CAYM Education Trusts

Siddhant College of Pharmacy

A/P Sudumbare, Talegaon –Chakan Road, Tal:Maval, Dist: Pune -412109

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PROGRAMME AND COURSE OUTCOMES FOR ALL PROGRAMMES OFFERED BY THE INSTITUTION

CAYM Education Trusts
Siddhant College of Pharmacy
A/P Sudumbare, Talegaon – Chakan Road, Tal: Maval, Dist: Pune -412109

Academic Year 2021-22

Course Outcomes

M Pharm.: Pharmaceutical Quality Assurance

Sr. No.	Name of the Program	Name of the Course	Course Outcome
1	M Pharm	Modern Pharmaceutical Analytical Techniques	➢ Develops clear insight about theoretical and practical skills of the instruments used in pharmaceutical industry ➢ The students will understand principle and instrumentation
2		Quality Management System	➢ The student will understand the quality parameters and quality attribute in Pharmaceutical industry sectors ➢ By studying and practicing the guidelines iso, NABL and other regulatory agencies student will predicts the current need of changes. ➢ It provide the idea in the customers expectations in the quality pharmaceutical product. ➢ student will know the importance of the quality of medicines in the public. ➢ The subject will afford methodology in the regulatory body requirements for the import and export pharmaceutical products.
3		Quality control and Quality Assurance	➢ Student shall be able to understand the cGMP aspects in a pharmaceutical industry ➢ Student shall be able to understand the importance of documentation ➢ Student shall be able to understand the scope of quality certifications applicable to Pharmaceutical industries ➢ Student shall be able to understand the responsibilities of QA department ➢ Student shall be able to understand the

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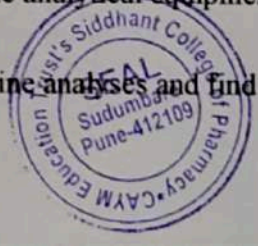
			responsibilities of QC department ➢ Student shall be able to understand GLP and regulatory Affairs
4		Product development and Technology Transfer	➢ To apply the knowledge to develop new procedures of their own design of Pilot layouts ➢ Student shall be able to understand the Quality by design practices of sterile and non sterile dosage forms ➢ Student shall be understand the Regulatory requirements in drug development stages ➢ Students shall understand the phase of technology transfer
5		Hazards and Safety Management	➢ To understand the energy resources in the to make eco-friendly industry environment ➢ The course knowledge useful to Find hazards in work atmosphere ➢ It creates the passage to understand, Determine and to take control measures to eliminate or minimize the level of the risks ➢ It support the student to recognize the control measures to eliminate or minimize the level of the risks ➢ It provides platform for formal process for hazard identification, risk assessment and control to effectively manage workplace and safety hazards ➢ It develop proper understanding in the stages of risk assesment
6		Pharmaceutical Validation	➢ The Students learn on the importance of validation. ➢ The student learns on the importance of patent and intellectual property rights. ➢ The students are trained on the qualification aspects of instruments. ➢ The importance of calibration to be performed for the instruments. ➢ The various validation aspects to be carried out in the industry. ➢ The students gain knowledge on how validation are carried for various components. Such as instrument validation, cleaning validation and

			process validation
7		Audit and Regulatory Compliance	➢ The student gain knowledge on the importance of auditing in pharmaceutical preparation. ➢ The various forms of auditing are and how an audit process happens are briefed to the students. ➢ Preparation of various audit checklist for the auditing. ➢ when and what are the areas the auditing to be carried is taught to the student. ➢ The Reporting form of the auditing process is taught to the student. ➢ The student practices the auditing process and reporting process
8		Pharmaceutical Manufacturing Technology	➢ Student shall be able to understand the common practice in the pharmaceutical industry developments ➢ Student shall be able to understand the practices of aseptic process technology ➢ Student shall be able to understand the practices of non-sterile manufacturing technology ➢ Student shall be able to understand the practices of packaging technology ➢ Student shall be able to understand understanding of principles and implementation of Quality by design (QbD)

Programme Outcomes:

1. Interpret the requirements for testing of raw materials, in-process samples, and finished product in accordance with pharmacopoeia standards.
2. Predict a variety of Quality Control activities including developing QC policies and Standard Operation Procedures, analyzing and archiving data, and interpreting results.
3. Evaluate the performance of a variety of laboratory equipment used in pharmaceutical industrial labs.
4. Assess instruments malfunction and troubleshoot the analytical equipment failure in compliance with regulatory requirements.
5. Identify and analyze unexpected results during routine analyses and find the solutions



based on scientific and regulatory considerations by implementing preventive action and corrective action programs.

