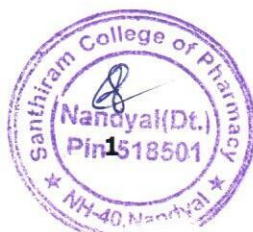
COURSE STRUCTURE & SYLLABI

SEMESTER – I

S. No.	Course codes	Course Name	Hours per week			Credits
			L	T	P	
1.	21S01101	Modern Pharmaceutical Analytical Techniques	4	-	-	4
2.	21S03101	Advanced Physical Pharmaceutics	4	-	-	4
3.	21S08101	Pharmaceutical formulation Development	4	-	-	4
4.	21S03103	Advanced Biopharmaceutics & Pharmacokinetics	4	-	-	4
5.	21S01105	Modern Pharmaceutical Analytical Techniques Lab	-	-	6	3
6.	21S08102	Advanced Physical Pharmaceutics Lab	-	-	6	3
7.	21DAC101a 21DAC101b 21DAC101c	Audit Course – I English for Research paper writing Disaster Management Sanskrit for Technical Knowledge	2	-	-	0
8.	21S08103	Seminar/Assignment	-	1	6	4
		Total	18	1	18	26

SEMESTER – II

S.No.	Course codes	Course Name	Hours per week			Credits
			L	T	P	
1.	21S08201	Pharmaceutical Production Technology	4	-	-	4
2.	21S08202	Advanced Drug Delivery systems	4	-	-	4
3.	21S08203	Pharmaceutical Industrial Management	4	-	-	4
4.	21S03204	Nano Drug Delivery systems	4	-	-	4
5.	21S08204	Pharmaceutical Production Technology Lab	-	-	6	3
6.	21S03206	Advanced Drug Delivery systems Lab	-	-	6	3
7.	21DAC201a 21DAC201b 21DAC201c	Audit Course – II Pedagogy Studies Stress Management for Yoga Personality Development through Life Enlightenment Skills	2	-	-	0
8.	21S08205	Seminar/Assignment	-	1	6	4
		Total	18	1	18	26



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M.PHARM. PHARMACEUTICAL ANALYSIS

COURSE STRUCTURE & SYLLABI

SEMESTER – I

S. No.	Course codes	Course Name	Hours per week			Credits
			L	T	P	
1.	21S01101	Modern Pharmaceutical Analytical Techniques	4	-	-	4
2.	21S07101	Advanced Pharmaceutical Analysis	4	-	-	4
3.	21S07102	Pharmaceutical and Food Analysis	4	-	-	4
4.	21S07103	Quality Control And Quality Assurance	4	-	-	4
5.	21S01105	Modern Pharmaceutical Analytical Techniques Lab	-	-	6	3
6.	21S07104	Pharmaceutical and Food Analysis Lab	-	-	6	3
7.	21DAC101a 21DAC101b 21DAC101c	Audit Course – I English for Research paper writing Disaster Management Sanskrit for Technical Knowledge	2	-	-	0
8.		Seminar/Assignment	-	1	6	4
		Total	18	1	18	26

SEMESTER – II

S.No.	Course codes	Course Name	Hours per week			Credits
			L	T	P	
1.	21S07201	Advanced Instrumental Analysis	4	-	-	4
2.	21S07202	Modern Bio-Analytical Techniques	4	-	-	4
3.	21SOE301a	Pharmaceutical Validation	4	-	-	4
4.	21S07203	Herbal and Cosmetic Analysis	4	-	-	4
5.	21S07204	Advanced Instrumental Analysis Lab	-	-	6	3
6.	21S07205	Modern Bio-Analytical Techniques Lab	-	-	6	3
7.	21DAC201a 21DAC201b 21DAC201c	Audit Course – II Pedagogy Studies Stress Management for Yoga Personality Development through Life Enlightenment Skills	2	-	-	0
8.	21S07206	Seminar/Assignment	-	1	6	4
		Total	18	1	18	26



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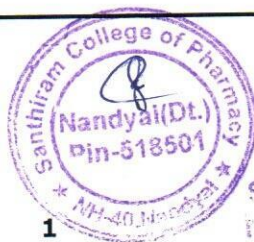
COURSE STRUCTURE & SYLLABI

