Course Code	PHYS8701 (RPG)		
Title	Physics experimental techniques		
Offering Department	Physics		
Course Co-ordinator	Prof Y J Tu Physics		
Course Co-ordinator Email	yanjuntu@hku.hk		
Teachers Involved	Name	Department	Percentage
	Prof X D Cui	Physics	7.5
	Prof D K Ki	Physics	7.5
	Prof F C C Ling	Physics	7.5
	Prof T T Luu	Physics	15
	Prof Y J Tu	Physics	10
	Prof M H Xie	Physics	22.5
	Prof Z Wan	Physics	7.5
	Prof Y Yang	Physics	7.5
	Prof S Zhang	Physics	7.5
	Prof J Zhao	Appl. Phys., PolyU	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. Brief Review of the Use of LabView 2. Noise, Data Analysis, and Computer Grid 3. Photoluminescence & Raman Spectroscopy 4. Temporal Characterization of Laser Pulses 5. Chirped Pulse Amplification: Technique for Amplification of Laser Pulses 6. Electrical Characterizations 7. Cryogenics and Low-noise Electrical Measurements 8. Transmission Electron Microscopy 9. Electron and X-Ray Diffraction 10. Scanning Probe Microscopy/Spectroscopy 11. Photoemission Spectroscopy 12. Photonic Angle-resolved Techniques 13. Nanofabrication Techniques 14. Material Synthesis Techniques		
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		
Offer in 2026 - 2027	Y 2nd sem	Examination	No Exam

<table>
<tr><td>Course Grade</td><td colspan="3">A+ to F</td></tr>
<tr><td>Grade Descriptors</td><td colspan="3">A: 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.
B: Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.
C: Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.
D: Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate 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="3">Lecture with laboratory component elective course</td></tr>
<tr><td rowspan="4">Course Teaching & Learning Activities</td><td>Activities</td><td>Details</td><td>No. of Hours</td></tr>
<tr><td>Lectures</td><td></td><td>32</td></tr>
<tr><td>Demonstrations of some selective techniques</td><td></td><td>8</td></tr>
<tr><td>Reading/Self study</td><td></td><td>80</td></tr>
<tr><td rowspan="4">Assessment Methods and Weighting</td><td>Methods</td><td>Details</td><td>Weighting in final course grade (%)</td></tr>
<tr><td>Attendance</td><td></td><td>20</td></tr>
<tr><td>Presentation</td><td></td><td>40</td></tr>
<tr><td>In class quizzes</td><td></td><td>40</td></tr>
<tr><td>Quota</td><td colspan="3">9999 (9999 if no quota)</td></tr>
<tr><td>Required/recommended reading and online materials</td><td colspan="3">Nil</td></tr>
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