

**NANYANG TECHNOLOGICAL UNIVERSITY
SCHOOL OF MATERIALS SCIENCE AND ENGINEERING**

**RECOMMENDED TEXTBOOKS AND REFERENCES
MSE FIRST YEAR
ACADEMIC YEAR 2016-2017**

MS1013 MATERIALS CHEMISTRY I

Textbook

Chang, Raymond, Chemistry, 11th Edition, McGraw-Hill, 2012 (Call no: QD31.2.C456 2013)

MS1015 MATERIALS SCIENCE

Textbook

Callister, William D., Materials science and engineering : an introduction, 9th Edition, Wiley, 2014 (Call no: TA403.C162 2014)

Reference

Shackelford, James F., Introduction to Materials Science for Engineers, 8th Edition, Pearson Education, 2015(Call no: TA403.S524 2015)

MS1016 THERMODYNAMICS OF MATERIALS

Textbook

Ragone, David V., Thermodynamics of Materials, Wiley, 1995.
(Call no: TA418.52.R144 V1, A418.52.R144V2)

Reference

Gaskell, David R., Introduction to the Thermodynamics of Materials, 5th Edition, Taylor & Francis, 2008 (TN673.G248 2008)

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**RECOMMENDED TEXTBOOKS AND REFERENCES
MSE SECOND YEAR
ACADEMIC YEAR 2016-2017**

MS2012 INTRODUCTION TO MANUFACTURING PROCESSES

Textbook

Serope Kalpakjian, Steven Schmid, Manufacturing Engineering and Technology, 7th Edition, Pearson/Prentice Hall, 2014 (Call no: TS176.K14 2014)

Mikell P. Groover, Fundamentals of Modern Manufacturing: Materials, Processes and Systems, 5th SI Edition, John Wiley & Sons, Inc, 2013 (TS183.G876 2013)

MS2013 POLYMERS AND COMPOSITES

Textbook/Reference

R.J. Young and P.A. Lovell, Introduction to Polymers, 3rd Edition, Chapman & Hall, 2011.
(Call no: QD381.Y75 2011)

Brazel, Christopher S., Stephen L. Rosen, Fundamental Principles of Polymeric Materials, 3rd Edition, Wiley, 2012. (TA455.P58R813 2012, E-book)

D Hull, Introduction to Composite Materials, 2nd Edition, Cambridge Press, 1996.
(TA418.9.C6H913 1996, E-book)

MS2014 MATERIALS STRUCTURE AND DEFECTS

Reference

Samuel M. Allen, Edwin L. Thomas, The Structure of Materials, John Wiley, 1999.
(Call no: TA403.A429)

Anthony Kelly, Kevin M. Knowles, Crystallography and Crystal Defects, 2nd Edition, John Wiley, 2012. (QD931.K29 2012)

Special topics:

Christopher Hammond, Introduction to Crystallography, Revised Edition, Oxford University Press, 1992 (QD905.2.H225 1992)

Derek Hull, D. J. Bacon, Introduction to Dislocations, 5th Edition, Pergamon Press, 2011
(QD921.H913 2011, E-book)

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MS2015

MECHANICAL BEHAVIOUR OF MATERIALS

Textbook

Dowling, Norman E., *Mechanical Behavior of Materials : Engineering Methods for Deformation, Fracture, and Fatigue*, 4th Edition, Pearson, 2013.(Call no: TA404.8.D747 2013)

Hosford, William F., *Mechanical Behavior of Materials*, 2nd Edition, Cambridge University Press, 2010 (TA405.H825 2010, E-book)

Hibbeler, R. C., *Statics and Mechanics of Materials*, 4th edition, Pearson Prentice Hall, 2014 (TA405.H624S 2014, E-book)

MS2016

PHASE TRANSFORMATION AND KINETICS

Textbook

Porter, David A., *Phase Transformations in Metals and Alloys*, 3rd Edition, CRC Press, 2009. (Call no: TN690.P844 2009, E-book)

Çengel, Yunus A., *Heat and Mass Transfer: Fundamentals and Applications*, 4th Edition in SI units, McGraw Hill Higher Education, 2010/2011 (TJ260.C395 2010, TJ260.C395 2011)