SEMESTER – I

S. No.	Course code	Course Name	Hours per week			Credits
			L	T	P	
1.	21S01101	Modern Pharmaceutical Analytical Techniques	4	-	-	4
2.	21S01102	Advanced Pharmacology-I	4	-	-	4
3.	21S01103	Clinical Pharmacology and Pharmacotherapeutics	4	-	-	4
4.	21S01104	Cellular and Molecular Pharmacology	4	-	-	4
5.	21S01105	Modern Pharmaceutical Analytical Techniques Lab	-	-	6	3
6.	21S01106	Advanced Pharmacology – I Lab	-	-	6	3
7.	21DAC101a 21DAC101b 21DAC101c	Audit Course – I English for Research paper writing Disaster Management Sanskrit for Technical Knowledge	2	-	-	0
8.	21S01107	Seminar/Assignment	-	1	6	4
		Total	18	1	18	26

SEMESTER – II

S.No.	Course code	Course Name	Hours per			Credits
			L	T	P	
1.	21S01201	Advanced Pharmacology- II	4	-	-	4
2.	21S01202	Pharmacological Screening Methods & Toxicology	4	-	-	4
3.	21S01203	Principles of Drug Discovery	4	-	-	4
4.	21S01204	Clinical research and Pharmacovigilance	4	-	-	4
5.	21S01205	Advanced Pharmacology -II Lab	-	-	6	3
6.	21S01206	Pharmacological Screening Methods & Toxicology Lab	-	-	6	3
7.	21DAC201a 21DAC201b 21DAC201c	Audit Course – II Pedagogy Studies Stress Management from Yoga Personality Development through Life Enlightenment Skills	2	-	-	0
8.	21S01207	Seminar/Assignment	-	1	6	4
		Total	18	1	18	26



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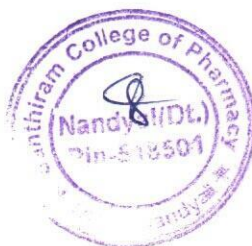
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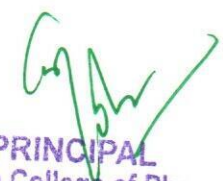
SEMSTER - III

S.No.	Course codes	Course Name	Hours per			Credits
				T	P	
1.	21DRM101	Research Methodology and Intellectual Property Right	4	-	-	4
2.	21SOE301d 21SOE301a 21SOE301c	Open Elective Biological Screening methods Pharmaceutical Validation Entrepreneurship Management	3	-	-	3
3.	21S03301	Teaching Practice/Assignment	-	-	4	2
4.	21S03302	Comprehensive viva voce	-	-	-	2
5.	21S03303	Research Work - I	-		24	12
Total			7	-	32	23

SEMESTER - IV

S.No.	Course codes	Course Name	Hours per week			Credits
			L	T	P	
1.	21S03401	Co-Curricular Activities	2			2
2.	21S03402	Research Work - II	3		30	18
Total			5		30	20




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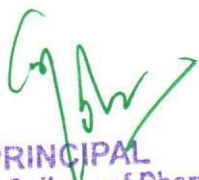
SEMESTER - III

S.No.	Course codes	Course Name	Hours per week			Credits
			L	T	P	
1.	21DRM101	Research Methodology and Intellectual Property Right	4	-	-	4
2.		Electives	3	-	-	3
	21SOE301d	Biological Screening methods				
	21SOE301a	Pharmaceutical Validation				
	21SOE301c	Entrepreneurship Management				
3.	21S08301	Teaching Practice/Assignment	-	-	4	2
4.	21S08302	Comprehensive viva voce	-	-	4	2
5.	21S08303	Research Work - I	-	-	24	12
		Total	7	-	32	23

SEMESTER - IV

S.No.	Course codes	Course Name	Hours per week			Credits
			L	T	P	
1.	21S08401	Co-Curricular Activities	2			2
2.	21S08402	Research Work - II	3		30	18
		Total	5		30	20




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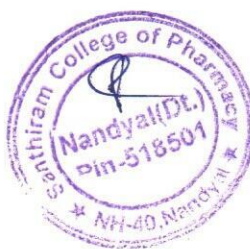
M.PHARM. IN PHARMACEUTICAL ANALYSIS


