Dr. D. Y. Patil Pratishthan's
Dr. D. Y. PATIL COLLEGE OF PHARMACY
Dr. D. Y. Patil Educational Complex, Sector - 29, Pradhikaran, Akurdi, Pune 411 044.
Tel. : 020-27656141, Tel. Fax : 020-27656141
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Approved by : All India Council for Techinical Education, New Delhi
Pharmacy Council of India, New Delhi. Recognized by : Government of Maharashtra
Affiliated to Savitribai Phule Pune University, Pune

Dr. Sanjay D. Patil
President

Padmashree Dr. D. Y. Patil
Founder

Shri. Satej D. Patil
Vce-President & Chairman

Dr. N. S. Vyawahare
Principal

2.6.1
Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the institution are stated and displayed on website

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The course objectives of all courses are mentioned in the curriculum prescribed by the University. Each subject teacher has designed course outcomes (Cos) for theory and practical based on the number of units/ practical's in curriculum ranging between 4-8 and Teaching Learning outcomes (TLOs) are framed as per lectures/ practical's conducted. All Course outcomes and Programme outcomes are of all programmes are appropriately disseminated on website and conveyed to the students during lectures.

Summary

Sr. No.	Content	Documents
1.	Programme Outcomes	View Documents
2.	Sample copy of Course outcomes prepared by Subject teacher	View Documents
3.	Dissemination of Course Outcomes	View Documents
4.	Dissemination of Programme Outcomes	View Documents
5.	Sample copy of Question paper Designed and mapped with Course outcomes and Programme outcomes	View Documents

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Akurdi, Pune-411044

PROGRAMME OUTCOMES

1. **Pharmacy Knowledge:** Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices.
2. **Planning Abilities:** Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
3. **Problem analysis:** Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.
4. **Modern tool usage:** Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
5. **Leadership skills:** Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well- being.
6. **Professional Identity:** Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
7. **Pharmaceutical Ethics:** Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
8. **Communication:** Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
9. **The Pharmacist and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.

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10. **Environment and sustainability:** Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

11. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self- assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

PO1	**Pharmacy Knowledge**
PO2	**Planning Abilities**
PO3	**Problem analysis**
PO4	**Modern tool usage**
PO5	**Leadership skills**
PO6	**Professional Identity**
PO7	**Pharmaceutical Ethics**
PO8	**Communication**
PO9	**The Pharmacist and society**
PO10	**Environment and sustainability**
PO11	**Life-long learning**

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Sample copy of Course outcomes prepared by Faculty

SYLLABUS PLAN

Theory/Practical: Theory

Subject code: BP 502 T

Subject: Industrial Pharmacy-I

Class: Third year

Semester: V

No of Hrs. assigned: 4Hrs/week

No of hours planned : 45

Department: Pharmaceutics

Course Description: Course enables the student to understand and appreciate the influence of pharmaceutical additives and various pharmaceutical dosage forms on the performance of the drug product. Industrial Pharmacy is a discipline which includes manufacturing, development, marketing and distribution of drug products including quality assurance of these activities. This broad research area relates to different functions in the pharmaceutical industry and having contact areas with engineering and economics.

Course Objectives:

Upon completion of the course the student shall be able to

1. Illustrate various pharmaceutical dosage forms and their manufacturing techniques.
2. Describe various factors to be considered in development of pharmaceutical dosage forms
3. Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality

Course Outcomes:

CO1: Assess the physicochemical properties of drugs as a tool in the optimization of solid and liquid dosage forms.

CO2: Formulate and evaluate tablets, and liquid orals using established procedures and technology.

CO3: Formulate and evaluate capsules and pallets using established procedures and technology.

CO4: Appraise the formulation and evaluation of different types of parenteral and ophthalmic dosage forms with their packaging considerations.

CO5: Formulate and evaluate cosmetics and Aerosols based on their role with the packaging system.

CO6: Select and evaluate appropriate packaging materials for various pharmaceutical dosage forms.

TEACHING LEARNING OUTCOMES

Chapter No.	Name of the Chapter	Co mapped	Teaching Learning outcomes
1	Preformulation	CO1	502.1 Discuss introduction to preformulation goals and objectives, Drug discovery process
			502.2 Explain solid state properties- bulk characterization
			502.3 Explain Liquid state properties-solubility studies
2	Tablets	CO2	502.4 Discuss the introduction and types of tablets
			502.5 Discuss the types of tablets continued
			502.6 Explain the additives used in tablets
			502.7 Appraise the knowledge of granulation mechanism and processes
			502.8 Evaluate of granulation
			502.9 Justify the physics of tablet compression
			502.10 Explain tablet compression machines
			502.11 Summarize the manufacturing problems and remedies thereof.
			502.12 Elaborate Quality control for tablets
			502.13 Discuss Packaging and labeling strips, blister and bulk packaging
3	Tablet coating	CO2	502.14 Explain Advantages and disadvantages, Types of coating , ideal properties for coating
			502.15 Describe Sugar coating process
			502.16 Discuss Film coating and enteric coating process
			502.17 Elaborate Materials used for film coating and enteric coating
			502.18 Explain Process parameters affecting coating
			502.19 Discuss Manufacturing problems and remedies thereof.
			502.20 Explain Compression Coating Evaluation of coated tablets
4	Pelletization	CO3	502.21 Discuss introduction, formulation requirements of Pellets
			502.22 Explain Pelletization process, equipments for manufacture of pellets
			502.23 Describe Evaluation of pellets
5	Capsules	CO3	502.24 Discuss Advantages and disadvantages of capsules, Raw material for capsule shell
			502.25 Elaborate preparation of hard capsule shell
			502.26 Explain study of Capsule sizes and standards and defects thereof
			502.27 Discuss Formulation development
			502.28 Explain Capsule filling principles and equipments
			502.29 Describe Q.C Parameters problems and remedies thereof.

			502.30 Discuss Soft gelatin capsule formulation development
			502.31 Elaborate Manufacturing , processing and equipment
			502.32 Outline Plant layout of Capsule Manufacturing plant
6	Liquid orals:	CO2	502.33 Discuss Preformulation of liquid orals
			502.34 Formulation and manufacturing consideration of syrups and elixirs
			502.35 Explain Suspension theories
			502.36 Describe Suspensions formulation and evaluation
			502.37 Explain Emulsion theories
			502.38 Discuss Emulsion formulation and evaluation
7	Cosmetics	CO5	502.39 Introduction to cosmetics & their classification
			502.40 Discuss preparation and evaluation shampoos
			502.41 Discuss preparation and evaluation of lipsticks
			502.42 Discuss preparation and evaluation cold cream and vanishing cream
			502.43 Discuss preparation and evaluation tooth pastes
			502.44 Discuss preparation and evaluation hair dyes
			502.45 Discuss preparation and evaluation sunscreens
8	Aerosol	CO5	502.46 Definition, propellants containers, valves, types of aerosol systems
			502.47 Discuss preformulation, formulation and manufacture of aerosols
			502.48 Explain Evaluation of aerosols; Quality control and stability studies.
9	Parenteral Products	CO4	502.49 Describe definition, types, advantages and limitations. Preformulation factors and essential requirements, vehicles, additives, importance of isotonicity of Parenteral products.
			502.50 Discuss production procedure, production facilities and controls, aseptic processing
			502.51 Formulation of injections, sterile powders, large volume parenterals and lyophilized products.
			502.52 Discuss containers and closures selection, filling and sealing of ampoules, vials and infusion fluids.
			502.53 Explain Quality control tests of parenteral products.
10	Ophthalmic Preparations:	CO4	502.54 Explain formulation considerations of ophthalmic preparations
			502.55 Discuss formulation, methods of preparation, labeling, containers; evaluation of ophthalmic preparations
11	Packaging Materials Science:	CO6	502.56 Explain materials used for packaging of pharmaceutical products,
			502.57 Discuss factors influencing choice of containers, legal and official requirements for

			containers, 502.58 Explain stability aspects of packaging materials, quality control tests

Ms. N. Kaushal Subject Teacher	Dr. S. P. Chaudhari HOD	Dr. S. P. Chaudhari Academic Coordinator	Dr. N. S. Vyawahare Principal

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Subject: Pharmacognosy & Phytochemistry –II **Class:** S.Y.B.Pharm

Subject code:2.4.5 T

Course description:

Pharmacognosy and Phytochemistry-II deals with the evolutionary significance of the alkaloid and terpenoid formation in the plants and understand the medicinal significance of these molecules.

Course outcomes related to knowledge, cognitive skills & attitude:

on completion of following theory topics, learner should be able to:

2.4.5.1 Elaborate the concept of metabolites.

2.4.5.2 Summarise the pharmacognostic study of various categories of metabolites.

2.4.5.3 Determine extracted metabolites by quantitative method.

2.4.5.4 Analyse the qualitative aspects of crude drugs.

2.4.5.5 Deduce the use of marketed derivatives of alkaloids.

2.4.5.6 Explain the industrial applications of secondary metabolites

Course learning outcome related to knowledge, skill and attitude:

By the end of this course, the student will be able to:

2.4.5.1 Demonstrate skill of plant material sectioning, staining, mounting & focusing.

2.4.5.2. Identify the parts of plants from its morphological & microscopical features by applying experimental & theoretical knowledge of morphology & anatomies obtained in theory classes and draw the same.

