

## Reading List – MSc Nanoelectronics

(E = Essential, R = Recommended)

### **MODULE 1: FUNDAMENTALS OF SEMICONDUCTOR PHYSICS**

#### **Crystalline Structures and Inorganic Semiconductors**

1. N.W. Ashcroft and N. D. Mermin, "Solid State Physics", (E)
2. Charles Kittel, "Introduction to Solid State Physics", (R)
3. J. Singh, "Physics of Semiconductors and their heterostructures", McGraw Hill 1993 (E)
4. J. Singh, "Semiconductor optoelectronics, physics and technology", McGraw Hill 1995 (R)
5. R. M. Martin, "Electronic Structure", (R)

#### **Disordered Systems and Organic Semiconductors**

6. B. G. Yacobi, "Semiconductor Materials – an introduction to basic principles", Kluwer Academic Publishers, New York, 2003 (E)
7. R. W. Kelsall, I. W. Hamley, M. Goeghan, "*Nanoscale science and technology*", John Wiley & Sons Ltd. 2005, (R)

#### **Semiconductor Device Physics**

8. Ms Tigai, "Introduction to Semiconductor Materials and devices", John Wiley and Sons 1991 (R)
9. S. M. Sze, "Physics of semiconductor devices", John Wiley and Sons 1981 (E)
10. K. K. Ng, "Complete guide to semiconductor devices", McGraw-Hill 1995 (R)

### **MODULE 2: ELECTRONIC MATERIALS AND NANO-CHARACTERISATION**

#### **Materials synthesis and Assessments (All R)**

1. Chang, C.Y. and Kai, F., "GaAs High Speed Devices", Wiley-Interscience, 1994.
2. Williams, R., "Modern GaAs Processing Methods", Artech House. 1990.
3. Sze, S. M., "High Speed Semiconductor Devices", Wiley- Interscience, 1990.
4. Herman, M.A. and Sitter, H., "Molecular Beam Epitaxy", Springer-Verlag, 1996
5. Holloway, P.H. and McGuire, G.E. (Editors), "Handbook of Compound Semiconductors – Growth, Processing, Characterization and Devices", William Andrew Publishing/Noyes, 1995.

### **MODULE 3: INTRODUCTION TO PROCESS TECHNOLOGIES**

#### **Semiconductor Process Technology I – Inorganic Semiconductors**

1. G. S. May, S. M. Sze, "Fundamentals of semiconductor fabrication", Wiley, 2004. (E)
2. G.E. McGuire (Editor), "Semiconductor Materials and Process Technology Handbook", William Andrew Publishing/Noyes, 1988. (R)

3. P.H. Holloway, G.E. McGuire (Editors), "Handbook of Compound Semiconductors – Growth, Processing, Characterization and Devices", William Andrew Publishing/Noyes, 1995. (R)

### **Semiconductor Process Technology II – Organic semiconductors**

4. H. Klauk, "Organic electronics – Materials, manufacturing and applications", Wiley, 2006 (E)
5. J. Locklin, Z. Bao, "Organic field-effect transistors", CRC Press, Taylor & Francis Group 2007 (R)

## **MODULE 4: PHYSICS OF PHOTONIC DEVICES**

### **Interaction of light with matter (All R)**

1. Quantum Dot Heterostructures by Dieter Bimberg, Marius Grundmann, Nikolai N. Ledentsov

### **Emitters and Detectors (All R)**

2. Fundamentals of Photonics (Wiley Series in Pure & Applied Optics) by Bahaa E. A. Saleh, Malvin Carl Teich
3. Optical Electronics in Modern Communications (Oxford Series in Electrical & Computer Engineering) by Amnon Yariv
4. Distributed Feedback Semiconductor Lasers (IET Circuits, Devices and Systems), by J.E. Carroll, J.E.A. Whiteaway and R.G.S. Plumb
5. Optoelectronics: an introduction by John Wilson and John Hawkes
6. Quantum Dot Heterostructures by Dieter Bimberg, Marius Grundmann, Nikolai N. Ledentsov

## **MODULE 5: NANOELECTRONIC DEVICES**

### **Nanoelectronic Structures and Novel Devices (All R)**

1. "The physics of low-dimensional semiconductors: an introduction", John H. Davies, Cambridge University Press, 1998.
2. "Electronic transport in mesoscopic systems", S. Datta, Cambridge University Press, 1995.
3. "Introduction to Nanoelectronics", V. V. Mitin, Cambridge University Press, 2008

### **Nanoscale CMOS and Emerging Architectures (All R)**

- 4 "Nano-CMOS Circuit and Physical Design" Ban Wong, Anurag Mittal, Yu Cao, Greg W. Starr, Wiley, 2004

## **MODULE 6: TERAHERTZ TECHNOLOGIES**

### **Terahertz Electronic Devices and Circuits (All E)**

1. Chang, C.Y. and Kai, F., "GaAs High Speed Devices", Wiley-Interscience, 1994.
2. Williams, R., "Modern GaAs Processing Methods", Artech House. 1990.

3. Sze, S. M., "High Speed Semiconductor Devices", Wiley- Interscience, 1990.

**Terahertz Photonic Devices and Systems (All E)**

4. Terahertz Frequency Detection and Identification of Materials and Objects (NATO Science for Peace and Security Series B: Physics and Biophysics), Edited by R.E. Miles, X.-C. Zhang, H. Eisele and A. Krotkus
5. Terahertz Spectroscopy (Optical Science and Engineering Series): Principles and Applications (Optical Science and Engineering) Edited by Susan L. Dexheimer
6. Terahertz Optoelectronics (Topics in Applied Physics), Edited by Kiyomi Sakai