COURSE STRUCTURE & SYLLABI
SEMSTER - III

S.No.	Course codes	Course Name	Hours per week			Credits
			L	T	P	
1.	21DRM101	Research Methodology and Intellectual Property Right	4	-	-	4
2.	21SOE301d 21SOE301f 21SOE301e	Open Electives Biological Screening methods Stability of Drugs and Dosage forms Pharmacoepidemiology and Pharmacoeconomics	3	-	-	3
3.	21S07301	Teaching Practice/Assignment	-	-	4	2
4.	21S07302	Comprehensive viva voce	-	-	4	2
5.	21S07303	Research Work - I	-	-	24	12
		Total	7	-	32	23

SEMESTER - IV

S.No.	Course codes	Course Name	Hours per week			Credits
			L	T	P	
1.	21S07401	Co-Curricular Activities	2			2
2.	21S07402	Research Work - II	3		30	18
		Total	5		30	20




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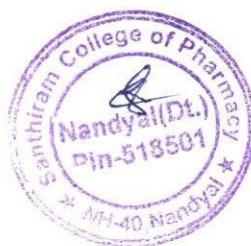
COURSE STRUCTURE SYLLABI

SEMSTER - III

S.No.	Course code	Course Name	Hours per			Credits
			L	T	P	
1.	21DRM101	Research Methodology and Intellectual Property Rights	4	-	-	4
2.		Open Elective	3	-	-	3
	21SOE301a	Pharmaceutical Validation				
	21SOE301b	Biostatistics				
	21SOE301c	Entrepreneurship Management				
3.	21S01302	Teaching Practice/Assignment	-	-	4	2
4.	21S01303	Comprehensive viva voce	-	-	-	2
	21S01304	Research Work – I	-	-	24	12
		Total	7	-	32	23

SEMESTER - IV

S.No.	Course code	Course Name	Hours per			Credits
			L	T	P	
1.	21S01401	Co-Curricular Activities	2			2
2.	21S01402	Research Work – II	3		30	18
		Total	5		30	20




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BP 805T: PHARMACOVIGILANCE (Theory)

45 hours

Scope: This paper will provide an opportunity for the student to learn about development of pharmacovigilance as a science, basic terminologies used in pharmacovigilance, global scenario of Pharmacovigilance, train students on establishing pharmacovigilance programme in an organization, various methods that can be used to generate safety data and signal detection. This paper also develops the skills of classifying drugs, diseases and adverse drug reactions.

Objectives:

At completion of this paper it is expected that students will be able to (know, do, and appreciate):

1. Why drug safety monitoring is important?
2. History and development of pharmacovigilance
3. National and international scenario of pharmacovigilance
4. Dictionaries, coding and terminologies used in pharmacovigilance
5. Detection of new adverse drug reactions and their assessment
6. International standards for classification of diseases and drugs
7. Adverse drug reaction reporting systems and communication in pharmacovigilance
8. Methods to generate safety data during pre clinical, clinical and post approval phases of drugs' life cycle
9. Drug safety evaluation in paediatrics, geriatrics, pregnancy and lactation
10. Pharmacovigilance Program of India (PvPI) requirement for ADR reporting in India
11. ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning
12. CIOMS requirements for ADR reporting
13. Writing case narratives of adverse events and their quality.

Course Content

Unit I

10 Hours

Introduction to Pharmacovigilance

- History and development of Pharmacovigilance
- Importance of safety monitoring of Medicine
- WHO international drug monitoring programme
- Pharmacovigilance Program of India(PvPI)

Introduction to adverse drug reactions

- Definitions and classification of ADRs
- Detection and reporting
- Methods in Causality assessment
- Severity and seriousness assessment
- Predictability and preventability assessment
- Management of adverse drug reactions

Basic terminologies used in pharmacovigilance



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- Terminologies of adverse medication related events
- Regulatory terminologies

Unit II

10 hours

Drug and disease classification

- Anatomical, therapeutic and chemical classification of drugs
- International classification of diseases
- Daily defined doses
- International Non proprietary Names for drugs

Drug dictionaries and coding in pharmacovigilance

- WHO adverse reaction terminologies
- MedDRA and Standardised MedDRA queries
- WHO drug dictionary
- Eudravigilance medicinal product dictionary

