



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 (2023-2024)



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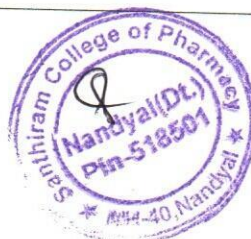
1.2.1 Number of Programmes in which Choice Based Credit System (CBCS)/ elective course system has been implemented

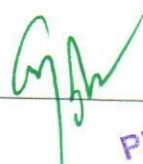
1.2.1.1 - Number of Programmes in which CBCS/ Elective course system implemented -01 (Academic Year 2023-24)

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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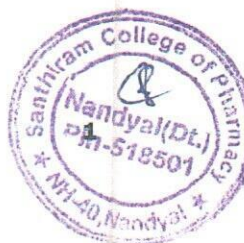
M.PHARM. IN PHARMACEUTICS
COURSE STRUCTURE & SYLLABI

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.	21DAC101a 21DAC101b 21DAC101c	Audit Course – I English for Research paper writing Disaster Management Sanskrit for Technical Knowledge	2	-	-	0
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.	21DAC201a 21DAC201b 21DAC201c	Audit Course – II Pedagogy Studies Stress Management for Yoga Personality Development through Life Enlightenment Skills	2	-	-	0
8.	21S03207	Seminar/Assignment	-	1	6	4
Total			18	1	18	26



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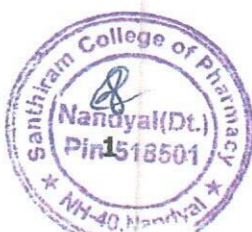
COURSE STRUCTURE & SYLLABI

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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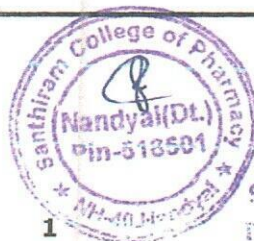
COURSE STRUCTURE & SYLLABI

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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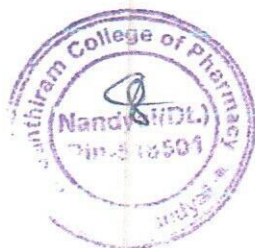
COURSE STRUCTURE & SYLLABI


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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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.		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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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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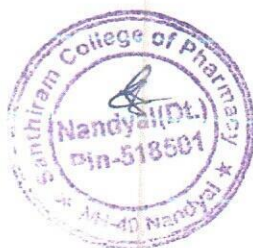
COURSE STRUCTURE SYLLABI

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.	21SOE301a	Open Elective Pharmaceutical Validation	3	-	-	3
	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			30	18
		Total	5		30	20




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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			
IOverview 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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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 reform in schools: The importance of evaluation, Journal of 					



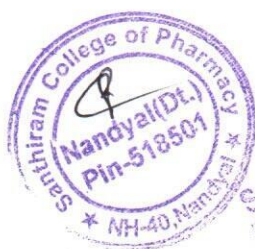
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3. Curriculum Studies, 36 (3): 361-379.
4. AkyeampongK(2003) Teacher training in Ghana - does it count? Multi-site teachereducation research project (MUSTER) country report 1. London: DFID.
5. Akyeampong K, LussierK, PryorJ, Westbrook J (2013)Improving 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.



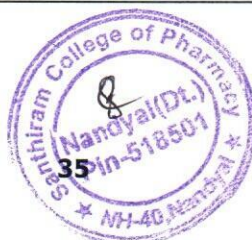
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COURSE STRUCTURE & SYLLABI

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, Laspariginase, 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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 NH-40, Nandyal-518501, A.P.

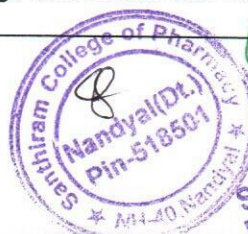


JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

M.PHARM. IN PHARMACOLOGY

COURSE STRUCTURE SYLLABI

Course Code	PHARMACEUTICAL VALIDATION (Elective)	L	T	P	C
		21SOE301a	3	0	0
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-Upl, Drugs and Pharm. Sci. Series, Vol. 157, 2nd Ed., Marcel Dekker Inc., N.Y. 					



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