2.4.5.3. Conduct extractions/isolations & explain significance of use of various chemicals & physical conditions.

2.4.5.4. Conduct various analytical parameters of volatile oils & judge the quality of volatile oils.

Chapter	Topic	Teaching Learning outcomes related to Knowledge and cognitive skills
On completion of theory student will be able to		
1.	Alkaloids	2.4.5.1 Define and classify alkaloids 2.4.5.2 Explain the occurrence, properties and nomenclature of alkaloids 2.4.5.3 Explain the chemistry including biogenesis, qualitative/ quantitative analysis. 2.4.5.4 Describe the pyridine-piperidine alkaloid alongwith highlight on tobacco plant 2.4.5.5 Describe the tropane alkaloid alongwith highlight on Belladonna plant 2.4.5.6 Discuss the pharmacognostic profile of Datura plant 2.4.5.7 Discuss the pharmacognostic profile of Coca plant 2.4.5.8 Describe the Quinoline&Isoquinoline alkaloid 2.4.5.9 Discuss the pharmacognostic profile of Cinchona plant 2.4.5.10 Discuss the pharmacognostic profile of Ipecac plant 2.4.5.11 Discuss the pharmacognostic profile of Opium plant 2.4.5.12 Discuss the pharmacognostic profile of Opium plant 2.4.5.13 Describe the Indole alkaloid 2.4.5.14 Discuss the pharmacognostic profile of Ergot plant 2.4.5.15 Discuss the pharmacognostic profile of Rauwolfia plant 2.4.5.16 Discuss the pharmacognostic profile of Catharanthus plant 2.4.5.17 Discuss the pharmacognostic profile of Nux-vomica seed

		2.4.5.18 Describe the Imidazole alkaloid alongwith highlight on Pilocarpus plant 2.4.5.19 Describe the Steroidal alkaloid 2.4.5.20 Discuss the pharmacognostic profile of Veratrum plant 2.4.5.21 Discuss the pharmacognostic profile of Kurchi plant 2.4.5.22 Describe the Alkaloidal amine alkaloid 2.4.5.23 Discuss the pharmacognostic profile of Ephedra plant 2.4.5.24 Discuss the pharmacognostic profile of Colchicum plant 2.4.5.25 Describe the Glycoalkaloidalongwith highlight on Solanum plant species 2.4.5.26 Describe the Purine alkaloid alongwith highlight on Coffee plant 2.4.5.27 Discuss the pharmacognostic profile of Tea plant
2.	Terpenoids& Resins	2.4.5.28 Define and classify the different trepenoids 2.4.5.29Explain the occurrence, physicochemical properties and nomenclature of terpenoids 2.4.5.30 Explain the general biogenisis and qualitative/ quantitative analysis of terpenoids 2.4.5.31 Discuss the Lower terpenoidsalongwith a major focus on Clove plant. 2.4.5.32 Explain the pharmacognostic profile of Cinnamon plant 2.4.5.33 Explain the pharmacognostic profile of Coriander plant 2.4.5.34 Explain the pharmacognostic profile of Lavender plant 2.4.5.35 Explain the pharmacognostic profile of Sandal wood plant 2.4.5.36 Explain the pharmacognostic profile of Artemesia plant 2.4.5.37 Discuss the Diterpenoidsalongwith a major focus on Taxus plant. 2.4.5.38 Explain the pharmacognostic profile of Coleus plant 2.4.5.39 Discuss the Triterpenoidsalongwith a major focus on Ginseng plant. 2.4.5.40 Discuss the Tetraterpenoidsalongwith a major focus on Annato plant. 2.4.5.41 Explain the pharmacognostic profile of Saffron plant 2.4.5.42Define and classify resins 2.4.5.43 Explain its physicochemical properties and qualitative/ quantitative analysis 2.4.5.44 Explain the pharmacognostic profile of Podophyllum&Guggul plant 2.4.5.45 Explain the pharmacognostic profile of Boswellia& Cannabis plant

Note: The evaluation of the students will be made on the basis of

1. Assignment
2. Quiz or Multiple choice questions test,
3. Pretest including short and extended questions,
4. Mid-term examination, and
5. Final examination.

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Subject: Pharmacognosy & Phytochemistry –II **Subject code:**2.4.5P		**Class:** S.Y.B.Pharm
Practical No	**Type of Practical**	**Course learning outcome related to knowledge, skill and attitude**
On completion of practical course student will be able to-		
1.	Study of Crude drugs morphology, microscopy& powdered characteristics of crude drugs	2.4.5. 1.P- Identify the given unknown crude drug based on morphological, microscopical characters, chemical / histochemical tests for following crude drugs in entire and in powdered form- Rauwolfia 2.4.5.2. P- Identify the given unknown crude drug based on morphological, microscopical characters, chemical / histochemical tests for following crude drugs in entire and in powdered form- Cinchona, Kurchi 2.4.5.3.P- Identify the given unknown crude drug based on morphological, microscopical characters, chemical / histochemical tests for following crude drugs in entire and in powdered form- Ephedra 2.4.5.4.P- Identify the given unknown crude drug based on morphological, microscopical characters, chemical / histochemical tests for following crude drugs in entire and in powdered form- Nux-vomica
2.	To determine the solubility, specific gravity of the given volatile oil samples.	2.4.5.5.P- Identify the solubility of volatile oil 2.4.5.6.P- Identify the specific gravity of the given volatile oil
3.	Extraction, Isolation, evaluation by chromatography	2.4.5.7.P- Extract and analyse Caffeine on the basis of TLC 2.4.5.8.P- Extract and analyseEugenol on the basis of TLC
4.	Determination of volatile oil content	2.4.5.9.P- Determine and analyse (TLC analysis) volatile oil content by Clevenger apparatus (Mentha and Eucalyptus oil)
5.	Identification of unorganized crude drugs.	2.4.5.10.P- Explain various folklore drugs along with its morphological characters

Note: The evaluation of the students will be made on the basis of Four components:

1. Lab notebook. Each report in the lab notebook will be graded based on the following criteria: organization, Discussing of the experiment, clearness, completeness, readability and internal coherence.
2. Global laboratory skills. In each experiment the level of performance will be assessed considering care on formulation and evaluation of the experiment/preparation, housekeeping, attendance and punctuality.
3. Type of container selected and label of the product.
4. Final oral examination.

Ms. S. W. Jadhav
Subject Teacher

Dr. R. S. Karodi
HOD

Dr. S. P. Chaudhari
Academic Coordinator

Dr. N. S. Vyawahare
Principal

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Akurdi,Pune 411044
Institute code-635

Term Plan M Pharm Sem –I 2021-2022

Subject: Modern Pharmaceutics(T) | Subject Code:MPH103(T)
Name of the Faculty: Mrs. Shilpa. P. Chaudhari | H.O.D: Dr.(Mrs) S.P.Chaudhari
Probable Hours Available: 45 hrs | Extra Lectures Planned: Nil
Total Lectures Planned: 45 | Tutorial Sessions available 15hrs
Planning for tutorial Sessions: 15hrs | Total Sessions planned: 45+15=60

Course Description: Course designed to impart advanced knowledge and skills required to learn various aspects and concepts at pharmaceutical industries

- Course Outcome: Upon completion of the course, student will be able to

CO1 State and perform various elements of preformulation studies.
CO2 Differentiate between the Compaction, compression and consolidation parameters
CO3 Imbibe the Industrial Management and GMP Considerations.
CO4 Practice the Optimization Techniques & Pilot Plant Scale Up Techniques
CO5 Validate and evaluate various Processes , dosage forms and equipments.
CO6 Estimate dissolution, diffusion and pharmacokinetic parameters from Pharmaceuticals point of view.

	Knowledge	Planning	Problem Solving	Modern tool usage	Leader ship	Professional identity	Ethics	Commun ication	Pharmacist and society	Environment and sustainability	Life long learning
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	2					1	1	2	2
CO2	3	2	2	2	2	2		2		2	2
CO3	3	1	2	3	2	3	3	2	2	3	2
CO4	3	2	2	3	2	3	3	3	2	1	2
CO5	3	2	2	3	2	3	3	2	2	2	3
CO6	3	3	3	3	3	3	3	3	1	1	2

Books Referred:

1 Leon Lachman; Liberman A. Herbert; Joseph L Kanig; "The theory and Practice of Industrial Pharmacy"; 3rd edition; Varghese Publishing house, Dadar;412-430,804-834
2. Herbert A . Liberman; Leon Lachman; Joseph B.Schwartz; " Pharmaceutical Dosage forms: Tablets" Volume 1 ; 2nd edition; Marcel Dekkar series ; .1-69
3. Herbert A . Liberman; Leon Lachman; Joseph B.Schwartz; " Pharmaceutical Dosage forms: Tablets" Volume 2 ; 2nd edition; Marcel Dekkar series ; 201-241
4. Herbert A . Liberman; Leon Lachman; Joseph B.Schwartz; " Pharmaceutical Dosage forms: Tablets" Volume 3 ; 2nd edition; Marcel Dekkar series ;
5. Larry L .Augsburger; Stephen W.Hoag ; "" Pharmaceutical Dosage forms: Tablets" Volume 1: Unit Operatiuons and mechanical Properties; 3rd edition;informa healthcare New York London; 465-484, 555-619.
6. Larry L .Augsburger; Stephen W.Hoag ; "" Pharmaceutical Dosage forms: Tablets" Volume 2: Rational Design and formulation; 3rd edition;informa healthcare New York London;
7. Larry L .Augsburger; Stephen W.Hoag ; "" Pharmaceutical Dosage forms: Tablets" Volume 3: Manufacture and process control; 3rd edition;informa healthcare New York London;,
8. Herbert A . Liberman;Martin M Riger; Gilbert S. Banker; "Pharmaceutical Dosage forms: Disperse Systems";Volume 1;2nd edition; Marcel Dekkar series: 17-43

