<table>
<tr><td>Course Code</td><td colspan="3">PHYS8701 (RPG)</td></tr>
<tr><td>Title</td><td colspan="3">Physics experimental techniques</td></tr>
<tr><td>Offering Department</td><td colspan="3">Physics</td></tr>
<tr><td>Course Co-ordinator</td><td colspan="3">Prof M H Xie Physics</td></tr>
<tr><td>Course Co-ordinator Email</td><td colspan="3">mhxie@hku.hk</td></tr>
<tr><td rowspan="11">Teachers Involved</td><td>Name</td><td>Department</td><td>Percentage</td></tr>
<tr><td>Prof M H Xie</td><td>Physics</td><td>17.5</td></tr>
<tr><td>Prof X D Cui</td><td>Physics</td><td>15</td></tr>
<tr><td>Prof S Zhang</td><td>Physics</td><td>7.5</td></tr>
<tr><td>Dr F C C Ling</td><td>Physics</td><td>7.5</td></tr>
<tr><td>Dr D K Ki</td><td>Physics</td><td>7.5</td></tr>
<tr><td>Dr T T Luu</td><td>Physics</td><td>15</td></tr>
<tr><td>Dr J H C Lee</td><td>Physics</td><td>7.5</td></tr>
<tr><td>Dr Y J Tu</td><td>Physics</td><td>7.5</td></tr>
<tr><td>Dr Y F Chan</td><td>Electron Microscope Unit</td><td>7.5</td></tr>
<tr><td>Dr C Liu</td><td>Physics, SUSTech</td><td>7.5</td></tr>
<tr><td>Course Objectives</td><td colspan="3">This course provides a detailed account of some common experimental techniques in physics research. It introduces the basic working principles, the operational knowhow, and the strength and limitations of the techniques.</td></tr>
<tr><td>Course Contents & Topics</td><td colspan="3">This course will discuss and train students of the following techniques:
1. Noise and Data Analysis
2. Computer Grid
3. Raman spectroscopy and photoluminescence (PL)
4. Temporal characterization of ultrashort laser pulses
5. Chirped Pulse Amplification - Technique to amplify laser pulses
6. Cryogenics and low-noise electrical measurements
7. Nanofabrication techniques
8. Scanning Probe Microscopy (STM and AFM)
9. Electron and X-Ray Diffraction (LEED/RHEED/XRD)
10. Photoemission Spectroscopy (PES)
11. Transmission Electron Microscopy (TEM)
12. Radiation Detection and Measurements in Nuclear Physics</td></tr>
<tr><td>Course Learning Outcomes (CLO)</td><td colspan="3">On successful completion of this course, students should be able to:
CLO 1 describe and explain the working principles of the various techniques
CLO 2 identify the strength and limitation of each technique, therefore, choose the right technique for characterization of properties
CLO 3 know the operational details and interpret the data obtained by the techniques</td></tr>
<tr><td>Pre-requisites (and Co-requisites and Impermissible combinations)</td><td colspan="3">Nil</td></tr>
<tr><td>Offer in 2022 - 2023</td><td>Y 2nd sem</td><td>Examination</td><td>No Exam</td></tr>
<tr><td>Course Grade</td><td colspan="3">Pass or Fail</td></tr>
</table>

Grade Descriptors	Pass: Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. Fail: Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. Apply minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.		
Course Type	Lecture with laboratory component elective course		
Course Teaching & Learning Activities	Activities	Details	No. of Hours
	Lectures		32
	Demonstrations of some selective techniques		8
	Reading/Self study		80
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Attendance		20
	Presentation		40
	In class quizzes		40
Quota	9999 (9999 if no quota)		
Required/recommended reading and online materials	Nil		