

102(學)專業必修/必選修課程綱要表

課程名稱：(中文) 半導體奈米微影	開 課 學 程	半導體學院
	課程 代 碼	

授課教師：林本堅 教授

學分數	3	必/選修	製程部必修；其他部選修	開 課 年 級	碩士班、博士班、大四
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先修科目或先備能力：Undergraduate physics, chemistry, and math.

課程概述與目標： COURSE DESCRIPTION:

This course covers the key aspects of nanolithography in theory, practice, and innovations on diffraction-based imaging as well as materials, equipment, and processing in nanolithography. There is also coverage on well-proven as well as exploratory systems to expose students to many different situations, providing opportunities to train students in creativity, logical thinking, and problem solving, as well as equipping them for R&D and production engineering work in semiconductor companies.

這門課包含光波繞射、奈米微影材料、奈米微影機台、和奈米微影製程的理論、應用、和創新的基本觀念；也包括各種成熟和尚在開發中的奈米微影系統給學生們機會考量各種不同的情況，來促進他們創新、邏輯思考、和解決問題的能力，裝備學生們在半導體公司研發和生產的能力。

教科書 ¹	"Optical Lithography; Here is Why" Burn J. Lin, SPIE Press 2021
參考書目	"Principles of Optics" Born & Wolf, any edition "Introduction to Microlithography" L.F. Thompson, C.G. Willson, and M.J. Bowden, ACS Professional Reference Book, 1994 "Molecular theory of Lithography" Uzodinma Okoroanyanwu, SPIE Press 2015

課程綱要		對應之學生核心能力	核心能力達成指標	評量方式	評量時間點
單元主題	內容綱要				

This course is intended to equip students with theoretical and practical skills in nanolithography for doing research and for patterning nanometer semiconductors in massive and experimental quantities. A broader objective is to use high-resolution imaging as a vehicle to train students on innovative thinking and problem solving. 這門課教導理論和實用的奈米微影技術使學生們既能做奈米微影的研究，也能用奈米微影成像的技術幫助奈米微影級半導體的量產和試產。更廣的目的是藉奈米微影學的平台，訓練學生用創意思考並用創意解決問題。

Technology and systems	1. Exposure systems 2. Processing systems 3. Imaging and resolution enhancement 4. Alignment and overlay 5. Metrics and metrology 6. Masks 7. Immersion lithography 8. EUV lithography	微影領域之專業知識。 Professionalism in the nanolithography 創新、邏輯思考、和解決問題的能力。Ability to innovate & solve problems	Class presentations and discussions	Ex：口頭報告、筆試等 Class discussion, presentations, & homework	Ex：期中、期末等 期中考、期末考
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教學要點概述²：

- 教材編選：老師自著教科書，自編投影片
- 教學方法：教學、討論、作業、考試
- 評量方法：學生在課堂上解決問題，作業評分，考試評分

註：

- 教科書請註明書名、作者、出版社、出版年等資訊。
- 教學要點概述請填寫教材編選、教學方法、評量方法、教學資源、教學相關配合事項等。
- 研究所所有開設之課程皆須填寫此表格或提供原有格式之課程綱要表，並呈現於實地訪評現場。