Information resources in pharmacovigilance

- Basic drug information resources
- Specialised resources for ADRs

Establishing pharmacovigilance programme

- Establishing in a hospital
- Establishment & operation of drug safety department in industry
- Contract Research Organisations (CROs)
- Establishing a national programme

Unit III

10 Hours

Vaccine safety surveillance

- Vaccine Pharmacovigilance
- Vaccination failure
- Adverse events following immunization

Pharmacovigilance methods

- Passive surveillance – Spontaneous reports and case series
- Stimulated reporting
- Active surveillance – Sentinel sites, drug event monitoring and registries
- Comparative observational studies – Cross sectional study, case control study and cohort study
- Targeted clinical investigations

Communication in pharmacovigilance

- Effective communication in Pharmacovigilance
- Communication in Drug Safety Crisis management
- Communicating with Regulatory Agencies, Business Partners, Healthcare facilities & Media



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Unit IV

8 Hours

Safety data generation

- Pre clinical phase
- Clinical phase
- Post approval phase (PMS)

ICH Guidelines for Pharmacovigilance

- Organization and objectives of ICH
- Expedited reporting
- Individual case safety reports
- Periodic safety update reports
- Post approval expedited reporting
- Pharmacovigilance planning
- Good clinical practice in pharmacovigilance studies

Unit V

7 hours

Pharmacogenomics of adverse drug reactions

- Genetics related ADR with example focusing PK parameters.

Drug safety evaluation in special population

- Paediatrics
- Pregnancy and lactation
- Geriatrics

CIOMS

- CIOMS Working Groups
- CIOMS Form

CDSCO (India) and Pharmacovigilance

- D&C Act and Schedule Y
- Differences in Indian and global pharmacovigilance requirements

Recommended Books (Latest edition):

1. Textbook of Pharmacovigilance: S K Gupta, Jaypee Brothers, Medical Publishers.
2. Practical Drug Safety from A to Z By Barton Cobert, Pierre Biron, Jones and Bartlett Publishers.
3. Mann's Pharmacovigilance: Elizabeth B. Andrews, Nicholas, Wiley Publishers.
4. Stephens' Detection of New Adverse Drug Reactions: John Talbot, Patrick Walle, Wiley Publishers.
5. An Introduction to Pharmacovigilance: Patrick Waller, Wiley Publishers.
6. Cobert's Manual of Drug Safety and Pharmacovigilance: Barton Cobert, Jones & Bartlett Publishers.
7. Textbook of Pharmacoepidemiology edited by Brian L. Strom, Stephen E Kimmel, Sean Hennessy, Wiley Publishers.
8. A Textbook of Clinical Pharmacy Practice -Essential Concepts and Skills: G. Parthasarathi, Karin Nyfort Hansen, Milap C. Nahata
9. National Formulary of India
10. Text Book of Medicine by Yashpal Munjal



BP 811 ET. ADVANCED INSTRUMENTATION TECHNIQUES

45 Hours

Scope: This subject deals with the application of instrumental methods in qualitative and quantitative analysis of drugs. This subject is designed to impart advanced knowledge on the principles and instrumentation of spectroscopic and chromatographic hyphenated techniques. This also emphasizes on theoretical and practical knowledge on modern analytical instruments that are used for drug testing.

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

- understand the advanced instruments used and its applications in drug analysis
- understand the chromatographic separation and analysis of drugs.
- understand the calibration of various analytical instruments
- know analysis of drugs using various analytical instruments.

Course Content:

UNIT-I

10 Hours

Nuclear Magnetic Resonance spectroscopy

Principles of H-NMR and C-NMR, chemical shift, factors affecting chemical shift, coupling constant, Spin - spin coupling, relaxation, instrumentation and applications

Mass Spectrometry- Principles, Fragmentation, Ionization techniques – Electron impact, chemical ionization, MALDI, FAB, Analyzers-Time of flight and Quadrupole, instrumentation, applications

UNIT-II

10 Hours

Thermal Methods of Analysis: Principles, instrumentation and applications of Thermogravimetric Analysis (TGA), Differential Thermal Analysis (DTA), Differential Scanning Calorimetry (DSC)

X-Ray Diffraction Methods: Origin of X-rays, basic aspects of crystals, X-ray

Crystallography, rotating crystal technique, single crystal diffraction, powder diffraction, structural elucidation and applications.

