

FALL 2023 Booklist

Recommendation: please consult with the course instructor before purchasing any material.

1004 Hambley Allan R.(2017), **Electrical Engineering Principles and Applications**, New York: Pearson, (7E) ISBN: 978-0134484143.

2024 Hambley, Allan R., **Electrical Engineering Principles and Applications Plus Mastering Engineering with Pearson eText – Access Card Package**, 7th edition, Pearson. ISBN 9780134712871.

Students can opt to purchase:

Book + Modified Mastering access card: 0134680618

or

*SVE + Modified Mastering access card: 0134680626

or

Modified Mastering access card: 0134487001

*SVE= Student Value Edition which is the loose leaf/ three-hole punched version of the text.

Required Hardware:

The Lab-in-A-Box kit previously used in ECE 1004.

2054 (Applied Electrical Theory – ME students only)

Allan R. Hambley, **Electrical Engineering Principles and Applications Plus Mastering Engineering with Pearson eText – Access Card Package**, 7th edition, Pearson. ISBN 978-0134712871.

Students can opt to purchase:

Book + Modified Mastering access card: 0134680618

or

*SVE + Modified Mastering access card: 0134680626

or

Modified Mastering access card: 0134487001

*SVE= Student Value Edition which is the loose leaf/three-hole punched version of the text.

2214 Ellingson, Steven W. **Electromagnetics** (I). i, Blacksburg, VA: VT Publishing, 2018, 225. (Available at: [Electromagnetics, Volume 1 CC BY-SA 4.0.](#)) **Author offers free access to this book.**

Neamen, D. A. **Microelectronics Circuit Analysis and Design** 4th edition, New York: McGraw-Hill Education, 2009, 1392. ISBN: 978-0073380643.

Required Course Materials:

The Lab-in-A-Box kit was previously used in 1004 and 2024.

- 2514 Riley, David, and Kenny A. Hunt. **Computational Thinking for the Modern Problem Solver**. i, Boca Raton Florida: CRC Press, 2014, 405. ISBN: 978-1466587779
Available in the VT online library:

<https://ebookcentral.proquest.com/lib/vt/detail.action?docID=1524329>

Required Software:

1. Modeling and simulation software, such as MATLAB and Simulink.
2. Linux virtual machine and software development environment (open source).
3. Unmanned aircraft simulation and ground station software (open source).

Required Field Equipment:

A technology platform suitable for project-based learning, such as a ready-to-fly quadcopter (provided by the department).

- 2544 M. Morris Mano, Charles R. Kime, Tom Martin, **Logic and Computer Design Fundamentals**, 2015. 5th edition, PEARSON. ISBN 978-0133760637.

2564 **No Textbook Required**

- 2714 Oppenheim, A. V., Willsky, A. S., and Nawab, S. H. **Signals and Systems**. ii, Pearson, 1996, 1000. ISBN: 978-0138147570 or ISBN-10:0138147574

2804 **No Textbook Required**

- 3004 Charles K. Alexander and Matthew N. O. Sadiku, **Fundamentals of Electric Circuits**, 7th edition, McGraw-Hill. ISBN: 978-1260226409.

- 3054 Hambley Allan R., **Electrical Engineering Principles and Application** (7E), New York: Pearson (2017), ISBN: 978-0134484143. Students should have from taking ECE 2054.

- 3074 **No textbook required.** All required materials will be made available electronically.

- 3105 Ellingson, Steven W. (2018) **Electromagnetics, Vol. 1**. Blacksburg, VA: VT Publishing. ISBN: 978-0-9979201-9-2.

Free Electronic Book for students: <https://doi.org/10.21061/electromagnetics-vol-1> **CC BY-SA 4.0**

Author offers free access to this book.

Recommended:

Fawwz T. Ulaby, Umberto Ravaioli, **Fundamentals of Applied Electromagnetics**, 8th edition, Pearson. ISBN 978-0135199008. **NOTE: This ISBN is for the Pearson e-text access card.**

3106 Ellingson, Steven W. (2020) **Electromagnetics, Vol. 2**. Blacksburg, VA: Virginia Tech Publishing. ISBN: 978-1-949373-92-9
Free Electronic Book for students: <https://doi.org/10.21061/electromagnetics-vol-2>. CC BY-SA 4.0

Author offers free access to this book.