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Session wise TLO

Chapter No.	Name of the Chapter	No.	Teaching Learning Outcomes chapter wise
1	Preformulation- CO-1 State and perform various elements of preformulation studies	1.	Discuss the Concept of Preformulation with respect to solubility and stability of dosage form
		2.	Plan the preformulation studies for Bulk characterization/Solubility studies/stability studies of API
		3.	Based on properties of API and excipient formulate the dosage form Describe the selection of Emulsifiers based on RHLB calculations
		4.	Demonstrate the use of various equipments in the formulation and evaluation of dosage forms
		5.	Argue for the selection of excipients and formulation design in dosage formulation
		6.	Formulate and evaluate the dosage form using sophisticated Equipment s
		7.	Evaluate the dosage form as per Pharmacopeial guidelines
		8.	Perform and interpret Compatibility between various formulation ingredients using FTIR and DSC
		9.	Discuss the rationale behind formulation of dosage form
		10.	Discuss the formulation layout as per C GMP guidelines
		11.	Explore the newer excipients for selection in Dosage forms
2.	Validation CO5 Validate and evaluate various Processes , dosage forms and equipments	12	Signify the need of validation along with role of each personnel involved in validation
		13	Compare between types of process validation
		14	Differentiate between ICH and WHO guidelines for Calibration and validation.
		15	Define and differentiate between Process and equipment validation
		16	Explain validation of Any one dosage form
		17	Calculate the challenges in tech transfer from lab to pilot plant
		18	Validate any one Pharmaceutical equipment in detail
3.	cGMP & Industrial Management CO3 Imbibe the Industrial Management and GMP Considerations	19	Reflect Practice c-GMP during dosage form manufacturing
		20	Practice Total Quality management in product development
		21	Discuss in brief the process of production management.
		22	Draw the layout of Building of Pharmaceutical industry area wise
		23	Write a note on sales forecasting
		24	Discuss interpersonal and industrial relationship
		25	Explain the methods of budget and cost control in production
		26	Practice inventory management and control
		27	Explain material management
4.	Compression and compaction: CO2 Differentiate between the Compaction, compression and consolidation parameters	28	Define and differentiate between compaction , compression and consolidation with suitable example
		29	Draw and interpret various compaction profiles with suitable examples
		30	Give significance of Heckal and Kawakita analysis
		31	Discuss different types of deformation taking place during compaction.
		32	Explain solubility phenomenon in relation to activity coefficient and gibbs free energy.
		33	Discuss in brief force distribution mechanism with its significance
		34	Explain in detail Physics of tablet compression
		35	Explain effect of Friction during compression of tablet
5.	Dissolution and diffusion CO6 Estimate dissolution, diffusion and pharmacokinetic parameters from	36	Compare between Dissolution and diffusion
		37	Discuss various dissolution models in interpretation of release profile of drug
		38	Practice the concept of similarity factor in vitro release profile
		39	Define and differentiate between Pharmacokinetic and Dissolution parameters
		40	Significance of statistics in Pharmaceuticals

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	Pharmaceutica ls point of view		
6	Optimization CO4 Practice the Optimizatio n Techniques & Pilot Plant Scale Up Techniques	41	Discuss the concept of optimization
		42	Explain different methods of optimization in detail
		43	Describe the selection process of design so as to optimize the formulation with minimum run l
		44	Optimize the formulation using design expert software
		45	Demonstrate the role of software parameters in optimization
		46	List and Practice dependent variables for different dosage forms required during analysis of formulation development.
		47	Reflect the ethical behavior during analysis of result while using software
		48	Interpret the observations obtained from use of software during optimization
		49	Signify the role of optimization in formulation development during pandemic
		50	Signify how use of optimization technique contribute to environment and sustainability
		51	Inculcate new technologies and recent development in optimization during formulation development

Faculty In – Charge
Dr. S. P. Chaudhari

HOD
Dr. S. P. Chaudhari

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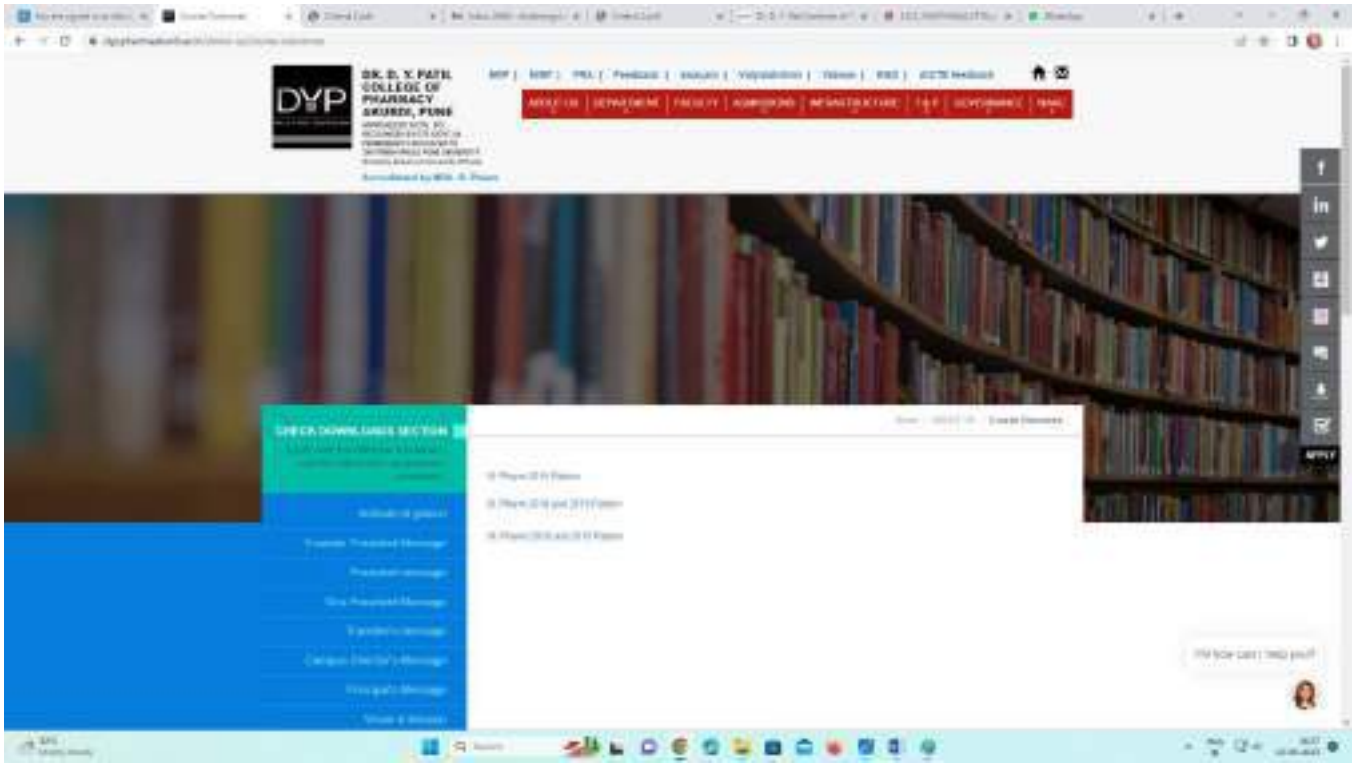
Ref. No. : DYPCOP/
Date :

Dissemination of Course Outcomes

Dissemination of Course outcomes

1. College Website



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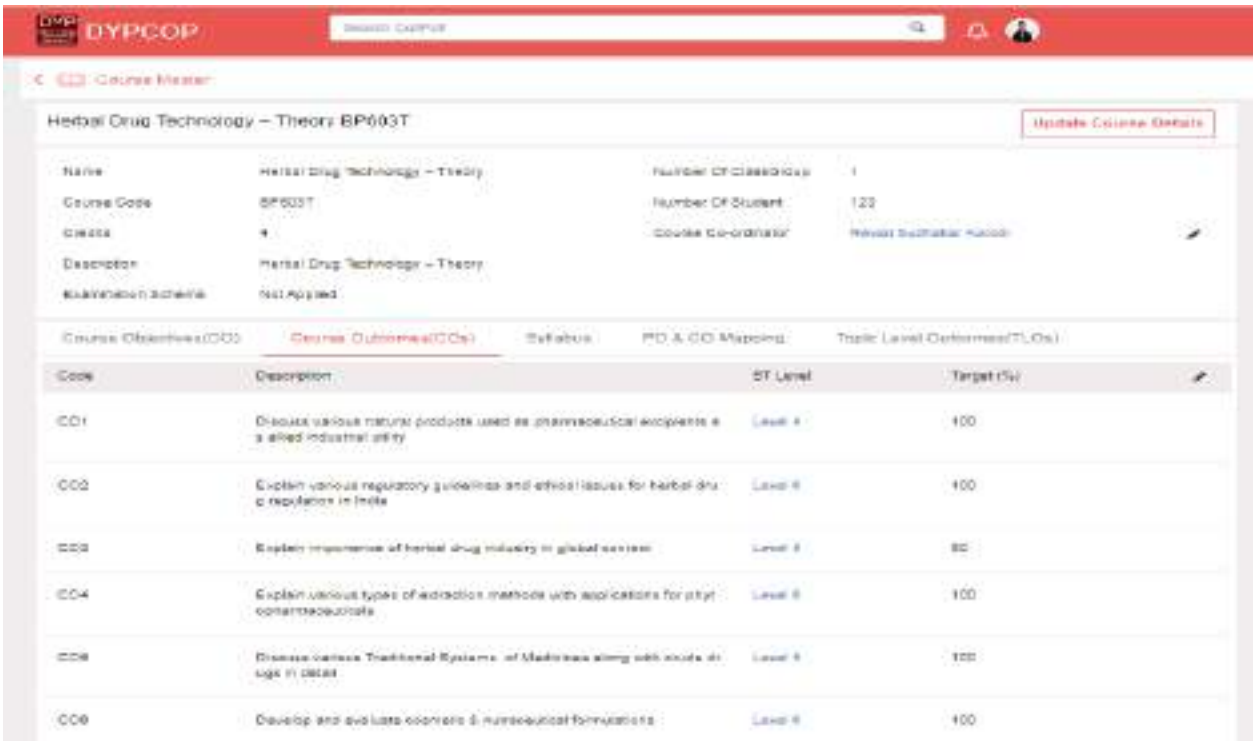