6. Apply a working knowledge of GMP (Good Manufacturing Practice), GLP, ISO 9000 requirements to the manufacture of pharmaceuticals.
7. Understand the concept of quality systems and compliance in the regulated industry and the role of quality assurance.
8. Understand the use of controlled documentation.

Programme Specific outcomes (PSOs)

1. To Understand the applications of Quality assurance and Quality control throughout product life cycle.
2. To Analyze the Application Based Importance of Emerging Quality Building Concepts in Product Manufacturing.
3. To Perform Procedures like Method Validation, Process Validation, Equipment /Facilities/Utilities
4. Validation, Documents and Records Designing as per the Regulatory Standards Leading to compliance of cGMP.
5. To Understand the Regulatory requirements of Pharmaceuticals.

COURSE OUTCOME (CO)
M.PHARM(PHARMACEUTICS)

S.no	Name of the program	Name of the course	Course outcome
1	M.Pharm	**Modern Pharmaceutical Analytical Techniques**	Develops clear insight about theoretical and practical skills of the instruments used in pharmaceutical industry.
2		**Drug Delivery system**	Categorizes new drug delivery systems and formulations.
3		**Modern Pharmaceutics**	Establishes process of development of ethical and quality considerations of medical devices.
4		**Regulatory Affairs**	Develops Pharmacovigilence and process of monitoring in clinical trials
5		**Molecular Pharmaceutics (NanoTech and Targeted DDS)**	Establishes knowledge of Novel drug delivery systems.

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6		**Advanced Biopharmaceutics and pharmacokinetics**	Develops the student for designing and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.
7		**Computer Aided drug delivery System**	Develops Computer skills for Preclinical Development and Optimization Techniques in Pharmaceutical Formulation.
8		**Cosmetics and Cosmeceuticals**	Establishes skills of new combinations and formulations.

Program Specific Outcome (PSO)

M. Pharm(Pharmaceutics)

- Locates on patients and products, accordingly the curriculum has been framed. The theoretical concepts are specifically taught in theory and further the concepts are strengthened and measured during practical's.
- Develops knowledge regarding dosage forms, drug delivery systems, biopharmaceutics and pharmacokinetic study, computer aided drug development during the program and to understand dosage form design, optimization, *in-vitro* parameters and relevant techniques for drug development.
- Describes research methodology, key aspects in research and scientific writing to present the research work.
- Establishes knowledge regarding newer technology and skills in technology development and achieve maximum output.

Program Outcome (PO)

M. Pharm(Pharmaceutics)

PO1 Pharmaceutical Knowledge: Achieves a deep knowledge regarding therapeutic effect of the drug, its clinical use, development of new formulations, study of medical devices, guidelines of filing and approval processes, novel drug delivery systems, pharmacokinetic of the drugs, cosmetology and use of computers in pharmaceutical research.

PO2 Research Analysis: Establishes knowledge in research field to make new discoveries and dosage forms for better patient compliance.

PO3 Design & Development of dosage forms: Prepared to formulate new dosage forms in the pharmaceutical companies for the ease of patients.

PO4: Ethics: Develops ethical principles and commit to professional ethics and responsibilities and norms of the pharmacy practice.

PO5: Individual and team work: Constructs effectively as an individual, and as a member or leader in diverse teams acts as a multidisciplinary person in every context. Students will be able to demonstrate relevant and independent thinking and encourage participatory decision making in teams and as an individual in timebound manner.

PO6: Communication and global interaction: Develops communication effectively and specifically on pharmaceutical activities and dosage forms design, student would be able to interact with the community and global society for scientific interaction that would lead to development of better healthcare

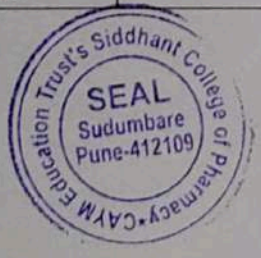
Course outcomes

B Pharmacy

Year	Subject	Outcome
I year	**BP101T. HUMAN ANATOMY AND PHYSIOLOGY-I** **CO1**	It establishes an insight related to human body and apply pharmaceutical science to it.
	BP102T. PHARMACEUTICAL ANALYSIS **CO2**	Students construct fundamentals of preparing different strength solutions and interpretations and may execute in its discipline.
	BP103T. PHARMACEUTICS-I CO3	Students establish techniques and ideas of new dosage forms and combination.
	BP104T. PHARMACEUTICAL INORGANIC CHEMISTRY **CO4**	It develops the monographs of inorganic drugs and pharmaceuticals.
	BP105T.COMMUNICATION SKILLS **CO5**	Constructs soft skills set to work cohesively with the team & develops leadership quality.
	BP 106RBT.REMEDIAL BIOLOGY **CO6**	Establishes knowledge of cell biology, classification system, theory of evolution, tissue system etc.
	BP 106RMT.REMEDIAL MATHEMATICS **CO7**	Constructs calculation techniques
	BP 201T. HUMAN ANATOMY AND PHYSIOLOGY-II **CO8**	It establishes an insight related to human body and apply pharmaceutical science to it.
	BP202T. PHARMACEUTICAL	Builds laboratory techniques