Recommended:

Fawwz T. Ulaby, Umberto Ravaioli, **Fundamentals of Applied Electromagnetics**, 8th edition, Pearson. ISBN 9780135199008. **NOTE: This ISBN is for the Pearson e-text access card.**

3204 Donald Neamen, **Microelectronics Circuit Analysis and Design**, 4th edition, McGraw-Hill. ISBN 978-0073380643.

3214 Donald Neamen, **Semiconductor Physics and Devices**, 4th edition, McGraw-Hill. ISBN 978-0073529585

3274 **No textbook required.** ECE Department, **ECE 3274 Lab Manual**. Available on-line.

3304 J. D. Glover and M. S. Sarma, **Power System Analysis and Design**, Cengage Engineering, 6th edition. ISBN 978-1305632134.

Robert W. Erikson and Dragan Maksimovic, **Fundamentals of Power Electronics**, 2nd edition, 2001, Springer Science & Business Media, Inc. ISBN 978-0792372707.

3354 **No textbook required.** ECE Department, **ECE 3354 Lab Manual**. Available on-line.

3504 Patterson, D., & Hennessey, J. (2013). **Computer Organization and Design: The Hardware/Software Interface**. Morgan Kaufmann Publishers Inc. Pp. 800. ISBN 978-0124077263.

Required Software:

Architecture simulator as specified by the instructor. There are several simulators available in the public domain at no cost.

3514 Carrano and Henry, **Data Abstraction and Problem Solving with C++: Walls and Mirrors**, 7th edition. Pearson. ISBN 978-0134463971.

3524 Negus C. (2015). **Linux Bible** (10th edition). Hoboken, NJ: John Wiley & Sons. pp. 912. ISBN 978-1119578888.

Shaw, Z. (2017) **Learn Python 3 the Hard Way: A Very Simple Introduction to the Terrifyingly Beautiful World of Computers and Code**. Addison-Wesley Professional ISBN: 9780134693866 or ISBN:9780134692883

- 3544 John Wakerly (2017), **Digital Design Principles and Practices**, 5th edition. PEARSON, pp 912. ISBN 978-0134460093.
- 3564 James F. Kurose and Keith W. Ross, **Computer Networking: A Top-Down Approach**. Pearson. 8th edition, 2021. ISBN: 978-0135928615.(Was ECE 4614) Electronic Book only. Paper copy available for rental only. ISBN: 978-0136681557
- 3574 David Thomas and Andrew Hunt. **The Pragmatic Programmer**. Addison-Wesley, 2nd edition, 2019. ISBN 978-0135957059.
- 3614 Grami, Ali. **Introduction to Digital Communications**. Academic Press (Elsevier). 2015. Pp. 604. ISBN 978-0124076822.
- 3704 Oppenheim, A. V., Willsky, A. S., and Nawab, S. H. (1996). **Signals and Systems**. Pearson. 2E. pp. 1000. ISBN: 978-0138147570 or ISBN-10:0138147574
- 4104 Pozar, David M. **Microwave Engineering**. John Wiley. 2011.4th edition. Pp. 752. ISBN 9780470631553.
(Co-located with 5104G)
- 4134 Saleh, B. E. A. and Teich, Malvin C. **Fundamentals of Photonics**. 2nd Edition. New York, NY: John Wiley and Sons, 2007, 1177. ISBN: 9780471358329
(Co-located with 5134G)
- 4154 Prolls, G. W., **Physics of The Earth's Space Environment**, (1st Edition), Springer, 2004, 513 pages. 9783642059797
(Co-located with 5164 and cross-listed with AOE)
- 4164 **No textbook required. The textbook is provided in electronic format by the instructor.**
P.M. Kintner and M.L. Psiaki., **Global Positioning System Theory and Design**
3rd Edition.
- 4184 A.F. J. Levi, (2006) **Applied Quantum Mechanics**, Cambridge University Press (pp.1 - 462). 978-0521860963. Paperback ISBN: 9780521183994.
- 4194 W. G. Rees, **Physical Principles of Remote Sensing**, 3rd edition, 2013. Cambridge Univ. Press. ISBN 9780521181167. **(Co-located with 5194)**
- 4205 Sergio Franco, **Design with Operational Amplifiers and Analog Integrated Circuits**, McGraw-Hill, 3rd edition, 2005. ISBN 9780072320848.
- 4220 Behzad Razavi, **Design of Analog CMOS Integrated Circuits**, McGraw-Hill, 2nd edition, 2016. ISBN: 9780072524932.

