Bibliography

This bibliography provides additional sources that may be useful for each of the general topics in this course. It is not intended to be an exhaustive list.

Some of the references are to internet sources. Every effort has been made to use URLs that are stable but that is not always possible. A search may be necessary if the URL has changed.

All URLs listed below were verified in April 2017.

1.0 General experimental work

E. Bright Wilson Jr., *An Introduction to Scientific Research*, Dover Publications, New York, 1991. This is a "timeless" book originally published in 1952. Chapters 2 (Searching the Literature) and 12 (Numerical Computations) are completely obsolete but the rest of the book is still a useful collection of materials appropriate to scientific research.

2.0 Machining

John H. Moore, Christopher C. Davis, Michael A. Coplan, Sandra C. Greer, *Building Scientific Apparatus*, fourth edition, Cambridge University Press, New York, 2009. Sections 1.1 through 1.4 deal specifically with machining processes.

Richard R. Kibbe, Roland O. Meyer, Warren T. White, John Neely, Jon Stenerson, Kelly Curran, *Machine Tool Practices (10th Edition)*, Prentice Hall, Upper Saddle River, New Jersey, 2014. The text used in the introductory machining class in the BYU Manufacturing Technology program in 2017.

Eric Obert, *Machinery's Handbook, Toolbox Edition*, 30th edition, Industrial Press, South Norwalk, Connecticut, 2016. Machinery's Handbook is considered the standard reference handbook for the machinist. It has extensive tables, formulas, and figures in its 2896 pages.

Christopher McCauley, *Machinery's Handbook, Pocket Companion*, 30th Edition, Industrial Press, South Norwalk, Connecticut, 2016. This is a collection of the most basic data from the Machinery's Handbook, condensed to 352 pages.

Christopher McCauley, *Shop Reference for Students & Apprentices, Second Edition*, Industrial Press, New York, 2000.

3.0 Computer-aided design

John H. Moore, Christopher C. Davis, Michael A. Coplan, Sandra C. Greer, *Building Scientific Apparatus, fourth edition*, Cambridge University Press, New York, 2009. Sections 1.5 through 1.7 deal specifically with mechanical design and mechanical drawing.

Dennis K. Lieu, Sheryl A. Sorby, *Visualization, Modeling, and Graphics for Engineering Design, 1st Edition*, Delmar Cengage Learning, Clifton Park, New York, 2009. This is the text used for the BYU Computer Aided Design class in 2017.

4.0 LabVIEW and data acquisition

National Instruments has extensive documentation available on their web site at http://www.ni.com/getting-started/. The LabVIEW Basics Getting Started is at http://www.ni.com/getting-started/labview-basics/.

John Essick, *Hands-On Introduction to LabVIEW for Scientists and Engineers, third edition*, Oxford University Press, New York, 2015.

Amazon lists several books for LabVIEW, but most are based on earlier versions of LabVIEW and will not cover the more recently-added features.

5.0 Uncertainty, errors, and noise in experimental measurements

American Association for Laboratory Accreditation, "Guide for Estimation of Measurement Uncertainty in Testing, December 2014," available at https://www.a2la.org/guidance/est_mu_testing.pdf.

National Institute of Standards and Technology (NIST), publication TN1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results," 1994 Edition, https://www.nist.gov/pml/nist-technical-note-1297.

John R. Taylor, *An Introduction to Error Analysis: The Study of Uncertainties in Physical Measurements*, second edition, University Science Books, Herndon, Virginia, 1997 (www.uscibooks.com).

D. C. Baird, *Experimentation: An Introduction to Measurement Theory and Experiment Design*, third edition, Prentice-Hall, Englewood Cliffs, New Jersey, 1995.

Stuart L. Meyer, *Data Analysis for Scientists and Engineers*, John Wiley & Sons, New York, 1975.

Siegmund Brandt, *Data Analysis: Statistical and Computational Methods for Scientists and Engineers, 4th ed.*, Springer, New York, 2014.

Philip Bevington, D. Keith Robinson, *Data Reduction and Error Analysis for the Physical Sciences*, third edition, McGraw-Hill Education, New York, 2002.

Michael Lavine, *Introduction to Statistical Thought*, electronic book available at http://people.math.umass.edu/~lavine/Book/book.pdf.

Wikibooks.org, "Statistics," an online book available at http://en.wikibooks.org/wiki/Statistics.

William Lichten, *Data and Error Analysis*, second edition, Prentice Hall, Upper Saddle River, New Jersey, 1999.