Reference

Kurz, W., *Fundamentals of Solidification*, 4th rev. Edition, Trans Tech Publications, 1998 (QC303.K96 1998)

Çengel, Yunus A., *Thermodynamics : An Engineering Approach*, 8th Edition, McGraw-Hill, 2015 (TJ265.C395 2015)

Janna, William S., *Engineering Heat Transfer*, 3rd Edition, CRC Press, 2009 (TJ260.J34 2009)

Shavit, Arthur, *Thermodynamics : From Concepts to Applications*, 2nd Edition, CRC Press, 2009 (QC311.S533)

Kaufman, Myron, *Principles of Thermodynamics*, Marcel Dekker, 2002 (QD504.K21, E-book)

Ragone, David V., *Thermodynamics of Materials*, Wiley, 1995 (TA418.52.R144 V1, TA418.52.R144 V2)

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SCHOOL OF MATERIALS SCIENCE AND ENGINEERING**

MS2018 ELECTRONICS AND MAGNETIC PROPERTIES OF MATERIALS

Textbook

S.O. Kasap, *Principles of Electronic Materials and Devices*, 3rd Edition, McGraw-Hill, 2006.
(Call no: TK453.K19 2006)

Reference

Neil W. Ashcroft, N. David Mermin, *Solid State Physics*, Thomson Brooks/Cole, 1976
(QC176.A823)

Donald A. Neamen, *Semiconductor Physics and Devices: Basic Principles*, 4th Edition, McGraw Hill, 2012 (QC611.N348 2012)

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SCHOOL OF MATERIALS SCIENCE AND ENGINEERING**

**RECOMMENDED TEXTBOOKS AND REFERENCES
MSE THIRD YEAR
ACADEMIC YEAR 2016-2017**

MS3011 METALLIC AND CERAMIC MATERIALS

Textbook/Reference

W.D. Callister, Materials Science and Engineering: An introduction, Wiley, 2014
(Call no: TA403.C162 2014)

D.Henkel, A.Pense, Structure and Properties of Engineering Materials, 5th Edition, McGraw Hill, 2001 (TA403.H513)

R.E. Smallman, R. Bishop, Physical Metallurgy and Advanced Materials, 7th Edition, Butterworth-Heinemann, 2007 (TN690.S635 2007, E-Book)

M.Barsoum, Fundamentals of Ceramics, IOP publishing Ltd, 2003
(TP807.B282 2003, E-Book)

MS3012 MICRO/NANOELECTRONIC MATERIALS PROCESSING

Textbook

J.D. Plummer, M.D. Deal, P.B. Griffin, Silicon VLSI Technology: Fundamentals, Practice and Modeling, Prentice Hall, 2000. (Call no: TK7874.75.P735)

S.M. Sze, Semiconductor Devices: Physics and Technology, 3rd Edition, John Wiley & Sons, 2012/2013 (TK7871.85.S997 2012, TK7871.85.S997 2013)

Reference

S. Campbell, Fabrication engineering at the micro and nanoscale, 4th edition
Oxford University Press, 2013 (TK7871.85.C191f 2013)

S.M. Sze, VLSI Technology, 2nd Edition, McGraw Hill, 1988 (TK7874.V871VT 1988)

Y. Chang and S.M. Sze, ULSI Technology, McGraw Hill, 1996 (TK7874.76.U46)

S.K. Ghandhi, VLSI Fabrication Principles: Silicon and Gallium Arsenide, 2nd Edition, John Wiley, 1994 (TK7874.G411 1994)

**NANYANG TECHNOLOGICAL UNIVERSITY
SCHOOL OF MATERIALS SCIENCE AND ENGINEERING**

H.H. Lee, Fundamentals of Microelectronics Processing, McGraw Hill, 1990 (TK7874.L478)

S.M. Sze, Semiconductor Devices: Physics and Technology, 3rd Edition, John Wiley & Sons, 2012/2013 (TK7871.85.S997 2012, TK7871.85.S997 2013)

MS3013 ENVIRONMENTAL EFFECTS ON MATERIALS

Textbook/Reference

Russel H. Jones, Environmental Effects on Engineered Materials, CRC Press 2001.
(Call no: TA418.9.C6E61n, E-book)

