Course Code	PHYS8701 (RPG)		
Title	Physics experimental techniques		
Offering Department	Physics		
Course Co-ordinator	Prof M H Xie Physics		
Course Co-ordinator Email	mhxie@hku.hk		
Teachers Involved	Name	Department	Percentage
	Prof M H Xie	Physics	10
	Prof X D Cui	Physics	7.5
	Prof S Zhang	Physics	7.5
	Prof A B Djurisic	Physics	7.5
	Dr F C C Ling	Physics	7.5
	Dr D K Ki	Physics	7.5
	Dr T T Luu	Physics	15
	Dr J H C Lee	Physics	7.5
	Dr Y J Tu	Physics	7.5
	Dr Y Yang	Physics	7.5
	Dr J Zhao	Appl. Phys., PolyU	7.5
	Dr C Liu	Physics, SUSTech	7.5
Course Objectives	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.		
Course Contents & Topics	This course will discuss and train students of the following techniques: 1. Noise and Data Analysis 2. Computer Grid 3. Raman spectroscopy and photoluminescence 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. Free-Electron Nanophotonics 9. Scanning Probe Microscopy 10. Electron and X-Ray Diffraction 11. Photoemission Spectroscopy 12. Transmission Electron Microscopy 13. Radiation Detection and Measurements in Nuclear Physics		
Course Learning Outcomes (CLO)	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		
Pre-requisites (and Co-requisites and Impermissible combinations)	Nil		

<table>
<tr><td>Offer in 2023 - 2024</td><td colspan="2">Y 2nd sem</td><td>Examination</td><td>No Exam</td></tr>
<tr><td>Course Grade</td><td colspan="4">Pass or Fail</td></tr>
<tr><td>Grade Descriptors</td><td colspan="4">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.</td></tr>
<tr><td>Course Type</td><td colspan="4">Lecture with laboratory component elective course</td></tr>
<tr><td rowspan="4">Course Teaching & Learning Activities</td><td>Activities</td><td colspan="2">Details</td><td>No. of Hours</td></tr>
<tr><td>Lectures</td><td colspan="2"></td><td>32</td></tr>
<tr><td>Demonstrations of some selective techniques</td><td colspan="2"></td><td>8</td></tr>
<tr><td>Reading/Self study</td><td colspan="2"></td><td>80</td></tr>
<tr><td rowspan="4">Assessment Methods and Weighting</td><td>Methods</td><td colspan="2">Details</td><td>Weighting in final course grade (%)</td></tr>
<tr><td>Attendance</td><td colspan="2"></td><td>20</td></tr>
<tr><td>Presentation</td><td colspan="2"></td><td>40</td></tr>
<tr><td>In class quizzes</td><td colspan="2"></td><td>40</td></tr>
<tr><td>Quota</td><td colspan="4">9999 (9999 if no quota)</td></tr>
<tr><td>Required/recommended reading and online materials</td><td colspan="4">Nil</td></tr>
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