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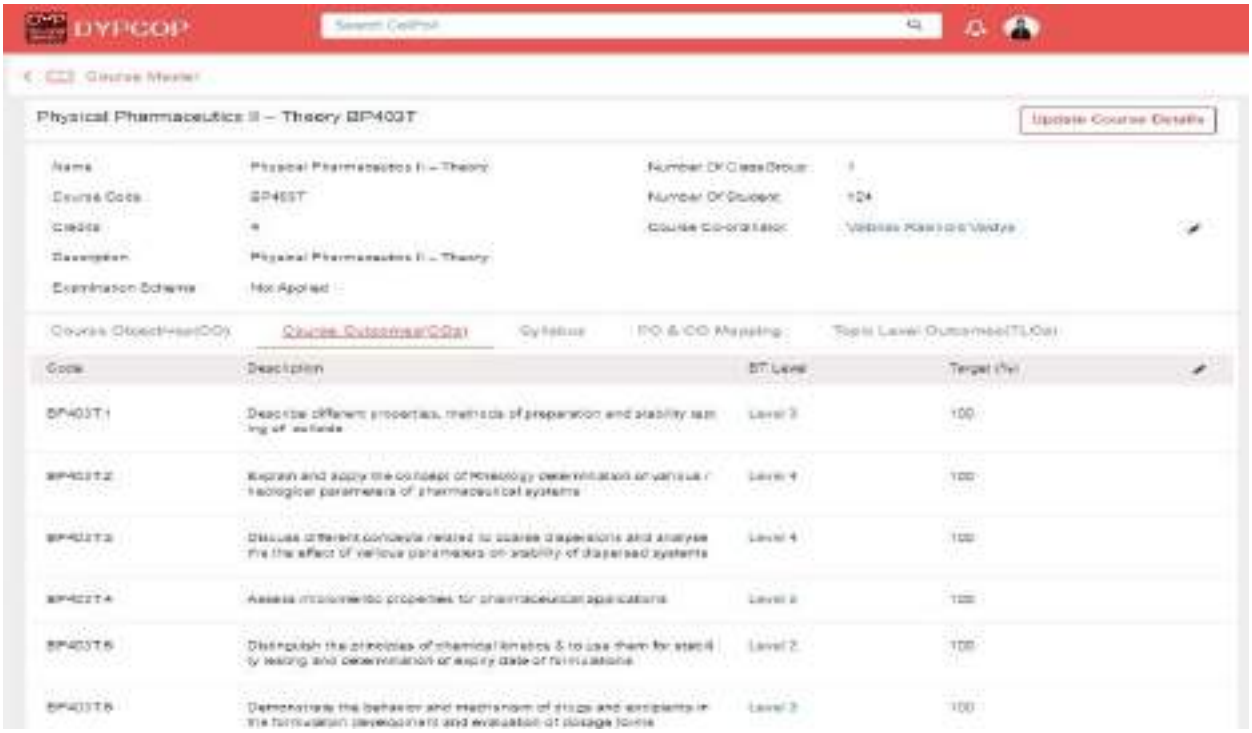

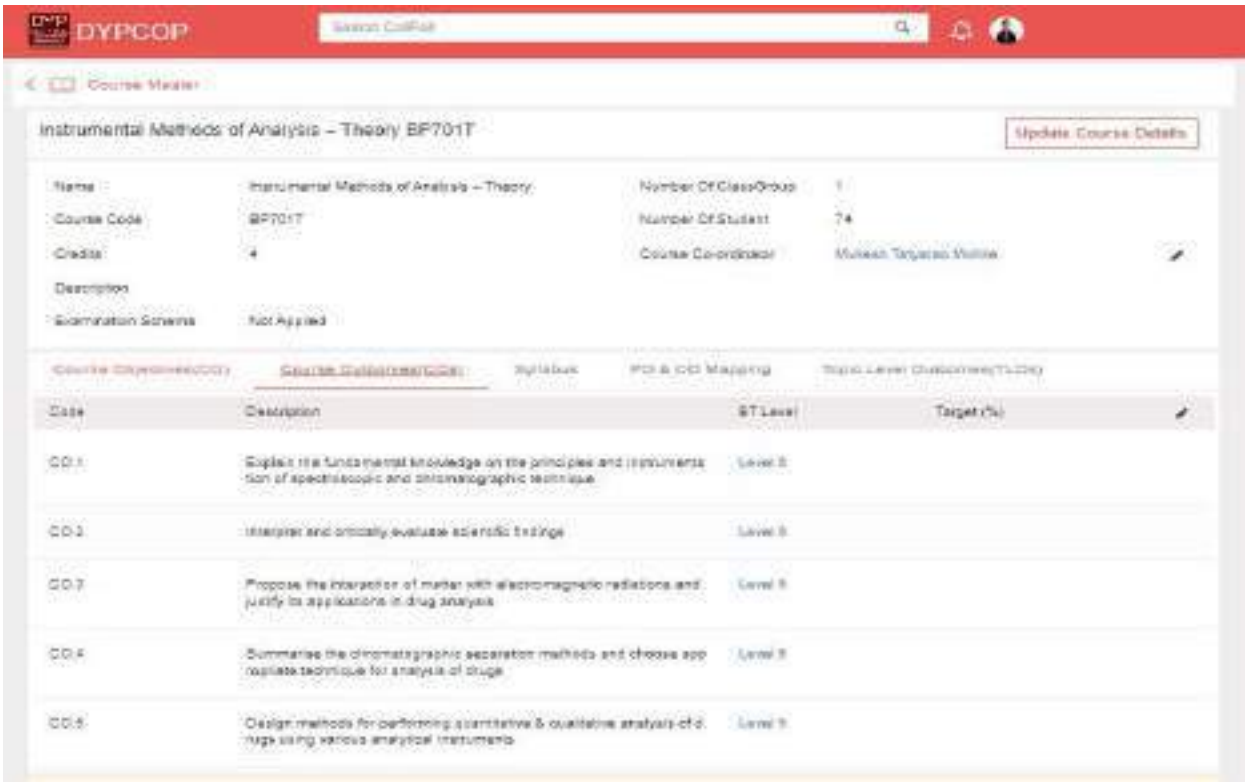

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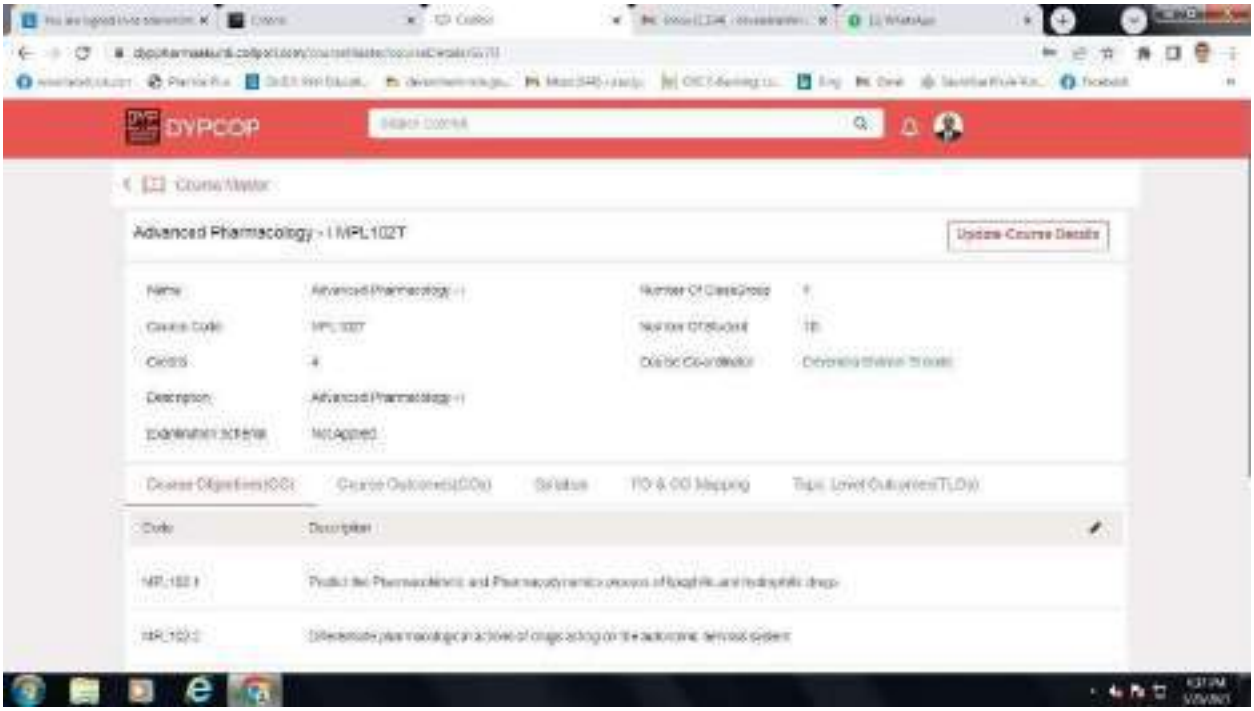