	ORGANIC CHEMISTRY –I **CO9**	
	BP203 T. BIOCHEMISTRY **CO10**	Constructs biochemical facts
	BP 204T.PATHOPHYSIOLOGY **CO11**	Builds a baseline knowledge required to practice medicine safely, confidently, rationally and effectively.
	BP205 T. COMPUTER APPLICATIONS IN PHARMACY **CO12**	Constructs use of IT tools in pharmaceuticalindustry.
	BP 206 T. ENVIRONMENTAL SCIENCES **CO13**	Demonstrates physical and biological characters of the environment along with socialand cultural.
	BP301T. PHARMACEUTICAL ORGANIC CHEMISTRY –II **CO14**	Develops basic knowledge about reactivity, method and mechanism of organic compound.
	BP302T. PHYSICAL PHARMACEUTICS-I **CO15**	Modifies in various areas of formulation research and development.
	BP 303 T. PHARMACEUTICAL MICROBIOLOGY **CO16**	Develops information of all categories of microorganisms.
	BP 304 T. PHARMACEUTICAL ENGINEERING	Develops pharmaceutical manufacturing skills.

II year	**CO17**	
	BP401T. PHARMACEUTICAL ORGANIC CHEMISTRY –III **CO18**	Develops knowledge on medicinal and other uses of organic compounds.
	BP402T. MEDICINAL CHEMISTRY – I **CO19**	Establishes the student in correlating between the pharmacology of a disease and its cure.
	BP 403 T. PHYSICAL PHARMACEUTICS-II **CO20**	Develops better insight into various areas of formulation research and development.
	BP 404 T. PHARMACOLOGY-I **CO21**	Establishes a correlation of pharmacology with other biomedical sciences.
	BP 405 T.PHARMACOGNOSYAND PHYTOCHEMISTRY I **CO22**	Categorizes herbal formulations
III year	**BP501T. MEDICINAL CHEMISTRY – II** **CO23**	Employ knowledge on structure activity relationships of drugs, importance of physicochemical properties and metabolism of drugs.
	BP 502 T. Industrial PharmacyI **CO24**	Builds student to understand and appreciate the influence of pharmaceutical additives and various pharmaceutical dosage forms on the performance of the drug product.
	BP503.T. PHARMACOLOGY-II **CO25**	Establishes knowledge of classification & mode of action of drugs.
	BP504 T. PHARMACOGNOSYAND PHYTOCHEMISTRY II	Establishes basic principles of traditional systemof medicine.



	CO26	
	BP 505 T. PHARMACEUTICAL JURISPRUDENCE **CO27**	Establishes knowledge about important legislations related to the profession of pharmacy in India.
	BP601T. MEDICINAL CHEMISTRY – III **CO28**	Develops fundamental knowledge on the structure, chemistry and therapeutic value of drugs.
	BP602 T. PHARMACOLOGY-III **CO29**	Establishes diagnostic and classification technique.
	BP 603 T. HERBAL DRUGTECHNOLOGY **CO30**	This subject gives the student the knowledge ofbasic understanding of herbal drug industry.
	BP 604 T. BIOPHARMACEUTICS AND PHARMACOKINETICS **CO31**	Employs techniques of dosage forms and regimen.
	BP 605 T. PHARMACEUTICAL BIOTECHNOLOGY **CO32**	This course would lead to new biological revolutions in diagnosis, prevention and cure of diseases.
	BP606TPHARMACEUTICAL QUALITY ASSURANCE **CO33**	Builds various aspects of quality control and quality assurance of pharmaceutical industries.
	BP701T. INSTRUMENTAL METHODS OF ANALYSIS **CO34**	Imparts fundamental knowledge on the principles and instrumentation of spectroscopic and chromatographic technique.

IV year		
	BP 702 T. INDUSTRIAL PHARMACYII **CO35**	Builds new ideas related to production of pharmaceutical products.
	BP 703T. PHARMACY PRACTICE **CO36**	Employs the student to provide minor ailments to the patients.
	BP 704T: NOVEL DRUG DELIVERY SYSTEMS **CO37**	Categorizes novel drug delivery system
	BP801T. BIOSTATISITCS AND RESEARCH METHODOLOGY **CO38**	Measures applications of Biostatics in Pharmacy.
	BP 802T SOCIAL AND PREVENTIVE PHARMACY **CO39**	Relates health issues and their challenges
	BP803ET. PHARMA MARKETING MANAGEMENT **CO40**	Develops the student for taking a challenging role in Sales and Product management.
	BP804 ET: PHARMACEUTICAL REGULATORY SCIENCE **CO41**	Establishes regulatory aspects and ethics.
	BP 805T: PHARMACOVIGILANCE	Develops skills of classifying drugs, diseases and adverse drug reactions.