Norman S.Allen, Michelle Edge, Fundamentals of Polymer Degradation and Stabilisation, Elsevier Science Publishers, England, 1992 (QD381.9.D47A428)

Anthony Davis, David Sims, Weathering of Polymers, Elsevier Applied Science Publishers Ltd, England, 1983 (TA455.P58D261)

S. Halim Hamid, Mohamad B. Amin, Ali G Maadhah, Handbook of Polymer Degradation, Marcel Dekker, Inc. , 1992 (QD381.9.D47H236 2000)

John Scheirs, Compositional and failure analysis of polymers: a practical approach, John Wiley & Sons, 2000 (TA455.P58S319)

Kenneth R. Trethewey, John Chamberlain, Corrosion for Science and Engineering, 2nd Edition, Longman, 1995 (TA462.T799 1995)

Richard W. Hertzberg, Deformation and Fracture Mechanics of Engineering Materials, 5th Edition, J. Wiley & Sons, 2013 (TA417.6.H576 2013)

MS3014 ANALYSIS OF MATERIALS

Reference

Anthony R. West, Solid State Chemistry and its Applications, Wiley, 1984
(Call no: QD478.W516S)

Cullity, B.D., Stock, S.R., Elements of x-ray diffraction, 3rd Edition, Prentice Hall, 2001.
(QC482.D5C967 2001)

Goldstein, Joseph, Scanning Electron Microscopy and X-Ray Microanalysis , 3rd Edition, Kluwer Academic/ Plenum Publishers, 2003. (QH212.S3S283SEM)

**NANYANG TECHNOLOGICAL UNIVERSITY
SCHOOL OF MATERIALS SCIENCE AND ENGINEERING**

MS3015

MATERIALS ASPECTS IN DESIGN

Textbook/Reference

Michael F. Ashby, *Materials Selection in Mechanical Design*, 4th Edition, Butterworth-Heinemann, 2011 (Call no: TA403.A823M 2011, E-book)

M.F. Ashby, H.R. Shercliff, D. Cebon, *Materials: engineering, science, processing and design*, 3rd Edition, Butterworth Heinemann, 2014 (TA403.A823me 2014)

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SCHOOL OF MATERIALS SCIENCE AND ENGINEERING**

**RECOMMENDED TEXTBOOKS AND REFERENCES
MSE FOURTH YEAR
ACADEMIC YEAR 2016-2017**

MS0002

ENGINEERS AND SOCIETY

Reference

SF Johnston, J P Gostelow, W J King, Engineering and Society : Challenges of Professional Practice, Prentice Hall Inc, USA, 2000. (Call no: TA157.J73)

You Poh Seng, Lim Chong Yah, Singapore: Twenty-Five Years of Development, Nanyang Xingzhou Lianhe Zaobao, Singapore 1984.(DS598.S7S617)

Singapore: Journey into Nationhood, Landmark Books, Singapore, 1998 (DS610.4.S617J)

Yeoh, Joe, To Tame a Tiger: The Singapore Story, Singapore, Wiz-Biz (DS610.4.Y46)

National Archives (Singapore), 10 Years That Shaped a Nation: An Exhibition Catalogue = Jian Guo Shi Nian : Zhan Lan Tu Ji, National Archives of Singapore, 2008 (DS610.7.Y39)

National Library Board, Singapore: The First Ten Years of Independence, 1965 to 1975, National Library Board and National Archives of Singapore, 2007 (DS610.7.S617S)

Websites

- Singapore Government website : <http://www.gov.sg/>
- National Archives of Singapore : <http://www.nas.gov.sg/>
- National Heritage Board : <http://www.nhb.gov.sg/>

MS4012

QUALITY CONTROL

Textbook

William Navidi, Statistics for Engineers and Scientists, 4th Edition, McGraw-Hill Higher Education, 2015 (Call no: QA276.4.N325 2015)

**NANYANG TECHNOLOGICAL UNIVERSITY
SCHOOL OF MATERIALS SCIENCE AND ENGINEERING**

Reference

Dale Besterfield, Quality Improvement, 9th Edition, Pearson, 2013. (TS156.B561 2013)