UNIT-III

10 Hours

Calibration and validation-as per ICH and USFDA guidelines

Calibration of following Instruments

Electronic balance, UV-Visible spectrophotometer, IR spectrophotometer,



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Fluorimeter, Flame Photometer, HPLC and GC

UNIT-IV

08 Hours

Radio immune assay: Importance, various components, Principle, different methods, Limitation and Applications of Radio immuno assay

Extraction techniques: General principle and procedure involved in the solid phase extraction and liquid-liquid extraction

UNIT-V

07 Hours

Hyphenated techniques- LC-MS/MS, GC-MS/MS, HPTLC-MS.

Recommended Books (Latest Editions)

1. Instrumental Methods of Chemical Analysis by B.K Sharma
2. Organic spectroscopy by Y.R Sharma
3. Text book of Pharmaceutical Analysis by Kenneth A. Connors
4. Vogel's Text book of Quantitative Chemical Analysis by A.I. Vogel
5. Practical Pharmaceutical Chemistry by A.H. Beckett and J.B. Stenlake
6. Organic Chemistry by I. L. Finar
7. Organic spectroscopy by William Kemp
8. Quantitative Analysis of Drugs by D. C. Garrett
9. Quantitative Analysis of Drugs in Pharmaceutical Formulations by P. D. Sethi
10. Spectrophotometric identification of Organic Compounds by Silverstein



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ANANTHAPURAMU – 515 002 (A.P) INDIA

M.PHARM. IN PHARMACEUTICS
COURSE STRUCTURE & SYLLABI

Course Code	ENGLISH FOR RESEARCH PAPER WRITING	L	T	P	C
21DAC101a		2	0	0	0
Semester		I			
Course Objectives: This course will enable students:					
<ul style="list-style-type: none"> • Understand the essentials of writing skills and their level of readability • Learn about what to write in each section • Ensure qualitative presentation with linguistic accuracy 					
Course Outcomes (CO): Student will be able to					
<ul style="list-style-type: none"> • Understand the significance of writing skills and the level of readability • Analyze and write title, abstract, different sections in research paper • Develop the skills needed while writing a research paper 					
UNIT - I		Lecture Hrs:10			
1 Overview of a Research Paper- Planning and Preparation- Word Order- Useful Phrases - Breaking up Long Sentences-Structuring Paragraphs and Sentences-Being Concise and Removing Redundancy -Avoiding Ambiguity					
UNIT - II		Lecture Hrs:10			
Essential Components of a Research Paper- Abstracts- Building Hypothesis-Research Problem - Highlight Findings- Hedging and Criticizing, Paraphrasing and Plagiarism, Cauterization					
UNIT - III		Lecture Hrs:10			
Introducing Review of the Literature – Methodology - Analysis of the Data-Findings - Discussion- Conclusions-Recommendations.					
UNIT - IV		Lecture Hrs:9			
Key skills needed for writing a Title, Abstract, and Introduction					
UNIT - V		Lecture Hrs:9			
Appropriate language to formulate Methodology, incorporate Results, put forth Arguments and draw Conclusions					
Suggested Reading					
<ol style="list-style-type: none"> 1. Goldbort R (2006) Writing for Science, Yale University Press (available on Google Books) Model Curriculum of Engineering & Technology PG Courses [Volume-I] 2. Day R (2006) How to Write and Publish a Scientific Paper, Cambridge University Press 3. Highman N (1998), Handbook of Writing for the Mathematical Sciences, SIAM. Highman'sbook 4. Adrian Wallwork , English for Writing Research Papers, Springer New York Dordrecht Heidelberg London, 2011 					



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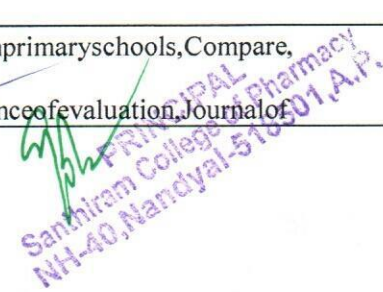