	CO42	
	BP 806 ET. QUALITY CONTROL AND STANDARDIZATION OF HERBALS **CO43**	Develops standardization of herbal drugs
	BP 807 ET. COMPUTER AIDED DRUG DESIGN **CO44**	Develops rational drug design process.
	BP808ET: CELL AND MOLECULAR BIOLOGY (Elective subject) **CO45**	Theorize complete cell biology
	BP809ET. COSMETIC SCIENCE(Theory) **CO46**	Develops ideas of new formulations with different combinations.
	BP810 ET. PHARMACOLOGICAL SCREENINGMETHODS **CO47**	Creates hand in preclinical animal handling
	BP 811 ET. ADVANCED INSTRUMENTATION TECHNIQUES **CO48**	Develops knowledge about the principles and instrumentation of spectroscopic and chromatographic techniques.
	BP 812 ET. DIETARY SUPPLEMENTS AND NUTRACEUTICALS **CO49**	Constructs ideas regarding need and requirements of dietary supplements among different groups in the population.

Program Outcome

PO1: Pharmaceutical Knowledge:- Students achieve a deep knowledge regarding human body, its related diseases, analytical skills, drug molecules (Active Pharmaceutical Ingredients) along with excipients, natural drug resources, chemistry involved in API including synthesis of commonly used drugs, effect of drug on human body, toxicity and impurity profile, ADME studies of drugs (behavior of drug in human body), dosage form studies including novel approaches, designing and development of formulation stability studies, analysis etc

PO2: Research Analysis: Develops knowledge in research field to make new relevant discoveries and to identify new entities.

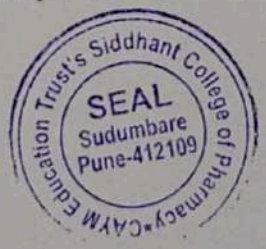
PO3: Design & Development of dosage forms: Describes preparation of various dosage forms that could be prepared by the pharmacy students in the pharmaceutical companies for the ease of patients and to optimize formulations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.

PO5: Modern methods usage: Create, select, and apply appropriate techniques, resources and modern methods with an understanding of the limitations and its usage. The student also learns to handle many instruments related to their studies which would help them work in a Pharmaceutical Industry, pharmacovigilance, regulatory requirements, legal processes etc.

PO6: Pharmacy and society: Pharmacist provide complete health care data and practices to the people of the society and guide them to be healthy. The student also learns drug distribution system, patient counseling, industrial laws etc. Students achieve expertise in storage and distribution of drugs with all precautions and in-depth knowledge of dose, adverse effect and other health related issues to deal with ambulatory and IPD patients in hospitals and also in public and achieve responsibility of computing profession and society.

PO7: Environment and sustainability: Locate the impact of the professional pharmacist in society and environment and make an impact of it on the people of the society.



PO8: Ethics: Justify & apply ethical principle and commit to professional ethics and responsibilities and norms of the pharmacy practice. Student is also trained in ethical behavior with physician, nurses and other paramedical staff for protecting patient's health.

PO9: Individual and team work: Function effectively as an individual and as a member or leader in diverse teams acts as a multidisciplinary person in every context. Students will be able to demonstrate rigorous and independent thinking and encourage participatory decision making in teams.

PO10: Communication: Develops Communication effectively on pharmaceutical activities with the community and with society.

PO11: Life-long learning: Recognize the need and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change and implement those technology by gaining experience.

PO12: Social Interaction: Being a public welfare job, a pharmacist would be able to interact with the people in a better way to cure them and make them feel healthy also investigate and evaluate the general state of public health conditions and concerns and develop and apply appropriate programs of action within program content area.

Program Specific Outcome

Some of the program specific outcomes are mentioned below:

PSO 1: Prepared to implement the knowledge gained during the course of the program from pharmacology, pharmaceutics, medicinal chemistry, pharmacognosy, APHE, communication skills, pharmaceutical analysis, biotechnology, biochemistry, cosmetology and environmental studies.

PSO 2: Develops knowledge of ethical and management principle required to work in a team as well as to lead a team.

PSO 3: Achieve multidisciplinary jobs in the pharmaceutical industries in various branches and would be able to write relevant and effective project reports in multidisciplinary environment in the context of changing technologies.

PSO4 Prepares to communicate easily and effectively. Would be able to perform multitasks in multifields including pharmaceuticals & cosmetic in timebound manner. Research area would be the key element.

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