Ronald E. Walpole [et al.], Probability and Statistics for Engineers and Scientists, 9th Edition, Pearson Prentice Hall, 2012 (TA340.W219 2012)

MS4013

BIOMATERIALS

Textbook/Reference

B.D.Ratner, A.S.Hoffmann, F.J.Schoen, J.E.Lemons, Biomaterials Science: An Introduction to Materials in Medicine, Academic Press, 3rd Edition, 2013 (Call no: R857.M3B615b 2013, E-book)

J.B. Park, R.S. Lakes, Biomaterials: an introduction, Plenum Press, 3rd Edition, 2007. (R857.M3P235 2007, E-book)

MS4014

NANOMATERIALS: FUNDAMENTALS AND APPLICATIONS

Textbook/Reference

Cao Guozhong, Wang Ying, Nanostructures and Nanomaterials: Synthesis, Properties and Applications, World Scientific Publishing, 2nd Edition, 2011 (Call no: QC176.8.N35C235 2011)

Dieter Vollath, Nanomaterials: An Introduction to Synthesis, Properties and Applications, Wiley, 2013 (TA418.9.N35V923)

Kenneth J. Klabunde, Ryan M. Richards, Nanoscale Materials in Chemistry, John Wiley & Sons, 2nd Edition, 2009. (TA418.9.N35N186NMI 2009)

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SCHOOL OF MATERIALS SCIENCE AND ENGINEERING**

**RECOMMENDED TEXTBOOKS AND REFERENCES
MSE YEAR 4 PRESCRIBED ELECTIVES
ACADEMIC YEAR 2016-17**

MS4601 PRINCIPLES OF SEMICONDUCTOR DEVICES

Textbook

S.M. Sze, *Semiconductor Devices : Physics and Technology*, 3rd Edition, John Wiley & Sons, 2013.
(Call no: TK7871.85.S997 2012, TK7871.85.S997 2013-int ed)

S.M. Sze, *Physics of Semiconductor Devices*, 3rd Edition, Wiley, 2007.
(TK7871.85.S997P 2007, E-Book)

B.L. Anderson, *Fundamentals of Semiconductor Devices*, McGraw Hill, 2005.
(TK7871.85.A545F)

Reference

Ben G. Streetman, *Solid State Electronic Devices*, 6th Edition, Prentice Hall, 2006.
(TK7871.85.S915 2006)

G. Parker, *Introductory Semiconductor Device Physics*, Prentice Hall, 1994.
(QC611.P239)

Michael Shur, *Physics of Semiconductor Devices*, Prentice Hall 1990. (QC611.S562)

MS4610 ADVANCED BIOMATERIALS

Textbook/Reference

Temenoff, *Biomaterials: The intersection of biology and materials science*, Pearson, 1st Edition
(Call no: R857.T279)

L.L.Hench, J. Wilson, *An Introduction to Bioceramics*, World Scientific, 1993. (R857.C4I61n 2013)

B.D. Ratner, A.S. Hoffman, F.J. Schoen, J.E. Lemons, *Biomaterials Science: An Introduction to Materials in Medicine*, 3rd Edition, Academic Press, 2013 (R857.M3B615b 2013, E-book)

**NANYANG TECHNOLOGICAL UNIVERSITY
SCHOOL OF MATERIALS SCIENCE AND ENGINEERING**

MS4620

POLYMER TECHNOLOGY

Textbook

R J Crawford, Plastics Engineering, 3rd Edition, Butterworth-Heinemann, 1998
(Call no: TP1120.C899 1998, E-book)

Reference

Zweifel, Hans, Plastics Additives Handbook, 6th Edition, Hanser Publishers, 2009.
(TP1142.P715 2009)

R J Crawford, Plastics Engineering, 3rd Edition, Butterworth-Heinemann, 1998
(TP1120.C899 1998, E-book)

D. H. Morton-Jones, Polymer Processing, Chapman & Hall, 1989 (TP1087.M889)

Joel R. Fried, Polymer Science and Technology, 3rd Edition, Prentice Hall PTR, 2014
(QD381.F899 2014)