4224 Robert W. Erikson and Dragan Maksimovic, **Fundamentals of Power Electronics**, 2nd edition, 2001, Springer. ISBN 9780792372707.
***PDF version available on-line. Free for students. Ask the instructor.**

4324 **No Textbook Required**

4334 J. D. Glover and M. S. Sarma, **Power System Analysis and Design**, Cengage Engineering, 6th edition. ISBN 9781305632134.

4414/CS 4224 co-located with ECE 5414/CS 5264.

Love, R. **Linux Kernel Development** 3E. Upper Saddle River, NJ: Addison-Wesley. 2010. Pp. xxv, 440. ISBN: 9780672329463

Recommended:

-Bovet, D. P., & Cesati, M. (2005). **Understanding the Linux Kernel** 3E. Sebastopol, CA: O'Reilly. Pp. xvi, 944. ISBN: 978-0596005658

-Corbet, J., Rubini, A., & Kroah-Hartman, G. **Linux Device Drivers** (3rd ed.). 2005. Sebastopol, CA: O'Reilly. Pp xvii, 640. ISBN: 978-0596005900

-Love, R. **Linux System Programming: Talking Directly to the Kernel and C Library**. 2E, 2013. Sebastopol, CA: O'Reilly. Pp. xx, 456. ISBN-13: 978-1449339531.

-Mauerer, W. **Professional Linux Kernel Architecture** (1st ed.). 2008. Indianapolis, IN: Wiley. Pp xxx, 1368. ISBN: 978-0470343432

4424 **The CS instructor will use these texts Fall 2023:**

Required:

Christopher M. Bishop, **Pattern Recognition and Machine Learning**.(2nd ed.).Springer. ISBN: 978-0387310732

Recommended:

Trevor Hastie, Robert Tibshirani, Jerome Friedman, **The Elements of Statistical Learning: Data Mining, Inference, and Prediction**. (2nd ed.) Springer. ISBN: 978-0387848570

Ian Goodfellow, Yoshua Bengio, Aaron Courville, **Deep Learning**. The MIT Press. 2016. ISBN: 978-0262035613

ECE sections will use:

Recommended:

Kevin Murphy, **Probabilistic Machine Learning: An introduction**. MIT Press, 2022. ISBN 9780262046824.

Marc Deisenroth, **Mathematics for Machine Learning**, 1 Edition. Cambridge University Press, 2020. ISBN: 9781108455145
(Cross-listed with CS 4824)

4524 Stuart Russell and Peter Norvig, **Artificial Intelligence: A Modern Approach**, 4th Edition, 2020. 1152 pp. Pearson. ISBN: 9780134610993.

4525 Mat Buckland, **Programming Game AI by Example**, Wordware Game Developers Library, 1st Ed. 2004. ISBN-9781556220784

4540 Weste and Harris, **CMOS VLSI Design: A Circuits and Systems Perspective**, 4th edition, 2010. Pearson. ISBN 978-0321547743. Also available in eText version ISBN: 9780133001471.

4554 Richard Szeliski, **Computer Vision: Algorithms and Applications**, 2nd edition, Springer, 2022. ISBN 9783030343712. **(Colocated with 5554)**
Available at no cost in a PDF format: <http://szeliski.org/Book/>

4560 Ed Skoudis with Tom Liston, **Counter Hack Reloaded**, 2nd edition, Prentice-Hall. ISBN 9780131481046.

4564 **No cost to students** (Full-texts available thru VT Library Safari service)

S. Monk, **Programming the Raspberry Pi: Getting Started with Python**, Tab Books, 2012. (ISBN 978-0071807838).

B. Rhodes and J. Goerzen, **Foundations of Python Network Programming**, Apress, 3rd ed., 2014, ISBN 9781430258544

TJ O'Connor, **Violent Python : A Cookbook for Hackers, Forensic Analysts, Penetration Testers and Security Engineers**, Elsevier/Syngress, 2012, ISBN 978-1597499644

P. Waher, **Learning Internet of Things**, Packt Publishing, 2015, ISBN 978-1783553532

Other resources will be available from on-line sites including the Virginia Tech Library's e-book and full-text database offerings.

