

MENA 5010/9010 Lectures Place: Grupperom FV 414, main book *Thomas Heinzl, Mesoscopic Electronics in Solid State Nanostructures*, Second Edition, 2007 (TH)

Date	Time	Activity	Content/Source
Mon. 15. Jan.	9:15-12:00	Lecture	<u>Introduction to nanophysics</u> : review of main areas of nanophysics, characteristic length scales, details of the course content
			Lecture notes, TH, Ch 1 (pp 20-33) and Ch 5 (pp 158-165) – pages in pdf
Fri. 19. Jan.	10:15-13:00	Lecture	<u>Update of solid state physics</u> Video
			TH, Ch 2 (pp 34-74)
Mon. 22. Jan.	9:15-12:00	Lecture	<u>Update of solid state physics</u> Video
			TH, Ch 2 (pp 34-74)
Fri. 26. Jan.	10:15-13:00	Lecture	<u>Surfaces, interfaces, and layered devices</u> Video
			Ch 3 (pp 76-114)
Mon. 29. Feb.	9:15-12:00	Lecture	<u>Experimental techniques: sample preparation, elements of cryogenics</u>
			TH Ch 4 (pp 116-156)
Fri. 2. Feb.	10:15-13:00	Lecture	<u>Magneto-transport properties of quantum films: Landau quantisation, quantum Hall effect, Shubnikov-de Haas oscillations</u> Video
			TH Ch 6 (pp 166-195)
Mon. 5. Feb.	9:15-12:00	Lecture	<u>Graphene: most two-dimensional system imaginable</u> Video
			Lecture notes
Fri. 9. Feb.	10:15-13:00	Lecture	<u>Quantum Wires and Quantum Point Contacts</u> Video
			TH Ch 7 (pp 196-241)
Mon. 12. Feb.	9:15-12:00	Lecture	<u>Electron Phase Coherence</u> Video
			TH Ch 8 (pp 242-265)
Fri. 16. Feb.	10:15-12:00	Lecture	<u>Single Electron Tunnelling</u> Video
			TH Ch 9 (pp 266-291)
Mon. 19. Feb.	9:15-12:00	Lecture	<u>Quantum Dots</u> Video

			TH Ch 10 (pp 291-326)
Fri. 23. Feb.	10:15-13:00	Lecture	<u>Nanomechanics</u> <u>Video</u>
			Lecture notes
Mon. 26. Mar.	9:15-12:00	Lecture	<u>Nanophotonics</u> <u>Video</u>
			Lecture notes
Fri. 1. Mar.	10:15-13:00	Lecture	<u>Mesosopic superlattices</u> <u>Video</u>
			TH Ch 11 (pp 328-340)
Mon. 4. Mar.	9:15-12:00	Lecture	<u>Spintronics</u> <u>Video</u>
			TH Ch 12 (pp 342-360)
Fri. 8. Mar.	10:15-13:00		<u>Superconductivity</u> <u>Video</u>
			Lecture notes
Mon. 11. Mar.	9:15-12:00		<u>Nanoscale Superconductivity</u> <u>Video</u>
			Lecture notes
Fri. 15. Mar.	10:15-13:00		Students presentations
Mon. 18. Mar.	9:15-12:00		Students presentations
Fri. 22. Mar.	10:15-13:00		Students presentations