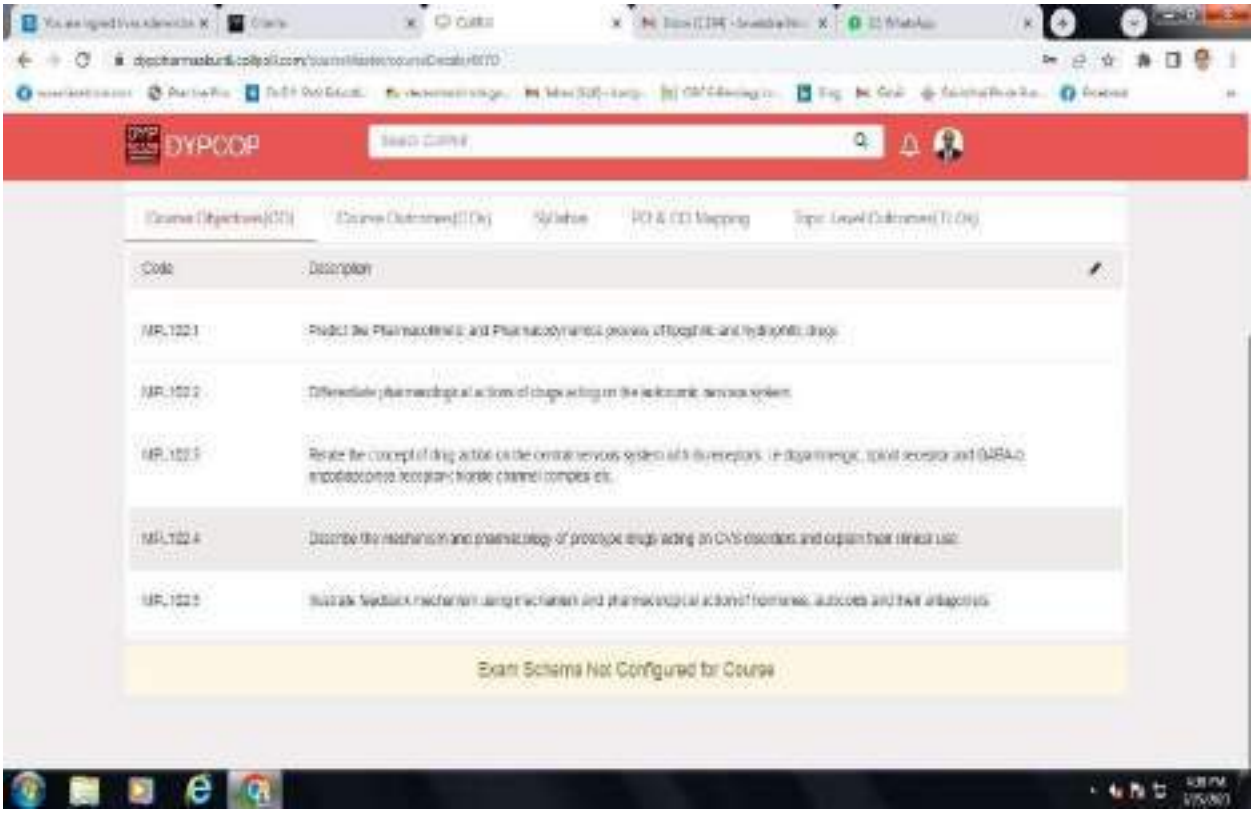

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3. Journal:

List of Books:

1. Organic Chemistry by Morrison and Boyd
2. Organic Chemistry by I.L. Finar, Volume-I
3. Textbook of Organic Chemistry by B. S. Bahl & Arun Bahl
4. Organic Chemistry by P. L. Soni
5. Practical Organic Chemistry by Mannard Saunders
6. Vogel's text book of Practical Organic Chemistry
7. Advanced Practical organic chemistry by N. K. Vishnoi.
8. Introduction to Organic Laboratory techniques by Pavia, Lampmanand Kriz.
9. Reaction and reaction mechanism by Ahluwaliah /Chatwal.

Course Outcomes:

CO1- Elaborate various concepts of organic chemistry

CO2- Summarize the structure, nomenclature, uses and type of Isomerism of the organic compounds.

CO3- Elaborate reactions, Name reactions, its mechanism and orientation of reactions, its different classes of organic compounds.

CO4- Elaborate account for / Stability of compounds.

CO5- Prepare and examine various organic compounds.

CO6- Construct molecular models and novel advancements in organic chemistry.

Program Outcomes:

1) Pharmacy knowledge 2) Planning ability 3) Problem analysis 4) Modern tool usage 5) Leadership skills 6) Professional Identity 7) Pharmaceutical Ethics 8) Communication 9) The Pharmacist and Society 10) Environment and sustainability 11) Life-Long learning

Course Outcomes from Physical Pharmaceutics II

On completion of course student will be able to:

1. Relate various physicochemical properties of drug and excipient molecules in designing the dosage forms
2. Distinguish the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
3. Demonstrate the behavior and mechanism of drugs and excipients in the formulation development and evaluation of dosage forms.
4. Evaluate different physicochemical properties of drug molecule
5. Compare between different types of of dispersion with respect to their stability
6. Select viscosity modifier to create and modify flow patterns in liquid formulation

Program Outcomes

1) Pharmacy Knowledge 2) Planning ability 3) Problem analysis 4) Modern tool usage 5) Leadership skills 6) Professional identity 7) pharmaceutical Ethics 8) communication 9) pharmacist and society 10) environment and sustainability 11) lifelong learning

Title of Experiment	Course outcome mapped	Program outcomes Mapped
Determination of particle size, particle size distribution using sieving method.	CO1, CO3, CO5	PO1,PO2,PO3,PO5,PO7,PO8,PO 11
Determination of particle size, particle size distribution using Microscopic method	CO1, CO3, CO5	PO1,PO2,PO3,PO5,PO7,PO8,PO 11
Determination of bulk density, true density and porosity.	CO1, CO3, CO5	PO3,PO7,PO3,PO5,PO7,PO8,PO 11
Determination of angle of repose and influence of lubricant on angle of repose	CO1, CO3, CO5	PO1,PO2,PO3,PO5,PO7,PO8,PO 11
Determination of viscosity of liquid using Ostwald's viscometer	CO1, CO3, CO5, CO6	PO3,PO2,PO3,PO5,PO7,PO8,PO 11
Determination of sedimentation volume with effect of different suspending agent	CO1, CO3, CO5, CO6	PO1,PO2,PO3,PO5,PO7,PO8,PO 11
Determination of sedimentation volume with effect of different concentration of single suspending agent.	CO1, CO3, CO5, CO6	PO1,PO2,PO3,PO5, PO6,PO7,PO8,PO11
Determination of viscosity of semisolid by using Brookfield viscometer.	CO1, CO3, CO5, CO6	PO1,PO2,PO3, PO4, PO5, PO6,PO7,PO8,PO11
Determination of reaction rate constant first order.	CO2	PO1,PO2,PO3,PO5,PO6,PO7,PO 8, PO11
Determination of reaction rate constant second order.	CO2	PO1,PO2,PO3,PO5,PO7,PO8,PO 11
Accelerated stability studies.	CO2	PO1,PO2,PO3,PO5,PO7,PO8,PO 11
Determination of Cloud point and Krafft point of given surfactant	CO5	PO1,PO2,PO3,PO5,PO7,PO8,PO 11
Determination of effect of salts on stability of hydrophobic sols.	CO5	PO1,PO2,PO3,PO5,PO7,PO8,PO 11

4. Lab Display:

Back to Summary

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Tel. : 020-27656141, Tel. Fax : 020-27656141
E-mail : info@dyppharmaakurdi.ac.in Web : www.dyppharmaakurdi.ac.in
Approved by : All India Council for Techinical Education, New Delhi
Pharmacy Council of India, New Delhi. Recognized by : Government of Maharashtra
Affiliated to Savitribai Phule Pune University, Pune