Each student will receive the following hardware for use during the semester:
Raspberry Pi 3 - Model B
32 GB MicroSD Card
Power Supply with micro-USB Cable

4574 **No Textbook Required**

- 4580** R. C. Gonzalez & R. E. Woods, **Digital Image Processing**, 4th edition, PEARSON. ISBN 9780133356724.
- 4584** **ME teaches. No textbook required. Instructor teaches from Modern Robotics, which is available free online. Fall 23.**
Students will be provided with copies of these workbooks.
- Student Workbook: Robotics Experiment with Serial Robots
 - Student Workbook: Programming of Mobile Robots
- 4624** J. G. Proakis and D. G. Manolakis, **Digital Signal Processing: Principles, Algorithms, and Applications**, 4th edition, PEARSON, 2006. ISBN 9780131873742.
- 4634** Ali Grami, **Introduction to Digital Communications**, Academic Press(Elsevier), 1st, 2015. ISBN 9780124076822.
- 4664** **No Textbook Required**
- 4684** Mung Chiang, **Networked Life: 20 Questions and Answers**, Cambridge UK: Cambridge University Press, September 2012, 503. ISBN: 9781107024946
- Recommended:**
David Easley and John Kleinberg, **Networks, Crowds and Markets: Reasoning About A Highly Connected World**, Cambridge UK: Cambridge University Press, 2010, 744.
- Martin E. Newman, **Networks: An Introduction**, Oxford UK: Oxford University Press, 2010, 720.
- 4805 & 4806 (Senior Design Project)**
Patrick Lencioni, **The 5 Dysfunctions of a Team**. John Wiley & Sons. 1st. 2010. ISBN: 978-0787960759.
- 5014** **No Textbook Required**
Online Articles:
Whitfield, J.D., Yan, J., Wang, W., Heath, J.T., and Harrison, B., 2022. Quantum Computing 2022. arXiv preprint arXiv:2201.09877 <https://arxiv.org/abs/2201.09877>
- Scranton, Philip. "Technology, science and American innovation." Business History 48, no. 3 (2006): 311-331
<https://www.tandfonline.com/doi/full/10.1080/00076790600791763>
- 5104G** Pozar, David M., **Microwave Engineering**. John Wiley. 2011.4th edition. Pp. 752. ISBN 9780470631553.
(Co-located with 4104)
- 5105** Balanis, Constantine A., **Advanced Engineering Electromagnetics**, 2nd Edition, Arizona State University, Wiley. ISBN 9780470589489

Recommended:

Sarabandi, Kamal (2022) **Foundations of Applied Electromagnetics**, The University of Michigan. ISBN 978-1-60785-819-5

Free Electronic Book for students:

<https://services.publishing.umich.edu/publications/ee/#foundations-applied-electromagnetics>

Author offers free access to this book.

- 5134G** Saleh, B. E. A. and Teich, Malvin C. **Fundamentals of Photonics**. 2nd Edition. New York, NY: John Wiley and Sons, 2007, 1177. ISBN: 9780471358329
(Co-located with 4134)
- 5154** Udd, Eric, and William B. Spillman, Jr. **Fiber Optic Sensors: An Introduction for Engineers and Scientists**. 2nd Edition. John Wiley, 2011, 491 pages. ISBN: 9780470126844
- 5164** Prohss, G. W., **Physics Of The Earth's Space Environment**, (1st Edition), Springer, 2004, 513 pages. 9783642059797
(Co-located with 4154/AOE 4654)
- 5174** **Taught by AOE. Check with instructor.**
F. F. Chen, **Introduction to Plasma Physics and Controlled Fusion**, 3rd edition. Springer. ISBN 9783319223087.
(Cross-listed and taught by AOE)
- 5194** W. G. Rees, **Physical Principles of Remote Sensing**, 3rd Edition, 2013. Cambridge Univ. Press. ISBN 9780521181167. **(Co-located with 4194)**
- 5204** Baliga, G. J., **Fundamentals of Power Semiconductor Devices**, 2nd edition. 2018. Springer. ISBN: 9783319939872.
- 5234** **Recommended:**
Henry Ott, **Electromagnetic Compatibility Engineering**, 1st edition, John Wiley. ISBN 9780470189306.
- 5254** **No Textbook Required.**
- 5314** A. J. Wood and B. F. Wollenberg, **Power Generation, Operation, and Control**, John Wiley, 2013, 3rd edition. ISBN 9780471790556.
- 5414/CS 5264. Co-located with ECE 4414/CS 4224**
Love, R. **Linux Kernel Development** (3rd ed.). Upper Saddle River, NJ: Addison-Wesley. 2010. Pp. xxv, 440. ISBN: 9780672329463