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M.PHARM. IN PHARMACEUTICS

COURSE STRUCTURE & SYLLABI

Course Code	PEDAGOGY STUDIES	L	T	P	C
21DAC201a			2	0	0
Semester		II			
Course Objectives: This course will enable students:					
<ul style="list-style-type: none"> • Review existing evidence on the review topic to inform programme design and policy making undertaken by the DfID, other agencies and researchers. • Identify critical evidence gaps to guide the development. 					
Course Outcomes (CO): Student will be able to					
Students will be able to understand:					
<ul style="list-style-type: none"> • What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries? • What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners? • How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy? 					
UNIT - I					
Introduction and Methodology: Aims and rationale, Policy back ground, Conceptual frame work and terminology Theories of learning, Curriculum, Teacher education. Conceptual framework, Research questions. Overview of methodology and Searching.					
UNIT - II					
Thematic overview: Pedagogical practices are being used by teachers in formal and informal classrooms in developing countries. Curriculum, Teacher education.					
UNIT - III					
Evidence on the effectiveness of pedagogical practices, Methodology for the in depth stage: quality assessment of included studies. How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy? Theory of change. Strength and nature of the body of evidence for effective pedagogical practices. Pedagogic theory and pedagogical approaches. Teachers' attitudes and beliefs and Pedagogic strategies.					
UNIT - IV					
Professional development: alignment with classroom practices and follow-up support, Peer support, Support from the head teacher and the community. Curriculum and assessment, Barrier to learning: limited resources and large class sizes					
UNIT - V					
Research gaps and future directions: Research design, Contexts, Pedagogy, Teacher education, Curriculum and assessment, Dissemination and research impact.					
Suggested Reading					
<ol style="list-style-type: none"> 1. Ackers J, Hardman F (2001) Classroom interaction in Kenyan primary schools, Compare, 31 (2): 245-261. 2. Agrawal M (2004) Curricular reforms in schools: The importance of evaluation, Journal of 					






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3. Curriculum Studies, 36 (3): 361-379.
4. AkyeampongK(2003) Teacher training in Ghana - does it count? Multi-site teachereducation research project (MUSTER) country report 1. London: DFID.
5. Akyeampong K, LussierK, PryorJ, Westbrook J (2013)Improving teaching and learning of basic maths and reading in Africa: Does teacherpreparation count?International Journal Educational Development, 33 (3): 272–282.
6. Alexander RJ(2001) Culture and pedagogy: International comparisons in primary education. Oxford and Boston: Blackwell.
- Chavan M (2003)ReadIndia: A mass scale, rapid, 'learning to read' campaign.
7. www.pratham.org/images/resource%20working%20paper%202.pdf.



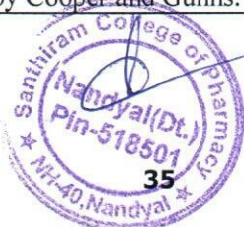

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**M.PHARM. IN PHARMACEUTICS
 COURSE STRUCTURE & SYLLABI**

Course Code	BIOLOGICAL SCREENING METHODS	L	T	P	C
21SOE301d	(Elective)	3	0	0	3
Semester		III			
Course Objectives:					
The students are going to study about various techniques for screening of drugs for various pharmacological activities and guide lines for handling animals and human and animal ethics for screening of drugs.					
Course Outcomes (CO): Student will be able to					
The expected outcomes are students will know how to handle animals and know about various techniques for screening of drugs for different pharmacological activities, guidelines and regulations for screening new drug molecules on animals.					
UNIT - I					
Drug discovery process: Principles, techniques and strategies used in new drug discovery. High throughput screening, human genomics, robotics and economics of drug discovery, Regulations. Alternatives to animal screening procedures, cell-line, patch –clamp technique, In-vitro models, molecular biology techniques					
UNIT - II					
Bioassays: Basic principles of bioassays, official bioassays, experimental models and statistical designs employed in biological standardization.					
UNIT - III					
Principles of toxicity evaluations, ED50, LD50 and TD values, International guidelines (ICH recommendations). Preclinical studies: General principles and procedures involved in acute, sub-acute, chronic, teratogenicity, mutagenicity and carcinogenicity					
UNIT - IV					
Screening of different classes of drugs using micro-organisms. Vitamin and antibiotic assays. Screening methods involved in toxins and pathogens.					
UNIT - V					
Enzymatic screening methods: α -glucosidase, α - amylase, DNA polymerase, nucleases, Lasparginase, lipases and peptidases.					
Reference Books:					
1. Basic and clinical pharmacology by Bertram G. Katzung (International edition) lange medical book / Mc Graw Hill, USA 2001 8th edition					
2. Pharmacology by Rang H.P, Dale MM and Ritter JM., Churchill Livingston, London, 4/e					
3. Goodman and Gilman's The pharmacological basis of therapeutics (International edition) Mc Graw Hill, USA 2001 10th edition.					
4. General and applid toxicology by B.Ballantyne, T.Marrs, P.Turner (Eds) The Mc Millan press Ltd, London.					
5. Drug Discovery by Vogel's					
6. Drug Discovery and evaluation – Pharmacological assays by H.Gerhard.Vogel, 2nd edition, Springer verlag, Berlin, Heidelberg.					
7. Tutorial Pharmacy (Vol I and II) by Cooper and Gunns.					




