FALL 2024 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: 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**, 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.

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. 5th 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**, 7th 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**, 4th edition, McGraw-Hill. ISBN: 9780073380643.

3214 Donald Neamen, **Semiconductor Physics and Devices,** 4th 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**, 2nd 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**, 7th edition. Pearson. ISBN: 9780134463971.

3544 John Wakerly (2017), **Digital Design Principles and Practices**, 5th edition. PEARSON, pp 912. ISBN: 9780134460093.

3564 James F. Kurose and Keith W. Ross, **Computer Networking: A Top-Down Approach**. Pearson. 8th 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, 2nd 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. 2011.4th 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 Prolss, G. W., **Physics of The Earth's Space Environment**, (1st 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**, 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.

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**, 1st 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, 1st Ed. Wiley- IEEE. ISBN: 9780780310629.

4524 Stuart Rusell 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: 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**, 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: 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**, 4th edition, PEARSON, 2006. ISBN: 9780131873742.

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

4664 **No textbook required.**

4805 & 4806 (Senior Design Project)
Patrick Lencioni, **The 5 Dysfunctions of a Team**. John Wiley & Sons. 1st. 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. 2011.4th 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:
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**, 2nd edition, World Scientific, 2018. ISBN: 9789813100008.

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

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

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. 1st Ed. ISBN: 9780262018029.

5480 Pfleeger, Charles P., Shari Lawrence Pfleeger, and Lizzie Coles-Kemp. 2024. **Security in Computing.** Sixth edition. (1040 pages) . Boston: Addison-Wesley Professional. ISBN: 978-0137891214 (on-line – MIT only)
Available free online:
https: //www.oreilly.com/library/view/-/9780137891375/.

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: 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**, 1st 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, 1st 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,** 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 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 Kaufmanm, 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**, 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 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**, 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 2024. 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 2024. (Cross-listed with ME and AOE)

5805 Patrick Lencioni, **The 5 Dysfunctions of a Team**. John Wiley & Sons. 1st. 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.**