Recommended:

- Bovet, D. P., & Cesati, M. (2005). Understanding the Linux Kernel (3rd ed.). Sebastopol, CA: O'Reilly. Pp. xvi, 944. ISBN: 978-0596005658
- Corbet, J., Rubini, A., & Kroah-Hartman, G. (2005). Linux Device Drivers (3rd ed.). Sebastopol, CA: O'Reilly. Pp xvii, 640. ISBN: 978-0596005900
- Love, R. (2013). Linux System Programming: Talking Directly to the Kernel and C Library, (2nd ed.). Sebastopol, CA: O'Reilly. Pp. xx, 456. ISBN-13: 978-1449339531.
- Mauerer, W. (2008). Professional Linux Kernel Architecture, (1st ed.). Indianapolis, IN: Wiley. Pp xxx, 1368. ISBN: 978-0470343432

5424 Kevin Murphy, Machine Learning: A Probabilistic Perspective, MIT Press, 2012. 1st Ed. ISBN 9780262018029. **The ECE instructor will use this textbook for Fall 23**

No textbook required for section taught by CS.

5480 Pfleeger, C., Pfleeger, S., & Margulies, J. (2015). Security in Computing, 5th ed. Prentice Hall. Pp. xxxiii, 944. ISBN: 9780134085043 **(on-line – MIT only)**

5484 L. Null and J. Lobur, The Essentials of Computer Organization and Architecture, 5th edition, Jones and Bartlett Publishers. ISBN 9781284123036 **(on-line – MIT only)**

5485 James F. Kurose and Keith W. Ross, Computer Networking: A Top-Down Approach Featuring the Internet, Pearson. 7th edition, 2016. ISBN: 9780133594140.

or

James F. Kurose and Keith W. Ross, Computer Networking: A Top-Down Approach, Pearson. 8th edition, 2021. ISBN: 978-0135928615. Electronic Book only. Paper copy available for rental only. ISBN: 978-0136681557 **(on-line – MIT only)**

5504 **No Textbook Required. Cross-listed with CS.**

5510 **Taught by CS.**

Maurice Herlihy, Nir Shavit, Victor Luchangco, and Michael Spear, The Art of Multiprocessor Programming, Morgan Kauffman, 2E. 2020. ISBN 9780124159501. **(Cross-listed-CS teaches Fall 23)**

5554 Richard Szeliski, Computer Vision: Algorithms and Applications, 2nd edition, Springer, 2022. ISBN 978-3-030-34371-2. **(Co-located with 4544)**
Available at no cost in a PDF format: <http://szeliski.org/Book/>

5560/CS 5560

William Stallings, Cryptography and Network Security – Principles and Practices, 8th edition, Pearson, 2019. ISBN: 9780135764039. *This ISBN is for the Pearson eText access card, no desk copies available*

NOTE: Pearson eText is a fully digital delivery of Pearson content and should only be purchased when required by your instructor. This ISBN is for the Pearson eText access card. In addition to your purchase, you will need a course invite link, provided by your instructor, to register for and use Pearson eText.

**5565 Taught by CS. Check with instructor.
(Cross-listed with CS)**

The required textbook is (only) available online for free:

Larry Peterson and Bruce Davie. Computer Networks; A Systems Approach.
<https://book.systemsapproach.org/>.

Recommended:

James F. Kurose and Keith W. Ross, **Computer Networking: A Top-Down Approach**, Pearson. 8th edition, 2021. ISBN: 978-0135928615. Electronic Book only. Paper copy available for rental only. ISBN: 978-0136681557

5584 Taught by CS.

Charlie Kaufmann, Radia Perlman, Mike Speciner. **Network Security: Private Communication in a Public World**, (Second Edition), Prentice Hall. 9780130460196

Other lecture materials will be provided on Canvas.

