國立成功大學智慧半導體及永續製造學院
114-1 半導體製程學位學程博士學位候選人資格考核書單

Book List for Doctoral Qualifying Examination for 2025 Fall semester

of the Program on Semiconductor Process Technology

Under the NCKU Academy of Innovative Semiconductor and Sustainable Manufacturing

科目 **Subject Titles**	參考書籍 **Book List**
光電元件 Optoelectronic Devices	1. 參考書籍： • *A. Neamen,* Semiconductor *Physics & Devices, Basic Principles, 4/e,* 2. 考試方式：Close book.
半導體元件物理 Physics of Semiconductor Devices	1. 參考書籍： • A. Neamen, Semiconductor Physics & Devices, Basic Principles, 4/e, McGraw-Hill, 2012. Chap. 7-11 • 半導體元件物理/王水進著，滄海圖書，2024。 第 4-8 章 2. 考試方式：Close book.
半導體製程技術 Semiconductor Manufacturing Technology	1. 參考書籍 • Stephen A Campbell, Fabrication engineering at the micro and nanoscale, Oxford University Press Chapter 1 Intro Chapter 2 Semiconductor Substrate Chapter 3 Diffusion Chapter 4 Thermal Oxidation Chapter 5 Ion Implantation Chapter 7 Optical Lithography Chapter 8 Photoresists Chapter 11 Etching Chapter 12 Physical Deposition Chapter 13 Chemical Vapor Deposition Chapter 15 Device Isolation, Contacts, Metallization 2. 考試方式：Close book. 可使用沒有無線通訊功能之工程計算機，不得使用手機、平板、電腦等有無線通訊與文書儲存功能之設備。

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固態物理 Solid State Physics	1. 參考書籍： • "*Introduction to Solid State Physics*", 7th ed., by Charles Kittel, John Wiley and Sons, 1996. Chapters 1, 2, 4, 5, 6, 7, 8, 10, 11. • "*Optical Properties of Solids*", 2nd ed., by Mark Fox, Oxford, 2010. Chapters 2, 4, 7, 10. 2. 考試方式：Close book 3. Topics: Crystal Structure Wave Diffraction and the Reciprocal Lattice Phonons I. Crystal Vibrations Phonons II. Thermal Properties Free Electron Fermi Gas Energy Bands Semiconductor Crystals Plasmons, Polaritons, and Polarons Optical Processes and Excitons