Dr. Sanjay D. Patil
President

Padmashree Dr. D. Y. Patil
Founder

Shri. Satej D. Patil
Vce-President & Chairman

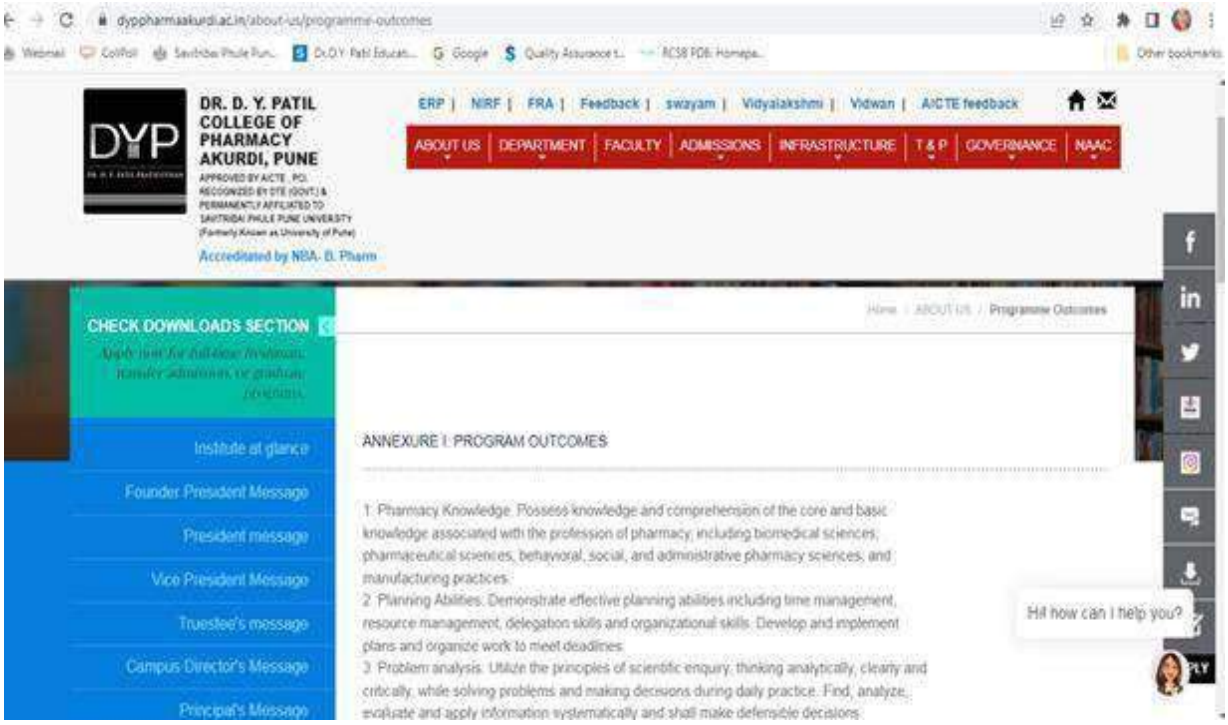
Dr. N. S. Vyawahare
Principal

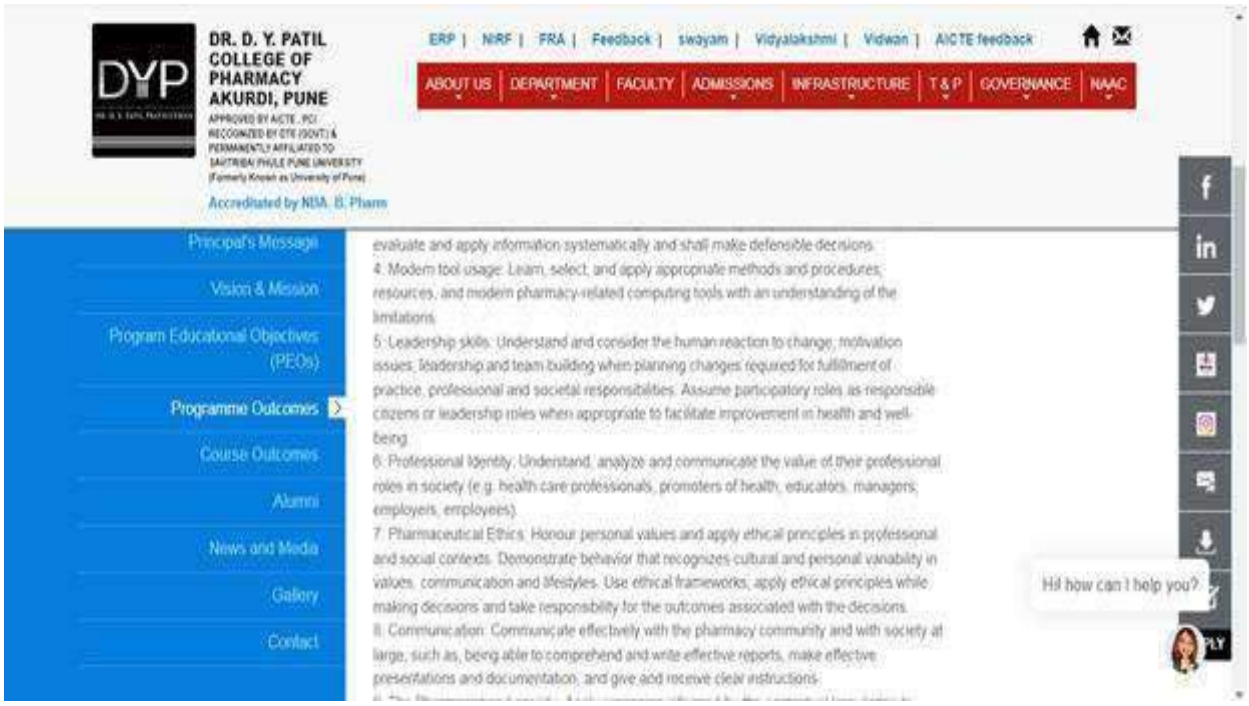
Ref. No. : DYPCOP/
Date :

Dissemination of Program Outcomes

Dissemination of Program Outcomes

1. College website:





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2. Journal:

Course outcomes of Pharmaceutical Analysis I

102.1 Elaborate scope, different techniques of Pharmaceutical analysis, different types of errors and limit tests.

102.2 Summarize concept of different types of volumetric titrations.

102.3 Explain principle, construction and applications of different types of electrochemical methods of analysis

102.4 Analyze inorganic compounds by volumetric titration methods and electro-analytical methods.

102.5 Summarize preparation and standardization of primary and secondary standards.

102.6 Develop analytical skills.

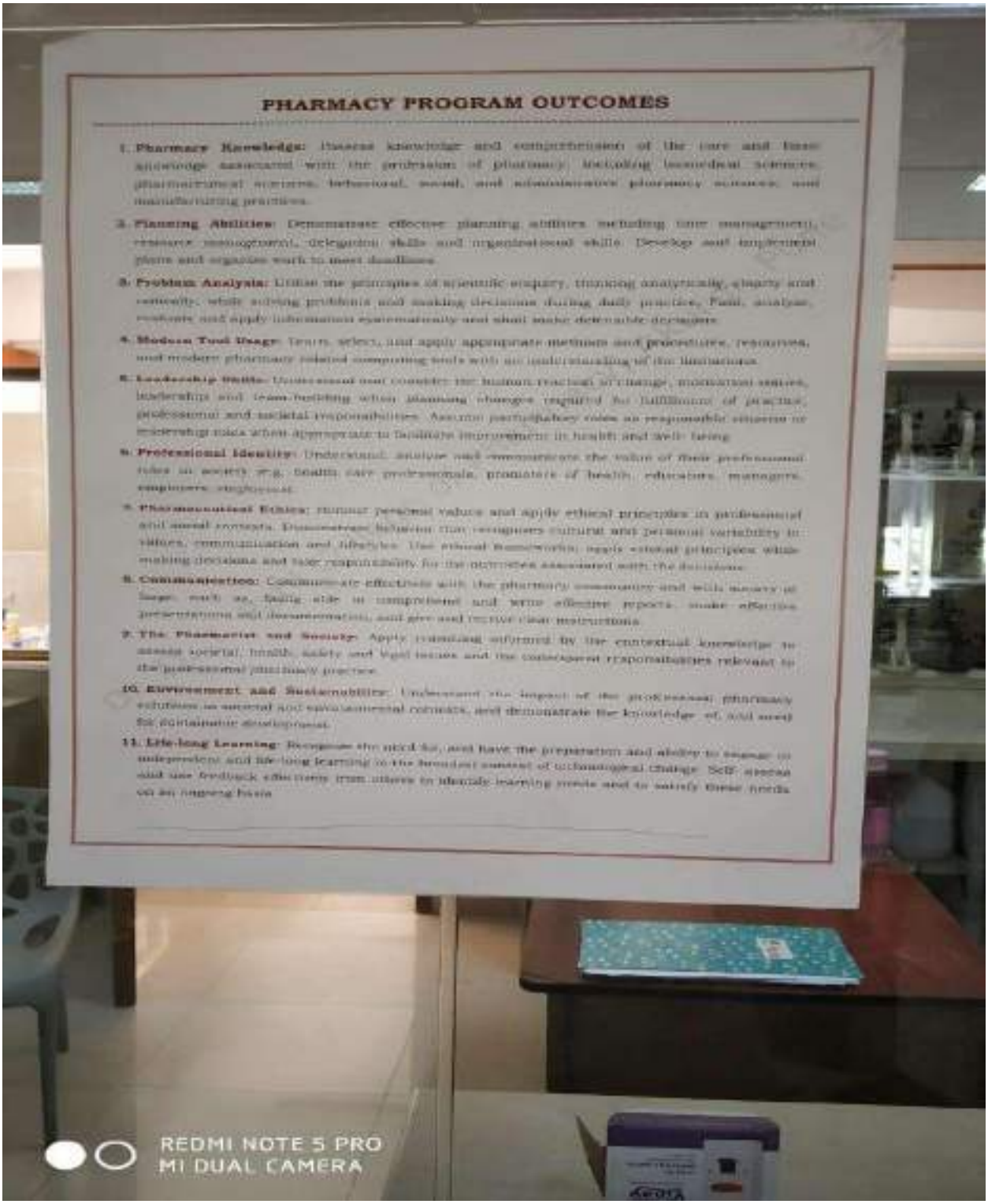
Program Outcomes:

1)Pharmacy knowledge, 2)Planning ability, 3) Problem analysis, 4) Modern tool usage, 5) Leadership skills, 6) Professional Identity, 7) Pharmaceutical Ethics, 8) Communication 9) The Pharmacist and Society, 10) Environment and sustainability, 11) Life-Long learning.