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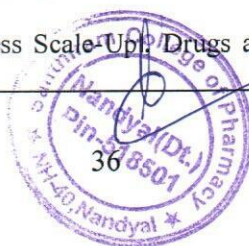


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M.PHARM. IN PHARMACOLOGY

COURSE STRUCTURE SYLLABI

Course Code	PHARMACEUTICAL VALIDATION	L	T	P	C
21SOE301a	(Elective)	3	0	0	3
Semester		III			
Course Objectives:					
The main purpose of the subject is to understand about validation and how it can be applied to industry and thus to improve the quality of the products. The subject covers the complete information about validation, types, methodology and application					
Course Outcomes (CO): Student will be able to					
<ul style="list-style-type: none"> • Explain the aspect of validation • Carryout validation of manufacturing processes • Apply the knowledge of validation to instruments and equipments • Validate the manufacturing facilities 					
UNIT - I					
Introduction: Definition of Qualification and Validation, Advantage of Validation, Streamlining of Qualification & Validation process and Validation Master Plan. Qualification: User Requirement Specification, Design Qualification, Factory Acceptance Test (FAT)/ Site Acceptance Test (SAT), Installation Qualification, Operational Qualification, Performance Qualification, Re- Qualification (Maintaining status -Calibration Preventive Maintenance, Change management), Qualification of Manufacturing Equipment, Qualification of Analytical Instruments and Laboratory equipments					
UNIT - II					
Qualification of analytical instruments: Electronic balance, pH meter, UV-Visible spectrophotometer, FTIR, GC, HPLC, HPTLC Qualification of Glassware: Volumetric flask, pipette, Measuring cylinder, beakers and burette.					
UNIT - III					
Qualification of laboratory equipments: Hardness tester, Friability test apparatus, tap density tester, Disintegration tester, Dissolution test apparatus. Validation of Utility systems: Pharmaceutical water system & pure steam, HVAC system, Compressed air and nitrogen.					
UNIT - IV					
Cleaning Validation: Cleaning Validation - Cleaning Method development, Validation and validation of analytical method used in cleaning. Cleaning of Equipment. Cleaning of Facilities. Cleaning in place (CIP).					
UNIT - V					
Analytical method validation: General principles, Validation of analytical method as per ICH guidelines and USP.					
Textbooks:					
<ol style="list-style-type: none"> 1. T. Loftus & R. A. Nash, "Pharmaceutical Process Validation", Drugs and Pharm Sci. Series, Vol.129, 3rd Ed., Marcel Dekker Inc., N.Y. 2. The Theory & Practice of Industrial Pharmacy, 3rd edition, Leon Lachman, Herbert A. Lieberman, Joseph. L. Karig, Varghese Publishing House, Bombay. 3. Validation Master plan by Terveeks or Deeks, Davis Harwood International publishing. 4. Validation of Aseptic Pharmaceutical Processes, 2nd Edition, by Carleton & Agalloco, (Marcel Dekker). 5. Michael Levin, Pharmaceutical Process Scale-Up, Drugs and Pharm. Sci. Series, Vol. 157, 2nd Ed., Marcel Dekker Inc., N.Y. 					



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