

## Subject Description Form

<b>Subject Code</b>	ABCT5106
<b>Subject Title</b>	Technology Platforms in Drug Discovery
<b>Credit Value</b>	3
<b>Level</b>	5
<b>Pre-requisite</b>	N/A
<b>Co-requisite</b>	Nil
<b>Exclusion</b>	Nil
<b>Objectives</b>	<ol style="list-style-type: none"> <li>1) To learn the principles and mechanisms of different drug screening platforms.</li> <li>2) To explore drug screening techniques and experience state-of-the-art cell therapy facilities in PolyU.</li> <li>3) To gain hands-on experience using different technology platforms for drug discovery.</li> </ol>
<b>Intended Learning Outcomes</b>	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> <li>a) appreciate the critical importance of cutting-edge technology platforms in the drug discovery process.</li> <li>b) gain hands-on experience utilizing some of the most advanced drug discovery platforms.</li> <li>c) develop analytical skills, critical thinking and improve communication skills.</li> </ol>
<b>Subject Synopsis/ Indicative Syllabus</b>	<p>The working principles, utility, and operation of equipment and technology platforms will be taught. Students will learn to access the equipment concerned under the guidance from technicians. Students will also learn to analyze data generated by the equipment.</p> <p>Sample equipment to be discussed include</p> <ol style="list-style-type: none"> <li>1) Bacterial fermentation – principle, usage, and operation of fermenters.</li> <li>2) Eukaryotic cell suspension culture - principle, usage, and operation of bioreactors.</li> <li>3) Animal imaging– principle of different imaging methods ( CT, Ultrasound, NMR, and bioluminescence), and their usage</li> <li>4) Protein structure elucidation – principle and application of Cryo-EM and X-ray crystallography</li> </ol>

	<ul style="list-style-type: none"> <li>5) DNA sequence analysis – principle and applications of parallel sequencer</li> <li>6) Cell sorting – principle and application of flow cytometry</li> <li>7) High content imaging analysis – principle, operation and application of high content imaging in drug discovery</li> <li>8) Drug formulation – significance of drug formulation in drug development, operation of drug formulation device.</li> <li>9) Analysis of drug metabolites – principle and application of mass spectrometry.</li> <li>10) Virtual screening – principle of virtual screening, latest development in AI-assisted virtual screening, use of virtual screening software package.</li> <li>11) Advanced therapeutics facility.</li> </ul>					
<p><b>Teaching/Learning Methodology</b></p>	<p>Practical and lab report.</p> <ol style="list-style-type: none"> <li>1. Attendance – Students who attended less than 80% of all practical sessions will fail this component and the whole subject.</li> <li>2. Lab report – Students are required to submit an individual lab report summarizing their findings in the practical sessions</li> <li>3. Midterm and examination - Comprehensive exam including multiple-choice, short answer, and essay-type questions covering all topics, with an emphasis on risk management strategies, financial planning, and valuation methods. A more in-depth case study analysis focusing on principles and mechanisms of drug screening platforms.</li> </ol>					
<p><b>Assessment Methods in Alignment with Intended Learning Outcomes</b></p>	<p>Specific assessment methods/tasks</p>	<p>% (weighting)</p>	<p>Intended subject learning outcomes to be assessed (Please tick as appropriate)</p>			
			<p>a</p>	<p>b</p>	<p>c</p>	
<p>1. Attendance</p>		<p>10</p>		<p>√</p>	<p>√</p>	
<p>2. Lab report</p>		<p>30</p>	<p>√</p>	<p>√</p>	<p>√</p>	
<p>3. Mid-term</p>		<p>25</p>	<p>√</p>		<p>√</p>	
<p>4. Final Examination</p>		<p>35</p>	<p>√</p>		<p>√</p>	
<p>Total</p>		<p>100 %</p>				
<p>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</p>						

	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.	
<b>Student Study Effort Expected</b>	Class contact:	
	▪ Lecture + Laboratory	39 Hrs.
	Other student study effort:	
	▪ Lab report	20 Hrs.
	▪ Self-study	50 Hrs.
	Total student study effort	109 Hrs
<b>Reading List and References</b>	<ol style="list-style-type: none"> <li>1. Korfmacher, W. A. (Ed.). (2013). Mass spectrometry for drug discovery and drug development (Wiley Series on Mass Spectrometry). Wiley. ISBN : 1118516125</li> <li>2. Caldwell, G. W., &amp; Yan, Z. (Eds.). (2014). Optimization in drug discovery: In vitro methods (2nd ed., Methods in Pharmacology and Toxicology). Humana Press. ISBN : 9781627037426</li> </ol>	