Quality of Experiments

Sr. No.	Experiment Name	Course outcomes mapped	Program outcomes mapped
1	To prepare and standardize 0.1 M Sodium Hydroxide	CO1,CO2, CO4, CO5, CO6	PO1,PO2,PO3, PO5, PO6, PO7, PO8, PO9,PO10, PO11
2	To prepare and standardize 1 M Sodium Hydroxide.	CO1,CO2, CO4, CO5, CO6	PO1,PO2,PO3, PO5, PO6, PO7, PO8, PO9,PO10, PO11
3	To prepare and standardize 0.1 M sodium Thiosulphate solution	CO1,CO2, CO4, CO5, CO6	PO1,PO2,PO3, PO5, PO6, PO7, PO8, PO9, PO11
4	To prepare and standardize 0.02 M of Potassium Permanganate	CO1,CO2, CO4, CO5, CO6	PO1,PO2,PO3, PO5, PO6, PO7, PO8, PO9, PO11
5	To prepare and standardize 0.1 M of Ceric ammonium sulphate	CO1,CO2, CO4, CO5, CO6	PO1,PO2,PO3, PO5, PO6, PO7, PO8, PO11

3. Laboratory:



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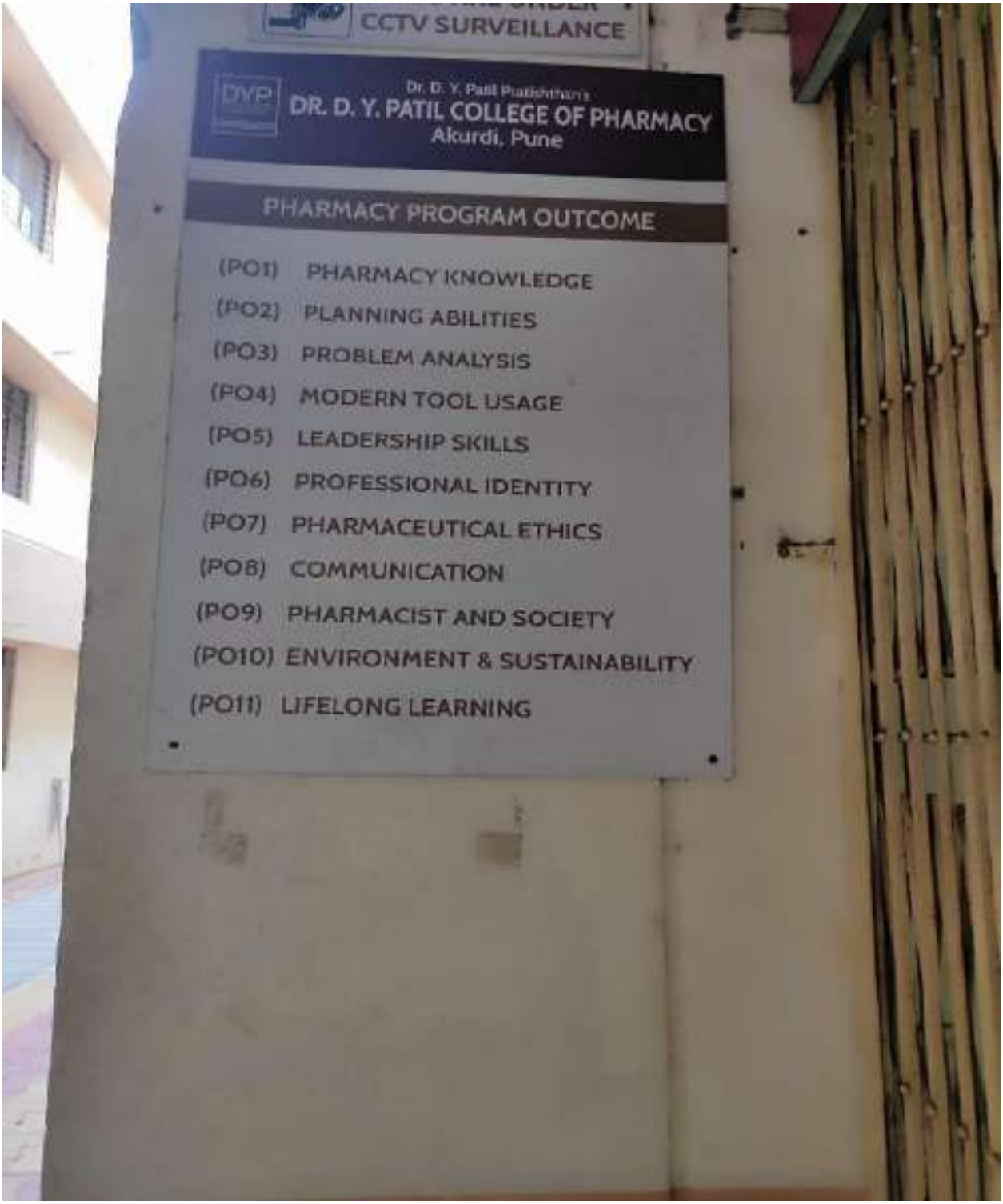
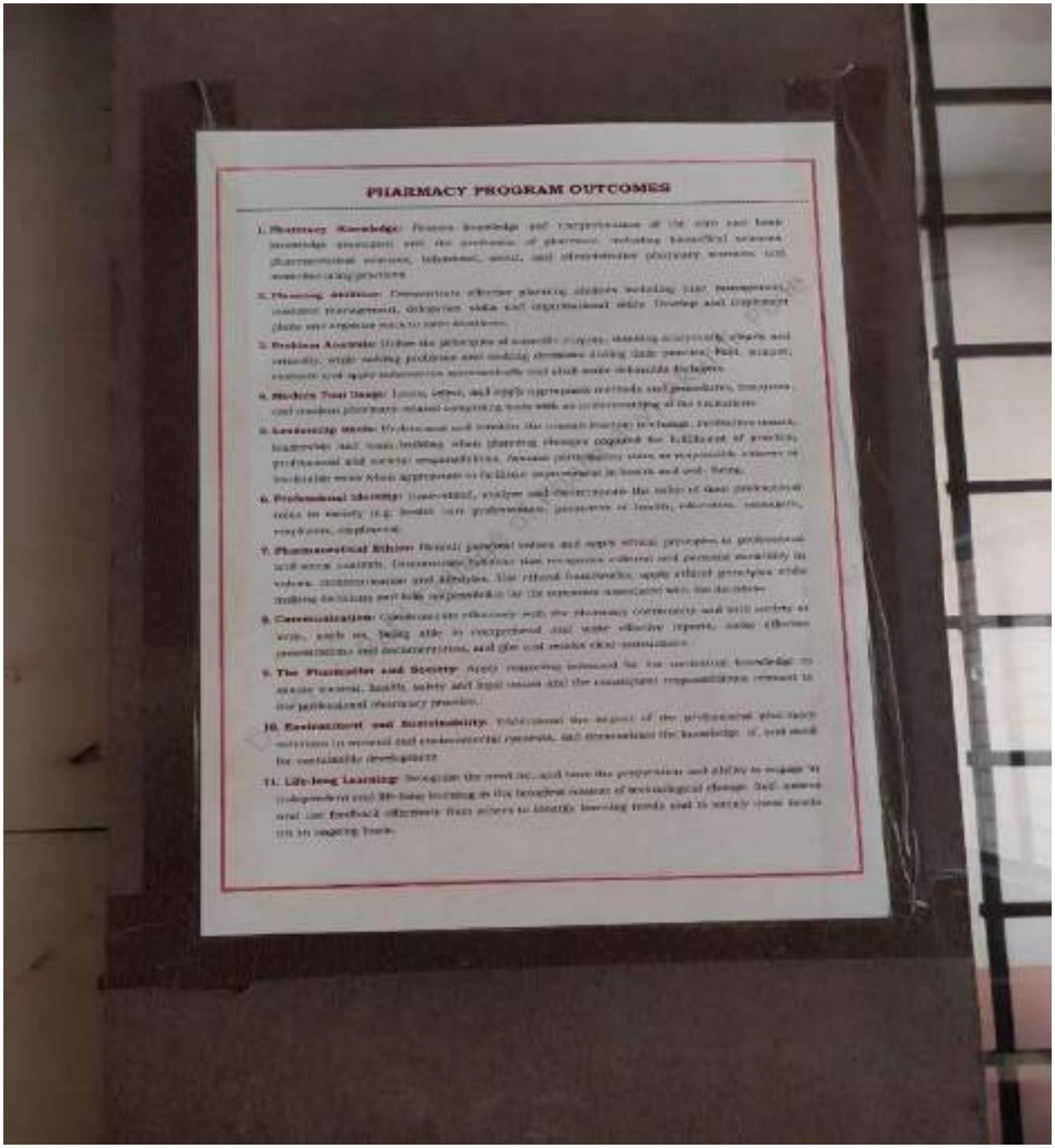
4. Corridor:



5. Class room



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Approved by : All India Council for Techinical Education, New Delhi
Pharmacy Council of India, New Delhi. Recognized by : Government of Maharashtra
Affiliated to Savitribai Phule Pune University, Pune

Dr. Sanjay D. Patil
President

Padmashree Dr. D. Y. Patil
Founder

Shri. Satej D. Patil
Vce-President & Chairman

Dr. N. S. Vyawahare
Principal

Sample copy of Question Paper Designed and mapped with Course outcomes and Programme outcomes

Dr. D. Y. Patil Pratishthan's
Dr. D. Y. Patil College of Pharmacy,
Akurdi, Pune-44

2021-22

Theory/Practical: Theory

Subject: Industrial Pharmacy-I

Semester: V

No of hours planned : 45

Subject code: BP 502 T

Class: Third year

No of Hrs. assigned: 3Hrs/week

Department: Pharmaceutics

Course Objectives:

Upon completion of the course the student shall be able to

1. Illustrate various pharmaceutical dosage forms and their manufacturing techniques.

2. Describe various factors to be considered in development of pharmaceutical dosage forms

3. Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality

Course Outcomes: (Theory)

BP502T (1) Discuss various concepts of preformulation.

BP502T (2) Elaborate formulation and evaluation of tablets, capsules and liquid orals using established procedures and technology with their defects and corrective approaches.

BP502T (3) Explain the concept, types, pharmacopoeial specifications, techniques and equipments used in tablet coating.

BP502T (4) Illustrate preformulation, formulation, and evaluation of parenteral and ophthalmic products.

BP502T (5) Estimate packaging materials for various pharmaceutical dosage forms.

BP502T (6) Discuss formulation of cosmetics such as lipsticks, shampoos, cold cream, vanishing cream, tooth pastes, hair dyes and sunscreens.

CO-PO Matrix:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	1	-	2	-	-	1	-	-	1	-	1
CO2	3	1	1	3	-	3	-	-	3	-	3
CO3	1	2	3	2	-	1	-	-	-	-	1
CO4	3	3	-	-	-	3	-	-	3	-	3
CO5	2	2	-	-	-	2	-	-	2	-	2
CO6	2	2	-	-	-	2	-	-	2	-	2
Avg	2	2	2	2.5	-	2	-	-	2.2	-	2

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Course Outcomes: (Practical)

BP506P (1) Design experiments showing influence of various additives on dosage form and stability studies.

