

◆ NTHU Mango Summer Program- Semiconductor Sessions

Week	Date	Time	Course	Instructor	Location
1	July 6 (Mon)	PM 13:30-15:30	<p><u>Lecture</u></p> <p>1.1 Semiconductor Overview I : What is a Semiconductor? An introduction to the fundamental concepts of semiconductors, including materials, properties, and device physics.</p> <ul style="list-style-type: none"> • Fundamentals of Semiconductors Definition, energy band structure, and basic electrical behavior • Semiconductor Materials and Properties Carrier transport and doping mechanisms in different semiconductor materials • From Wafer to Device Overview of semiconductor fabrication from crystal growth to device formation • From Devices to Integrated Circuits (ICs) Basic concepts of how semiconductor devices are interconnected to form integrated circuits 	Prof. Yu-Lin Wang iNEMS, PME, NTHU	General Building IV TCFST Room 301 NTHU
	July 7 (Tue)	AM 9:30-11:30	<p><u>Lecture</u></p> <p>1.2 Semiconductor Overview II : The Unlimited World of Semiconductors. Exploring how semiconductor technologies enable modern electronic systems and drive emerging applications.</p> <ul style="list-style-type: none"> • Semiconductors in Computing and Artificial Intelligence Role in CPUs, GPUs, memory, and AI accelerators • Consumer Electronics and Communication Devices Applications in smartphones, wearable devices, and wireless communication technologies • Display and Optoelectronic Technologies Semiconductors in displays (e.g., LCD, OLED) and light-emitting/photonic devices 	Prof. Yu-Lin Wang iNEMS, PME, NTHU	General Building IV TCFST Room 301 NTHU
	July 8 (Wen)	PM 13:30-16:30	<p><u>Practical Course 2.1</u></p> <ul style="list-style-type: none"> • Introduction to Semiconductor Fundamentals • Basic Fabrication Process – Video Demonstration and Explanation 	CNMM Staff	CNMM NTHU

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	July 9 (Thu)	PM 13:30-16:30	<u>Practical Course 2.2</u> <ul style="list-style-type: none"> Safety Instructions before entering clean room EVG610 Lithography Hands-on Practice E-gun III Operation Wafer Cleaning Practice in Yellow Room Wafer Introduction and Close-up Hands-on Experience 	CNMM Staff	CNMM NTHU
2	July 13 (Mon)	PM 13:30-16:30	<u>Lecture</u> 1.3 Semiconductor Overview III : The Semiconductor Manufacturing Process A comprehensive overview of integrated circuit (IC) manufacturing processes from design to finished chip. <ul style="list-style-type: none"> IC Process Flow Design, fabrication, packaging, and testing of integrated circuits Foundry and Manufacturing Model Overview of the fabless–foundry ecosystem and industry structure Wafer Processing Steps Key fabrication processes including lithography, deposition, and etching 	Prof. Sheng-Shian Li iNEMS, PME, NTHU	General Building IV TCFST Room 301 NTHU
	July 14 (Tue)	AM 9:30-11:30	<u>Lecture</u> 1.4 Semiconductor Overview IV : Why Semiconductor industry is crucial? Understanding the global semiconductor industry ecosystem and Taiwan’s strategic role. <ul style="list-style-type: none"> The semiconductor industry value chain Overview of key stages from design, fabrication, packaging, to end applications Taiwan as a global semiconductor hub Its role as the “Silicon Valley of Asia” in the global supply chain Why Taiwan (and TSMC) leads advanced semiconductor fabrication Technological leadership in cutting-edge process nodes and manufacturing capability Global importance of Taiwan’s semiconductor industry Its critical role in supporting worldwide technology development and supply stability 	Prof. Sheng-Shian Li iNEMS, PME, NTHU	General Building IV TCFST Room 301 NTHU
	July 15 (Wen)	AM 9:30-11:30	<u>Practical Course 2.3</u> <ul style="list-style-type: none"> EVG610 Lithography Hands-on Practice 	CNMM Staff	CNMM NTHU

Week	Date	Time	Course	Instructor	Location
	July 15 (Wen)	PM 13:30-16:30	<u>Practical Course 2.4</u> <ul style="list-style-type: none"> SEM Theory and Observation RIE Hands-on Practice and Demonstration Wafer Introduction and Close-up Hands-on Experience Wafer Cleaving into Four Pieces 	CNMM Staff	CNMM NTHU
3	July 20 (Mon)	PM 13:30-16:30	<u>Lecture</u> 1.5 Semiconductor Overview V : Inside the Semiconductor World – Engineer Insights A panel discussion with semiconductor engineers and professors, sharing real-world experiences. <ul style="list-style-type: none"> What does a semiconductor engineer do? How to become a chip engineer? Career paths in the semiconductor industry The semiconductor world needs more than engineers students from STEM and humanities backgrounds can also find meaningful and rewarding career opportunities	Prof. Sheng-Shian Li iNEMS, PME, NTHU	General Building IV TCFST Room 301 NTHU
	July 23 (Thu)	AM & PM	<u>Visiting</u> Materials Analysis Technology Inc. (MA-tek) https://www.matek.com/	-	MA-tek
4	July 27 (Mon)	PM 14:00-16:00	<u>Visiting</u> TSMC Museum of Innovation https://www.tsmcmoi.com/en/	-	TSMC Museum of Innovation
	July 30 (Thu)	AM or PM	<u>Visiting</u> Students Clubs of NTHU Power Mechanical Engineering Department (PME) <ul style="list-style-type: none"> DIT Robotics https://goo.gl/6zX18S NTHU Racing Team https://www.nthuracing.com/en 	-	Engineering Building I NTHU