MS4631

CORROSION ENGINEERING

Textbook

Pierre R. Roberge, Handbook of corrosion engineering, McGraw-Hill, 2nd Edition, 2012.
(Call no: TA418.74.R638h)

R. Halmshaw, Non-Destructive Testing, 2nd Edition, Edward Arnold, 1991 (TA417.2.H194 1991)

Reference

D. A. Jones, Principles and Prevention of Corrosion, 2nd Edition, Prentice-Hall, 1996
(TA462.J76 1996)

Metals Handbook, Volume 17: Nondestructive Evaluation and Quality Control, ASM International

Barry Hull, Vernon John, Non-Destructive Testing, English Language Book Society, 1988
(TA417.2.H913)

M. G. Fontana, Corrosion Engineering, 3rd Edition, McGraw-Hill, 1987 (TA418.74.F679)

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MS4640

ADVANCED ANALYSIS OF MATERIALS

Textbook

Elton N. Kaufmann, *Characterization of Materials*, John Wiley & Sons, 2003. (E-book)

P.J.Goodhew, F.J.Humphreys, *Electron Microscopy and Analysis*, Taylor & Francis, 3rd Edition, 2001 (QH212.E4G652e 2001)

J.I. Goldstein, D.E. Newbury, P. Echlin, D.C. Joy, C. Fiori, E. Lifshin, *Scanning Electron Microscopy and X-Ray Microanalysis*, 3rd Edition, Kluwer Academic/Plenum Publishers, 2003 (QH212.S3S283sem)

I.A.Watt, *The principles and practice of electron microscopy*, 2nd Edition, Cambridge, 1997 (QH212.E4W344 1997, E-book)

M.H.Loretto, *Electron beam analysis of materials*, 2nd Edition, Chapman & Hall, 1994. (TA417.23.L869)

R. Wiesendanger, *Scanning Probe Microscopy : analytical methods*, Springer-Verlag, 1998. (QH212.S33S283sp)

David B. Williams and C. B. Carter, *Transmission Electron Microscopy – A Textbook for Materials Science*, 1996, Plenum Press, New York.

B. D. Cullity and S. R. Stock, *Elements of X-Ray Diffraction*, 3rd Edition, 2001, Prentice-Hall, Inc.

Reference Book Chapter

“X-ray diffraction, Rietveld crystal structure refinement and high-resolution transmission electron microscopy of nano-structured materials”, *Handbook of Nanoceramics and Their Based Nanodevices*, Vol. 3, p 303-336. American Scientific Publishers 2009, ISBN: 1-58883-117-5.

MS4650

FUNCTIONAL NANOSTRUCTURED MATERIALS

Textbooks/References

Cao Guozhong, *Nanostructures and Nanomaterials -Synthesis, Properties and Applications*, Imperial College Press, 2004

Jacob N Isrealachvili, *Intermolecular surface forces*, second edition, Elsevier, 1991

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MS4651 THIN FILM TECHNOLOGY

Textbook

D.L. Smith, *Thin-film Deposition : Principles and Practice*, McGraw-Hill, 1995.
(Call no: TA418.9.T45.S645)

Milton Ohring, *The Materials Science of Thin Films: Deposition and Structure*, 2nd Edition
Academic press 2002 (TA418.9.T45H38 2002)

**MS4660 FUNDAMENTALS OF INTELLECTUAL PROPERTY IN MATERIALS SCIENCE
AND ENGINEERING**

References

Patent Law for Scientists and Engineers, 2014 Edition, LexisNexis; 2015 edition (9781632819178)

Tina Hart, Simon Clark, Linda Fazzani, *Intellectual Property Law*, Sixth Edition, Palgrave Macmillan, 2013.

Howard B. Rockman, *Intellectual Property Law for Engineers and Scientists*, 04 edition, John Wiley & Sons, Inc, 2004

Basil M. Angelo, Lucas T. Mikeska, Michichiro Izumi, and Koichiro Nakanishi, *Patent Law for Scientists and Engineers*, 2014 Edition, LexisNexis, 2014

Ng-Loy Wee Loon, *Law of Intellectual Property of Singapore* (Thomson Sweet & Maxwell Asia, 2nd edition, 2014)

http://www.wipo.int/academy/en/courses/distance_learning/dl101.html