BP506P (2) Formulate and evaluate tablets, capsules and liquid orals.

BP506P (3) Discuss pharmacopoeial specifications, techniques &equipments used in tablet coating.

BP506P (4) Evaluate formulated parenteral and ophthalmic products.

BP506P (5) Evaluate selected packaging materials for various pharmaceutical dosage forms.

BP506P (6) Formulate and evaluate various cosmetics products.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	1	1	-	-	1	1	-	1	1	-	1
CO2	3	3	-	-	3	3	-	3	3	-	3
CO3	1	1	-	-	1	1	-	1	1	-	1
CO4	3	3	-	-	3	3	-	3	3	-	3
CO5	1	1	-	-	1	1	-	1	1	-	1
CO6	1	1	-	-	1	1	-	1	1	-	1
Avg	1.67	1.67	-	-	1.67	1.67	-	1.67	1.67	-	1.667

SESSIONAL PAPER MAPPING

SESSIONAL 1

Q. NO.	Question	CO Mapped	BT level	PO Mapped
Q 1. SOLVE ANY 5 QUESTIONS				
1.	Justify the role of disintegrants in tablet and give two examples.	2	6	PO1, PO2, PO3, PO4, PO6, PO9, PO11
2.	Illustrate hydrates and solvates give examples?	1	4	PO1, PO3, PO6, PO9, PO11
3.	Justify the mechanism involved in Dry Granulation.	1	6	PO1, PO3, PO6, PO9, PO11
4.	Explain tablet troches and lozenges	2	6	PO1, PO2, PO3, PO4, PO6, PO9, PO11
5.	Explain the role of lubricants in tablets	2	6	PO1, PO2, PO3, PO4, PO6, PO9, PO11
6.	Justify chewable tablets	2	6	PO1, PO2, PO3, PO4, PO6, PO9, PO11
7.	Define granulation and their types.	2	1	PO1, PO2, PO3, PO4, PO6, PO9, PO11
Q 2. SOLVE ANY 2 QUESTIONS				
8.	Summarise the importance of partition co-efficient in the drug design with suitable examples.	1	6	PO1, PO3, PO6, PO9, PO11

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9.	Assess on dry granulation (roller compaction) technique and list out advantages and disadvantages	2	6	PO1, PO2, PO3, PO4, PO6, PO9, PO11
10.	Explain diluents and disintegrants used in tablet preparation	2	6	PO1, PO2, PO3, PO4, PO6, PO9, PO11
Q 2. SOLVE ANY 1 QUESTIONS				
11.	Explain different excipients and their functions used in the tablets	2	6	PO1, PO2, PO3, PO4, PO6, PO9, PO11
12.	Explain preformulation studies involved in development of tablet dosage forms	1	6	PO1, PO3, PO6, PO9, PO11

SESSIONAL II

Q. NO.	Question	CO Mapped	BT level	PO Mapped
Q 1. SOLVE ANY 5 QUESTIONS				
1.	Justify the role of additives in cosmetics	5	6	PO1, PO2, PO6, PO9, PO11
2.	Explain use of Parentrals	4	5	PO1, PO2, PO6, PO9, PO11
3.	Explain capsule	3	5	PO1, PO2, PO3, PO4, PO6, PO11
4.	Appraise the knowledge regarding hard gelatin capsule	3	6	PO1, PO2, PO3, PO4, PO6, PO11
5.	Justify the term bloom strength	3	6	PO1, PO2, PO3, PO4, PO6, PO11
6.	Summarise the soft gelatin capsule	3	6	PO1, PO2, PO3, PO4, PO6, PO11
7.	Predict the term packaging	6	6	PO1, PO2, PO6, PO9, PO11
Q 2. SOLVE ANY 2 QUESTIONS				
8.	Explain formulation of pallets	3	5	PO1, PO2, PO3, PO4, PO6, PO11
9.	Justify the packaging materials for pharmaceuticals	6	6	PO1, PO2, PO6, PO9, PO11
10.	Explain ophthalmic formulations	4	6	PO1, PO2, PO6, PO9, PO11
Q 2. SOLVE ANY 1 QUESTIONS				

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11.	Explain formulation and building blocks of aerosols	5	5	PO1, PO2, PO6, PO9, PO11
12.	Summarise the sterilization process	4	6	PO1, PO2, PO6, PO9, PO11

ASSIGNMENT MAPPING

TERM PAPER

Q. NO.	Question	CO Mapped	BT level	PO Mapped
1.	Explain film coating of tablets	2	6	PO1, PO2, PO3, PO4, PO6, PO9, PO11
2.	Classify capsule filling machines.	3	6	PO1, PO2, PO6, PO9, PO11
3.	Evaluate granules	2	6	PO1, PO2, PO3, PO4, PO6, PO9, PO11
4.	Appraise the knowledge regarding dry granulation	2	6	PO1, PO2, PO3, PO4, PO6, PO9, PO11
5.	Justify the term cosmetics	5	6	PO1, PO2, PO6, PO9, PO11

OPEN BOOK TEST

Q. NO.	Question	CO Mapped	BT level	PO Mapped
1.	Draw a table of marketed formulations of vials used in parenteral with its formulation.	4	6	PO1, PO2, PO6, PO9, PO11
2.	Draw a labeled diagram of tablet punching machine	1	6	PO1, PO3, PO6, PO9, PO11
3.	Classify packaging material for pharmaceuticals	6	6	PO1, PO2, PO6, PO9, PO11

Ms. N. Kaushal
Subject Teacher

Dr. S. P. Chaudhari
HOD

Dr. S. P. Chaudhari
IQAC Coordinator

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Dr. D. Y. Patil Pratishthan's
Dr. D. Y. Patil College of Pharmacy,
Akurdi, Pune-44
2020-21

Theory/Practical: Theory

Subject code: MPC203T

Subject: Computer aided drug design

Class: First year M. Pharm

Semester: II

No of Hrs. assigned: 4 Hrs/week

No of hours planned : 60

Department: Pharmaceutical Chemistry

Course Objectives:

At completion of this course it is expected that students will be able to understand

- Role of CADD in drug discovery
- Different CADD techniques and their applications
- Various strategies to design and develop new drug like molecules.
- Working with molecular modeling software's to design new drug molecules
- The in silico virtual screening protocols

Course Outcomes: (Theory)

MPC203T (1) Predict and analyzed molecular properties of new molecules and explain various drug design methods.

MPC203T (2) Elaborate the concept of pharmacophore mapping and Virtual Screening.

MPC203T (3) Discuss the Molecular Modeling and Docking technique.

MPC203T (4) Assess the role of computer aided drug design in drug discovery.

MPC203T (5) Discuss history and development of QSAR.

MPC203T (6) Apply statistically QSAR based applications.

CO-PO Matrix:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	3	-	3	-	3	-	-	3
CO2	3	3	3	3	-	3	-	3	-	-	3
CO3	3	3	3	3	-	3	-	3	-	-	3
CO4	1	1	1	1	-	1	-	1	-	-	1
CO5	1	1	1	1	-	1	-	1	-	-	1
CO6	2	2	2	2	-	2	3	2	-	-	2
Avg	2.17	2.17	2.17	2.17	-	2.17	3.00	2.17	-	-	2.17

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SESSIONAL PAPER MAPPING

SESSIONAL I

Q. NO.	Question	CO Mapped	BT level	PO Mapped
Q.1Answer the following (Any one) (10)				
a	Discuss various models used for predication of ADMET properties	1	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11
b	Summarize the Pharmacophore mapping process and its applications	2	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11
Q.2 Answer the followings (Any two) (10)				
a	Elaborate the concept of De novo drug design and it's application.	1	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11
b	Discuss methods used for conformational search used in Pharmacophore mapping	2	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11
c	Explain in detail Fragment based drug design	1	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11
Q.3 Write short note on (Any two) (10)				
a	Discuss importance of ADMET study in drug design.	1	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11
b	Differentiate between LUDI and SPROUT technique.	2	4	PO1, PO2, PO3, PO4, PO6, PO8,PO11
c	Elaborate on Homology modelling	1	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11

SESSIONAL II

Q. NO.	Question	CO Mapped	BT level	PO Mapped
Q.1Answer the following (Any one) (10)				
a	Elaborate on QSAR. Explain Hansch analysis and its applications in drug design.	6	6	PO1, PO2, PO3, PO4, PO6, PO7, PO8,PO11
b	Explain the methodology and applications of molecular docking in drug design.	3	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11
Q.2 Answer the followings (Any two) (10)				
a	Discuss various methods of energy minimization.	3	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11
b	Estimate the role of Quantum mechanics in drug design.	3	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11
c	Argue on steric features of the drug molecule are important in QSAR study.	5	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11
Q.3 Write short note on (Any two) (10)				

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a	Explain in detail about drugs acting on HMG CoA reductase with suitable example.	2	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11
b	Elaborate on Free Wilson Analysis	6	6	PO1, PO2, PO3, PO4, PO6, PO7, PO8,PO11
c	Discuss in detail about various parameters used in QSAR	5	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11

ASSIGNMENT MAPPING

PRESENTATION

Q. NO.	Question	CO Mapped	BT level	PO Mapped
1	Agents acting on enzymes such as DHFR	2	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11
2	Agents acting on enzymes such as HMG-CoA reductase	3	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11
3	Agents acting on enzymes such as HIV protease	2	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11
4	Agents acting on enzymes such as choline esterase (AchE)	2	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11
5	Agents acting on enzymes such as choline esterase (BchE)	2	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11

CASE STUDY

Q. NO.	Question	CO Mapped	BT level	PO Mapped
1	Assess the role of computer aided drug design in drug discovery	4	6	PO1, PO2, PO3, PO4, PO6, PO8,PO11

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