

## FALL 2024 Booklist in Progress

*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: 9780134484143.

**2024** Hambley, Allan R.(2017), Electrical Engineering Principles and Applications, New York: Pearson, (7E) ISBN: 9780134484143.

### **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, 7<sup>th</sup> 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.

**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: 9780073380643.

### **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: 9781466587779  
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. 5<sup>th</sup> edition, PEARSON. ISBN: 9780133760637.

**2564** **No textbook required**

**2714** Oppenheim, A. V., Willsky, A. S., and Nawab, S. H. **Signals and Systems**. ii, Pearson, 1996, 1000. ISBN: 9780138147570

**2804** **No textbook required**

**3004** Charles K. Alexander and Matthew N. O. Sadiku, **Fundamentals of Electric Circuits**, 7<sup>th</sup> edition, McGraw-Hill. ISBN: 9781260226409.

**3054** Hambley Allan R., **Electrical Engineering Principles and Application** (7E), New York: Pearson (2017), ISBN: 9780134484143.  
**Students should have from taking 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: 9780997920192.  
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: 9780135199008. **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: 9781949373929  
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**, 4<sup>th</sup> edition, McGraw-Hill. ISBN: 9780073380643.
- 3214** Donald Neamen, **Semiconductor Physics and Devices**, 4<sup>th</sup> edition, McGraw-Hill. ISBN: 9780073529585
- 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: 9781305632134.
- Robert W. Erikson and Dragan Maksimovic, **Fundamentals of Power Electronics**, 2<sup>nd</sup> edition, 2001, Springer Science & Business Media, Inc. ISBN: 9780792372707.
- 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: 9780124077263.

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**, 7<sup>th</sup> edition. Pearson. ISBN: 9780134463971.
- 3544** John Wakerly (2017), **Digital Design Principles and Practices**, 5<sup>th</sup> edition. PEARSON, pp 912. ISBN: 9780134460093.
- 3564** James F. Kurose and Keith W. Ross, **Computer Networking: A Top-Down Approach**. Pearson. 8<sup>th</sup> edition, 2021. ISBN: 9780135928615.(Was ECE 4614) Electronic Book only. Paper copy available for rental only. ISBN: 9780136681557
- 3574** David Thomas and Andrew Hunt. **The Pragmatic Programmer**. Addison-Wesley, 2<sup>nd</sup> edition, 2019. ISBN: 9780135957059.

***Recommended:***

Martin, Robert C. (2009). **Clean Code**, Pearson, ISBN: 9780132350884

Hunt, Andrew and Thomas, David, (2000). **The Pragmatic Programmer**. Addison Wesley. ISBN: 9780201616224

**3614** Grami, Ali. **Introduction to Digital Communications**. Academic Press (Elsevier). 2015. Pp. 604. ISBN: 9780124076822.

**3704** Oppenheim, A. V., Willsky, A. S., and Nawab, S. H. (1996). **Signals and Systems**. Pearson. 2E. pp. 1000. ISBN: 9780138147570

**4104** Pozar, David M. **Microwave Engineering**. John Wiley. 2011.4<sup>th</sup> 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**, (1<sup>st</sup> Edition), Springer, 2004, 513 pages. ISBN: 9783642059797

**(Co-located with 5164 and cross-listed with AOE 4654)**

**4194** W. G. Rees, **Physical Principles of Remote Sensing**, 3<sup>rd</sup> edition, 2013. Cambridge Univ. Press. ISBN: 9780521181167. **(Co-located with 5194)**

**4205** Sergio Franco, **Design with Operational Amplifiers and Analog Integrated Circuits**, McGraw-Hill, 3<sup>rd</sup> edition, 2005. ISBN: 9780072320848.

**4220** Behzad Razavi, **Design of Analog CMOS Integrated Circuits**, McGraw-Hill, 2<sup>nd</sup> edition, 2016. ISBN: 9780072524932.

**4224** Robert W. Erikson and Dragan Maksimovic, **Fundamentals of Power Electronics**, 2<sup>nd</sup> 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, 6<sup>th</sup> edition. ISBN: 9781305632134.

**4424** **The CS instructor will use these texts Fall 2024:**

***Required:***

Christopher M. Bishop, Pattern Recognition and Machine Learning.(2nd ed.).Springer. ISBN: 9780387310732

***Recommended:***

Trevor Hastie, Robert Tibshirani, Jerome Friedman, **The Elements of Statistical Learning: Data Mining, Inference, and Prediction.** (2nd ed.) Springer. ISBN: 9780387848570

Ian Goodfellow, Yoshua Bengio, Aaron Courville, **Deep Learning.** The MIT Press. 2016. ISBN: 9780262035613

**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)**

- 4520** Laung-Terng Wang, Cheng-Wen Wu and Xiaoqing Wen, **VLSI Test Principles and Architectures,** 1<sup>st</sup> Ed., 2006. Morgan Kaufmann, ISBN: 9780123705976.  
**(Co-located with 5505)**

***Optional:***

Niraj Jha and Sandeep Gupta, **Testing of Digital Systems,** Cambridge University Press, 2003. ISBN: 9780521773560.

