课程大纲
COURSE SYLLABUS

1.	**课程代码/名称** **Course Code/Title**	PHY5025/表面物理 Surface Physics
2.	**课程性质** **Compulsory/Elective**	专业选修课 Elective Course
3.	**课程学分/学时** **Course Credit/Hours**	4/64
4.	**授课语言** **Teaching Language**	中文 Chinese
5.	**授课教师** **Instructor(s)**	徐虎 Hu Xu
6.	**是否面向本科生开放** **Open to undergraduates or not**	是 YES
7.	**先修要求** **Pre-requisites**	（如面向本科生开放，请注明区分内容。 If the course is open to undergraduates, please indicate the difference.） 固体物理 PHY321-15 Introduction to Solid State Physics

8. **教学目标**
Course Objectives

（如面向本科生开放，请注明区分内容。 If the course is open to undergraduates, please indicate the difference.）

本课程内容涵盖表面结构、表面电子性质、表面振动、表面动力学过程等，这些内容有助于了解和掌握发生在表面上的现象，并且有利于对表面相关领域的深入研究。

This course covers the physics and theories related to surfaces, including surface structure, surface electronic properties, surface vibrations, surface dynamic processes, etc., which are of prime importance in understanding different surface phenomena and performing further surface related research works.

9. **教学方法**
Teaching Methods

（如面向本科生开放，请注明区分内容。 If the course is open to undergraduates, please indicate the difference.）

通过课程学习掌握表面原子结构，电子性质，表面吸附，表面动力学，表面扩散及生长等。这些内容可以用于理解和解决表面相关的问题。另外，通过学习掌握不同的表面分析技术。

After the course, the students are expected to be able to understand the basic knowledge on the surface atomic structures, electronic structures, surface adsorption, surface thermodynamics, surface diffusion and film growth progresses.
They can apply the concepts and methodologies (especially DFT) introduced in the course in understanding and solving realistic surface problems and cases.
They can develop and establish methodology and experimental techniques for analyses of different properties of surfaces.

10. **教学内容**
Course Contents
（如面向本科生开放，请注明区分内容。 If the course is open to undergraduates, please indicate the difference.）

	Section 1	关于表面结构，表面缺陷及表面动力学的基本概念，简要介绍密度泛函理论及其应用等 Basic concepts on surface structures, surface defects, surface thermodynamics, the brief introduction to density functional theory and its applications.
	Section 2	表面吸附和表面测量的基本理论背景，以及表面电子性质等 Basic theoretical background on surface adsorption and structure determination, and electron and ion core properties of surfaces
	Section 3	表面扩散、薄膜生长和表面催化的基本概念等 Basic concepts on surface diffusion and film growth processes and surface catalysis.

11. 课程考核
Course Assessment

（如面向本科生开放，请注明区分内容。 If the course is open to undergraduates, please indicate the difference.）

小测验（50%）+期末口头报告（50%）

Quiz（50%）+ Final presentation（50%）

12. 教材及其它参考资料
Textbook and Supplementary Readings

1. Physics of Surfaces and Interfaces, Harald Ibach, ISBN-13 978-3-540- 34709-5 Springer Berlin Heidelberg New York
2. Introduction to Surface and Thin Film Processes, JOHN A. VENABLES, Original ISBN 0 521 62460 6 hardback, Original ISBN 0 521 78500 6 paperback, Cambridge University Press
3. Solid Surfaces, Interfaces and Thin Films, Hans Lüth, ISBN 978-3-642-13591-0, Springer Heidelberg Dordrecht London New York