Alex Reinhart, *Statistics Done Wrong: The Woefully Complete Guide*, no starch press, San Francisco, 2015. An electronic version is available at https://www.statisticsdonewrong.com.

6.0 Measurement fundamentals

Measurement Computing, "Data Acquisition Fundamentals: Improving Measurement Quality with Signal Conditioning," http://www.mccdaq.com/support/signal-conditioning-white-paper.aspx. An excellent 41-page white paper describing some of the details for conditioning a signal to obtain high-quality measurements.

National Instruments, "The Engineer's Guide to Signal Conditioning," ftp://ftp.ni.com/evaluation/signal_conditioning/20712_Benefits_of_Integrated_SC_WP_HL.pdf. This is a 12-page white-paper on signal conditioning. It leans somewhat toward designs using National Instruments conditioning hardware. It does have general background information on signal conditioning.

Measurement Computing, "Data Acquisition Handbook," http://www.mccdaq.com/support/Data-Acquisition-Handbook.aspx. The link takes you to a page where you have to register to download the Handbook. Registration is free.

Measurement Computing, "Noise Reduction and Isolation," https://www.mccdaq.com/PDFs/specs/Noise-Reduction.pdf. This is a 10-page white paper covering methods of reducing noise and crosstalk in signals.

National Instruments, "Engineer's Guide to Accurate Sensor Measurements," a white paper describing sensor signal conditioning, linearization, and calibration, ftp://ftp.ni.com/evaluation/daq/25188_Sensor_WhitePaper_IA.pdf.

Keithley, "Overview of Two-Wire and Four-Wire (Kelvin) Resistance Measurements," Application note 3176, http://www.tek.com/sites/tek.com/files/media/document/resources/2110_2Wire4WireKelvinResistanceAppNote.pdf.

Keithley, "Low Level Measurements Handbook," 7th Edition, describing methods for precision measurement of low-level signals http://www.tek.com/sites/tek.com/files/media/document/resources/LowLevelHandbook_7Ed.pdf.

7.0 Temperature measurements

Measurement Computing, "Data Acquisition Fundamentals: Making Accurate Temperature Measurements with Thermocouples, Thermistors and RTD Sensors," http://www.mccdaq.com/support/temperature-white-paper.aspx. This white paper covers some fundamentals for using thermocouples, RTDs and thermistors for temperature measurements.

8.0 Measuring temperature with a silicon diode

Predrag S. Iskrenovic, "Systematic error of diode thermometer," Rev. Sci. Instrum. **84**, 084901, 2009 (https://doi.org/10.1063/1.3202102).

K. Dzinavatonga, "Design and characteriation of a 1N4148 diode-based digital thermometer with single calibration point," J. Inst. **3**, T10001, 2008 (https://doi.org/10.1088/1748-0221/3/10/T10001/).

V. L. Borblik, Yu. M. Shwarts, M. M. Shwarts, "Characteristics of diode temperature sensors which exhibit Mott conduction in low-temperature region," Semicond. Phys. Quantum Electron. Optoelectron. **10**(3), 44-47, 2007 (http://journal-spqeo.org.ua/n3_2007/v10n3-p044-047.pdf).

R. O. Ocaya, "An experiment to profile the voltage, current and temperature behaviour of a P-N diode," Eur. J. Phys. **27**, 625-633, 2006 (https://doi.org/10.1088/0143-0807/27/3/015).

A. P. Rijpma, H. J. M. ter Brake, "Cryogenic thermometry with a common diode: Type BAS16," Cryogenics **46**(1), 68-69, 2006 (https://doi.org/10/1016/j.cryogenics.2005.11.009).

Olfa Kanoun, Hans-Rolf Tränkler, "Model performance improvement for a calibration-free temperature measurement based on p-n junctions," Sens. Actuators A **101**(3), 275-282, 2002 (https://doi.org/10.1016/S0924-4247(02)00207-8).

B. G. Cohen, W. B. Snow, A. R. Tretola, "GaAs p-n Junction Diodes for Wide Range Thermometry," Rev. Sci. Instrum. **34**, 1091-1093, 2004 (https:/doi.org/10.1063/1.1718140).

Tony Huen, "Semiconductor diode low temperature thermometer," Rev. Sci. Instrum. **41**(9), 1368-1369, 2003 (https://doi.org/10.1063/1.1684826).

Yu. M. Shwarts, V. L. Borblik, N. R. Kulish, E. F. Venger, V. N. Sokolov, "Limiting characteristics of diode temperature sensors," Sens. Actuators A **86**(3), 197-204, 200 (https://doi.org/10.1016/S0924-4247(00)00445-3).