Miron Abramovici, Melvin A. Greuer, Arthur D. Friedman, **Digital Systems Testing & Testable Design,** 1999, 1<sup>st</sup> Ed. Wiley- IEEE. ISBN: 9780780310629.

- 4524** Stuart Russell and Peter Norvig, **Artificial Intelligence: A Modern Approach,** 4<sup>th</sup> Edition, 2020. 1152 pp. Pearson. ISBN: 9780134610993.
- 4525** Mat Buckland, **Programming Game AI by Example,** Wordware Game Developers Library, 1<sup>st</sup> Ed. 2004. ISBN: 9781556220784
- 4540** Weste and Harris, **CMOS VLSI Design: A Circuits and Systems Perspective,** 4<sup>th</sup> edition, 2010. Pearson. ISBN: 9780321547743. Also available in eText version ISBN: 9780133001471.
- 4554** Richard Szeliski, **Computer Vision: Algorithms and Applications,** 2nd edition, Springer, 2022. ISBN: 9783030343712. **(Co-located with 5554)**  
**Available at no cost in a PDF format: <http://szeliski.org/Book/>**
- 4560** Ed Skoudis with Tom Liston, **Counter Hack Reloaded,** 2<sup>nd</sup> 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: 9780071807838

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: 9781597499644

P. Waher, **Learning Internet of Things**, Packt Publishing, 2015, ISBN: 9781783553532

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 24.**

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**, 4<sup>th</sup> edition, PEARSON, 2006. ISBN: 9780131873742.

**4634** Ali Grami, **Introduction to Digital Communications**, Academic Press(Elsevier), 1<sup>st</sup>, 2015. ISBN: 9780124076822.

**4664** No textbook required.

**4805 & 4806 (Senior Design Project)**

Patrick Lencioni, **The 5 Dysfunctions of a Team**. John Wiley & Sons. 1<sup>st</sup>. 2010. ISBN: 9780787960759.

**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. 2011.4<sup>th</sup> 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:***

**Author offers free access to this book.**

Sarabandi, Kamal (2022) **Foundations of Applied Electromagnetics**, The University of Michigan. ISBN 9781607858195

Free Electronic Book for students:

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

**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)**

**5144** Ting-Chung Poon and Taegeun Kim, **Engineering Optics with Matlab**, 2<sup>nd</sup> edition, World Scientific, 2018. ISBN: 9789813100008.

**5164** Prolss, G. W., **Physics Of The Earth's Space Environment**, (1<sup>st</sup> Edition), Springer, 2004, 513 pages. ISBN: 9783642059797  
**(Co-located with 4154/AOE 4654/AOE 5654)**

**5194** W. G. Rees, **Physical Principles of Remote Sensing**, 3<sup>rd</sup> Edition, 2013. Cambridge Univ. Press. ISBN: 9780521181167. **(Co-located with 4194)**

**5204** Baliga, G. J., **Fundamentals of Power Semiconductor Devices**, 2<sup>nd</sup> edition. 2018. Springer. ISBN: 9783319939872.

**5234 *Recommended:***

Henry Ott, **Electromagnetic Compatibility Engineering**, 1st edition, John Wiley. ISBN: 9780470189306.

- 5254 **No textbook required.**
- 5324 Stoll, Harry G., **Least-Cost Electric Utility Planning**, Wiley-Interscience. 1989. ISBN: 9780471636144.
- 5424 Kevin Murphy, **Machine Learning: A Probabilistic Perspective**, MIT Press, 2012. 1<sup>st</sup> Ed. ISBN: 9780262018029.
- 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**, 5<sup>th</sup> 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: 9780135928615. Electronic Book only. Paper copy available for rental only. ISBN: 9780136681557 **(on-line – MIT only)**
- 5504 **No textbook required. Taught by ECE Fall 2024**  
**Cross-listed with CS 5504**
- 5505 Laung-Terng Wang, Cheng-Wen Wu and Xiaoqing Wen, **VLSI Test Principles and Architectures**, 1<sup>st</sup> Ed., 2006. Morgan Kaufmann, ISBN: 9780123705976.  
**(Co-located with 4520)**
- Optional:*  
Niraj Jha and Sandeep Gupta, **Testing of Digital Systems**, Cambridge University Press, 2003. ISBN: 9780521773560.
- Miron Abramovici, Melvin A. Greuer, Arthur D. Friedman, **Digital Systems Testing & Testable Design**, 1999, 1<sup>st</sup> Ed. Wiley- IEEE. ISBN: 9780780310629.
- 5510 **Taught by ECE Fall 2024**  
Maurice Herlihy, Nir Shavit, Victor Luchangco, and Michael Spear, **The Art of Multiprocessor Programming**, Morgan Kauffman, 2E. 2020. ISBN: 9780124159501.  
**(Cross-listed with CS 5510)**
- 5554 Richard Szeliski, **Computer Vision: Algorithms and Applications**, 2nd edition, Springer, 2022. ISBN: 9783030343712. **(Co-located with 4554)**  
**Available at no cost in a PDF format: <http://szeliski.org/Book/>**



**5560/CS 5560**

William Stallings, **Cryptography and Network Security – Principles and Practices**, 8<sup>th</sup> 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 ECE. 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/>.