5585 (IT Security & Trust – MIT only)

Ed Skoudis. **CounterHack Reloaded: A Step by Step Guide to Computer Attacks and Effective Defenses**, 2nd edition, Prentice Hall. ISBN 9780132704533. **(on-line – MIT only)**

5605 Alberto Leon-Garcia, **Probability & Random Processes for Electrical Engineering**, 3rd edition, 2008, Addison-Wesley. ISBN: 9780131471221 **Cross-listed with BMES.**

5635 Mark A. Richards, James A. Scheer, William A. Holm, **Principles of Modern Radar: Basic Principles**, SciTech Publishing, Raleigh, NC. 1E. 2010, ISBN 9781891121524.

5674 Jeffrey H. Reed, **Software Radio, A Modern Approach to Radio Design**, 1E, 2002. Prentice-Hall. ISBN 9780130811585.

**5704 Taught by ME.
No textbook required.**

5744 Wilson J. Rugh, **Linear Systems Theory**, 2nd edition, Prentice-Hall. ISBN 9780134412054.
(Cross-listed with ME and AOE)

5754 Taught by ME. Check with instructor.

Williams and Lawrence, **Linear State-Space Control Systems**, 1st edition, 2007. John Wiley. **(Cross-listed with ME and AOE) ME teaches -Fall 2023. Book available for free in pdf format. See professor for link.**

5774 H. Kahlil, **Nonlinear Systems**, 3rd edition. Pearson. 2002. ISBN 9780130673893.
AOE teaches- Fall 2023. (Cross-listed with ME and AOE)

5805 Patrick Lencioni, **The 5 Dysfunctions of a Team**. John Wiley & Sons. 1st. 2010. ISBN: 978-0787960759.

5944 **No Textbook Required**

5984 **Data Engineering Project (MIT)-N. Tryfona**
No Textbook Required

5984 **Advanced Network Science-W. Saad-co-located with ECE 4684**
Mung Chiang, **Networked Life: 20 Questions and Answers**, Cambridge UK:
Cambridge University Press, September 2012, 503. ISBN: 9781107024946

Recommended:

David Easley and John Kleinberg, **Networks, Crowds and Markets: Reasoning About A Highly Connected World**, Cambridge UK: Cambridge University Press, 2010, 744.

Martin E. Newman, **Networks: An Introduction**, Oxford UK: Oxford University Press, 2010, 720.

5984 **Special Study: Nonlinearity & Prediction. Lenny Smith**
No textbook required. Consult with the instructor for the list of recommended texts.

5984 **Brain-Inspired Computer Architecture-J. Paul**
No Textbook Required

5984 **Trustworthy ML-R. Jia**
No Textbook Required

5984 **Bioelectronics-Xiaoting Jia**
No Textbook Required

Recommended:

J. H. Martin et al., **in Principles of Neuroscience**, edited by E. R. Kandel, J.H.Schwartz, and T. J. Jessel (Norwalk: Appleton and Lange, 2000), p. 340-352. ISBN: 9780071390118

Madou, M.J., **Fundamentals of Microfabrication** 2nd or 3rd edition, ISBN: 9780849308260

Wong, William S. and Salleo, Alberto. **Flexible Electronics: Materials and Applications** (Electronic Materials: Science & Technology), (Paperback - Dec 8, 2010) Springer, 480pp Liens Moodle. ISBN: 9780387743622

5984 Special Study: Math Methods for ECE. Zin Lin

Oppenheim, A. V., Willsky, A. S., and Nawab, S. H. (1996). **Signals and Systems**. Pearson. 2E. pp. 1000. ISBN: 9780138147570

6104 TS: Biomedical Optical Imaging-Yizheng Zhu

Mertz, Jerome. **Introduction to Optical Microscopy**, ii, New York, Cambridge University Press, 2019, 462 pages. ISBN: 9781108428309

6354 P. W. Sauer and M. A. Pai, **Power System Dynamics and Stability**. Wiley-IEEE Press; 2 edition (September 25, 2017). ISBN 9781119355779

6554 No Textbook Required

6564 No Textbook Required

6604 TS: 5-G Advanced, O-RAN, and 6G-N. Tripathi/J. Reed
No Textbook Required