

Subject Description Form

Subject Code	ABCT5114
Subject Title	Advanced Research in Drug Development
Credit Value	3
Level	5
Pre-requisite	ABCT5101, ABCT5012
Co-requisite	ABCT5109
Exclusion	Nil
Objectives	This course aims to provide students with state-of-the-art knowledge, techniques, and innovations in drug discovery and development. It focuses on interdisciplinary approaches integrating medicinal chemistry, biology, and pharmaceutical technology to address current and emerging challenges in the development of new therapeutics.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: 1. Explain key concepts in advanced drug discovery and development, from molecular design through clinical application. 2. Evaluate cutting-edge research techniques used in target identification, lead optimization, and medicinal chemistry. 3. Apply newly acquired theoretical concepts, tools, and technologies relevant to modern drug development through lectures and engaging in group discussions. 4. Critically assess emerging paradigms, including high-throughput screening, in silico modeling, and translational research approaches.
Subject Synopsis/ Indicative Syllabus	1. Recent Updates in Drug Discovery and Development • Advanced target identification and validation. • Novel strategies for lead generation (e.g., fragment-based drug design, AI-driven discovery). • Structure-based drug design and molecular modeling. • Cutting-edge screening approaches (high-throughput, virtual screening, etc.). 2. Contemporary Medicinal Chemistry Techniques • Emerging chemical modifications and bioconjugation strategies. • Concepts of pharmacophore modeling and QSAR (Quantitative Structure-Activity Relationship). • Optimization of ADME (Absorption, Distribution, Metabolism, and Excretion) properties. 3. Innovations in Formulation and Delivery • Advanced pharmaceutical formulations (e.g., nanotechnology, liposome-based delivery). • Targeted and controlled drug delivery systems. 4. Translational Research and Clinical Perspectives • Preclinical testing, IND (Investigational New Drug) submissions, and clinical trials phases.

	- Regulatory considerations and intellectual property in drug development. 5. Interdisciplinary Collaborations - Integration of biology, chemistry, data science, and engineering in modern drug research. - Case studies illustrating successful interdisciplinary projects and partnerships.					
Teaching/Learning Methodology	Lectures, group-project, presentations					
Assessment Methods in Alignment with Intended Learning Outcomes	Specific assessment methods/tasks	% (weighting)	Intended subject learning outcomes to be assessed (Please tick as appropriate)			
			a	b	c	d
	1. Attendance	10	√	√	√	√
	2. Presentation	45	√	√	√	
	3. Written Assignment	45	√		√	√
	Total	100 %				
	Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes: Attendance: Students’ attendance and engagement with lectures and group discussions are crucial to achieving the learning outcomes. Presentation: Students will present on a selected topic, showcasing their ability to analyze, synthesize, and clearly communicate advanced drug development concepts. Written Assignment: A comprehensive report or literature review where students critically assess current research, demonstrate theoretical understanding, and propose innovative ideas for drug development. Students are allowed to use GenAI tools to support their writing of and essays. If GenAI tools are used to support their essay writings, students must declare the use of such tools and how they have been used in the assessments. It should be noted that submitting a work generated by GenAI, in part or in whole, as your own (even in paraphrased form) constitutes an act of academic dishonesty; it is no different from asking another person to write your assignment or claiming others’ ideas as yours.					
Student Study Effort Expected	Class contact:					
	▪ Lecture			39 Hrs.		
	Other student study effort:					

	▪ Assignment	12 Hrs.
	▪ Self study	69 Hrs.
	Total student study effort	120 Hrs.
Reading List and References	Current trends in drug discovery, development and delivery (CTD4-2022) Murahari, Manikanta, editor. ; Nalluri, Buchi N., editor. ; Chakravarthi, G., editor. ; Conference on Current Trends in Drug Discovery and Delivery (2022 : India) London : Royal Society of Chemistry; 2023 SBN : 9781837671090 (PDF)	