9.0 Theory of high-T_C superconductivity

B. Keimer, *et al.*, "High Temperature Superconductivity in the Cuprates," arXiv.org, https://archiv.org/ftp/arxiv/papers/1409/1409.4673.pdf.

Jajil Tahir-Kheli, "Resistance of high-temperature cuprate superconductore," New J. Phys. **15**, 073020, 9 July 2013 (https://doi.org/10.1088/1367-2630/14/7/073020).

Grigorii p. Mikitik, *et al.*, "Analytical Methods and Formulas for Modeling High Temperature Superconductors," IEEE Transactions on Applied Superconductivity **23**(2), 8001920, April 2013 (https://doi.org/10.1109/TASC.2013.2245504). This paper discusses many aspects of the transition except the resistivity.

10.0 Data analysis and curve fitting

Philip Bevington, D. Keith Robinson, *Data Reduction and Error Analysis for the Physical Sciences*, third edition, McGraw-Hill Education, New York, 2002.

Wikipedia, "Non-linear least squares," https://en.wikipedia.org/wiki/Non-linear_least_squares. This article is a good overview of fitting a set of data points with a non-linear model equation. The first three sections are fairly general. The remainder of the article involves specific fitting algorithms and is quite detailed.

11.0 Scientific writing

A. Thompson and B. N. Taylor, "The NIST Guide for the use of the International System of Units" (October 2010), available at https://www.nist.gov/physical-measurement-laboratory/special-publication-811. A pdf copy can be found at http://ws680.nist.gov/publication/get_pdf.cfm?pub_id=200349.

Elizabeth J. Gentry, Georgia L. Harris, "Accuracy Matters," and "Write it Right," originally published at www.qualityprogress.com, May and July 2016, http://ws680.nist.gov/publication/get_pdf.cfm?pub_id=920490.

American Institute of Physics, "Author Resource Center," online resource at https://publishing.aip.org/authors. A pdf copy of the resource document can be found at https://publishing.aip.org/sites/default/files/aippub/files/PreparingMS.pdf. The materials in this guide apply to most of the AIP journals.

American Institute of Physics, "AIP Style Manual" fourth edition (1990), is not longer available from the AIP web site. Most of the content is included in the "Author Resource Center" indicated in the previous entry. There is a copy of the style manual available at https://www.physics.byu.edu/faculty/petersonb/Phys240/AIP_Style_4thed.pdf.

Michael Alley, *The Craft of Scientific Writing*, third edition, Springer, New York, 1996.

Robert V. Smith, Llewellyn D. Densmore, Edward F. Lener, *Graduate Research (Fourth Edition), A Guide for Students in the Sciences*, Academic Press, 2016, http://www.sciencedirect.com/science/book/9780128037492.

12.0 Scientific presentations

Michael Alley, *The Craft of Scientific Presentations*, Springer, New York, 2003.

Robert V. Smith, Llewellyn D. Densmore, Edward F. Lener, *Graduate Research (Fourth Edition), A Guide for Students in the Sciences*, Academic Press, 2016, http://www.sciencedirect.com/science/book/9780128037492.

13.0 Material data sheets

Allegheny Ludlum Altemp-HX, now known as ATI HX from Allegheny Technologies Incorporated, data sheet available at https://www.atimetals.com/Products/Documents/datasheets/nickel-cobalt/nickel-based/ati_altemp_hx_tds_en.pdf.

1N4148 diode, data sheet available at https://www.fairchildsemi.com/datasheets/1N/1N914.pdf.

TL3472 dual operational amplifier, data sheet available at http://www.ti.com/lit/ds/symlink/tl3472.pdf.

2N3906 PNP transistor, data sheet available at http://www.onsemi.com/pub_link/Collateral/2N3906-D.PDF.

14.0 Equipment manuals

National Instruments, "NI 622x Specifications," available at http://www.ni.com/pdf/manuals/375201c.pdf.

National Instruments, "M-series User Manual," available at http://www.ni.com/pdf/manuals/371022l.pdf.

National Instruments, "NI 6040E Family Specifications," available at http://www.ni.com/pdf/manuals/370722c.pdf.

National Instruments, "E-Series User Manual," available at http://www.ni.com/pdf/manuals/370503k.pdf.

National Instruments, "BNC-2120 Connector Block," available at http://www.ni.com/pdf/manuals/372123d.pdf.

Kepco Inc., "Operator's Manual, ATE 1/2 Rack Power supply," (ATE 36-8 among others) available at http://www.kepcopower.com/support/ate-operator-half-rack-r1.pdf.

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