**5584 Taught by CS. Check with instructor.**

Charlie Kaufmann, Radia Perlman, Mike Speciner. **Network Security: Private Communication in a Public World**, (Second Edition), Prentice Hall. ISBN: 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**, 2<sup>nd</sup> edition, Prentice Hall. ISBN: 9780132704533. **(on-line – MIT only)**

**5605 Alberto Leon-Garcia, Probability & Random Processes for Electrical Engineering, 3<sup>rd</sup> edition, 2008, Addison-Wesley. ISBN: 9780131471221 Cross-listed with BMES 5525.**

**5644 Han, Z., Niyato, D., Saad, W., Başar, T., & Hjørungnes, A. (2012). Game Theory in Wireless and Communication Networks: Theory, Models, and Applications. Cambridge, UK. Cambridge University Press. Pp. xv, 554. ISBN: 9780521196963**

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

**5694 No textbook required.**

***Recommended:***

Smith, L.A. (2007) **Chaos: A Very Short Introduction**. OUP. Oxford, UK.

**Various papers:**

Bayarri, M.J. et al (2015) Probabilistic quantification of hazards, International Journal for Uncertainty Quantification, 5 (4) 297-325

Berger, J.O. & L.A. Smith (2018) On the statistical formalism of uncertainty quantification, Annual Review of Statistics and Its Application, DOI: 10.1146/annurev-statistics-030718-105232.

Good, I.J. (1959) "Kinds of probability," Science, vol. 129 pp. 443-447.

Hagedorn, R. & L.A. Smith (2009) Communicating the value of probabilistic forecasts with weather roulette, Meteorol. Appl., 16 (2): 143-155.

Judd, K., C.A. Reynolds, T.E. Rosmond & L.A. Smith (2008) The Geometry of Model Error, J. Atmos. Sci., 65 (6): 1749-1772.

Judd, K. & L.A. Smith (2004) Indistinguishable States II: The Imperfect Model Scenario, Physica D, 196: 224-242.

Thompson, E.L. and Smith, L.A. (2019) Escape from model-land. Economics Discussion Papers, No 2019-23, Kiel Institute for the World Economy.  
<http://www.economics-ejournal.org/economics/discussionpapers/2019-23>.

**5704 Taught by ME. Check with instructor.**  
**No textbook required.**

**5744** Wilson J. Rugh, **Linear Systems Theory**, 2<sup>nd</sup> 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**, 1<sup>st</sup> edition, 2007. John Wiley. **(Cross-listed with ME and AOE) ME teaches -Fall 2024. Book available for free in pdf format. See professor for link.**

**5774** H. Kahlil, **Nonlinear Systems**, 3<sup>rd</sup> edition. Pearson. 2002. ISBN: 9780130673893.  
**AOE teaches- Fall 2024. (Cross-listed with ME and AOE)**

**5805** Patrick Lencioni, **The 5 Dysfunctions of a Team**. John Wiley & Sons. 1<sup>st</sup>. 2010. ISBN: 9780787960759.

**5944 No textbook required**

**5984 Special Study: 5-G Advanced, O-RAN, and 6G-N. Tripathi/J. Reed**  
**No textbook required.**

**5984 Special Study: Industry Topics and Professionalism. A. Boker**  
**No textbook required.**

**5984 Modern Binary Exploitation- Ravindran, B.**  
**No textbook required**

***Recommended:***

Erickson, J. (2008). **Hacking: The Art of Exploitation**, No Starch Press, 488 pages, ISBN: 9781593271442.

Anley, C, Heasman J, Lindner F, Richarte G. (2007). **The Shellcoder's Handbook: Discovering and Exploiting Security Holes**, Wiley, 752 pages, ISBN: 9780470080238.

Yurichev, D. (2013). **Reverse engineering for beginners**. <https://beginners.re/>

**5984 Special Study: Brain-Inspired Computer Architecture-J. Paul**  
**No textbook required.**

**5984 Special Study: Nonlinearity & Prediction- L. Smith**  
**No textbook required.**

**5984 Special Study: Critical Eng of Emerging Tech- K. Giles**  
**No textbook required.**

**5984 Special Study: Data Engineering Project (MIT)-N. Tryfona**  
**No textbook required.**

**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

**6104 TS: Latest Advances in Optical Sensing- A. Wang**  
**No textbook required.**

**6214** Jia-Ming Liu, **Photonic Devices**, Cambridge Univ. Press, June 11, 2009. ISBN:  
9780521558594

**6314** **No textbook required. Notes provided by the instructor.**

**6514** **No textbook required.**

**6554** **No textbook required.**

**6634** **No textbook required.**