Spring 2022 Book List

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

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

2024 Centeno, Virgilio A., **Electrical Circuits and Devices,** Great River Learning – Customer Solutions Team. 2021. **ISBN:** 978-1644966778

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.

2164 J. J. Sellers, **Understanding Space: An Introduction to Astronautics** (3rd Edition), McGraw Hill, 2005. ISBN: 9780077230302
CROSS LISTED WITH AOE 2664

2214 Ellingson, Steven W. **ELECTROMAGNETICS** (I). Blacksburg, VA: VT Publishing, 2018, 225. (Available at: https://doi.org/10.21061/electromagnetics-vol-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 that 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. ISB: 9781466587779
Available on the VT online library:
http://proquest.safaribooksonline.com.ezproxy.lib.vt.edu/9781466587793)

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: 978-0138147570 or ISBN-10:0138147574

2804 **No textbook required.**

3004 Charles K. Alexander and Matthew N. O. Sadiku, **Fundamentals of Electric Circuits**, 6th edition, McGraw-Hill. ISBN: 978-0078028229.

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.

3104 **No textbook required. Will use notes and public domain information.**

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 eText 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 978-0135199008. **NOTE: This ISBN is for the Pearson eText access card.**

3134 Kasap, S.O., **Optoelectronics & Photonics: Principles & Practices**, 2nd Edition, Pearson, 2012, ISBN-9780132151498

3204 Donald Neamen, **Microelectronics Circuit Analysis and Design**, 4th edition, 2009. McGraw-Hill. ISBN 9780073380643.

3214 Donald Neamen, **Semiconductor Physics and Devices,** 4th edition, McGraw-Hill. ISBN 9780073529585

3254 **(Applied Electrical Theory – ME students only)**
Allan R. Hambley, **Electrical Engineering Principles and Applications– Access Card Package**, 7th edition, PEARSON. 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.
STUDENTS SHOULD HAVE FROM TAKING ECE 2054

3274 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, F. & Henry, T. (2016). *Data abstraction and problem solving with C++: Walls and mirrors.* (7th Edition) London, United Kingdom: Pearson. pp. 864.ISBN 978-0134463971

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

Shaw, Z. (2014). *Learn Python the hard way: A very simple introduction to the terrifyingly beautiful world of computers and code* (3rd ed.) Boston, MA: Addison-Wesley. pp. 320. ISBN: 978-0321884916

3544 John Wakerly, (2017). *Digital Design Principles and Practices,* (5th edition) PEARSON. ISBN 978-0134460093.

3564 James F. Kurose and Keith W. Ross, Computer Networking: A Top-Down Approach. Pearson. 8th edition, 2021. ISBN: 978-0135928608.(Was ECE 4614) Electronic Book only. Paper copy available for rental only.

3574 David Thomas and Andrew Hunt. **The Pragmatic Programmer.** Addison-Wesley, 2ed. 2020. ISBN 978-0135957059.

3604 Ellingson, S.W. (2016). **Radio Systems Engineering**, Cambridge University Press, pp. 650. ISBN 978-1107068285

3614 Grami, Ali (2015). **Introduction to Digital Communications.** Academic Press (Elsevier), pp. 604. ISBN 978-0124076822.

3704 **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

3714 Nise, Norman S. (2020). **CONTROL SYSTEMS ENGINEERING**. 8th Edition, John Wiley and Sons. 800pp. ISBN: 978-1-119-72140-6

4114 Stutzman and Thiele, **Antenna Theory and Design**, 3rd edition, John Wiley. ISBN 978-0470576649.

4124 John S. Seybold, **Introduction to RF Propagation**, John Wiley, 1st edition, 2005. ISBN 978-0471655961.

4144 T.-C. Poon and J.-P. Liu, **Introduction to Modern Digital Holography**, Cambridge Univ. Press. 1st edition, 2014. ISBN 978-1107016705.

4174 Prölss, G. W., **Physics of the earth's space environment**,1st Ed. Berlin: Springer, 2004. Pp. xv, 513. ISBN 978-3540214267. (Cross-listed with AOE)

4254 **No textbook required. Co-located with ECE 5224**

4284 **No textbook required.** ECE Department, **ECE 4284 Lab Manual**

4354 Stanley H. Horowitz and Arun G. Phadke, **Power System Relaying**, 4th edition. John Wiley. ISBN 978-1118662007.

4364/5374G

No textbook required. Instructor provides a free online textbook.

***4424/CS4824**

No textbook required.

4504 John Hennessy and David Patterson, **Computer Architecture: A Quantitative Approach.** Elsevier, 6th edition. 2017. ISBN 978-0128119051. (Cross-listed with CS) Co-located with ECE/CS 5504. Taught by CS SP22.

4514 **No textbook required**.

4524 Stuart Rusell and Peter Norvig, **Artificial Intelligence: A Modern Approach,** 4th Edition, 2020. 1152 pp. Pearson. ISBN: 978-0134610993.

4534 **No textbook required**.

4550/5550G

Giorgio C. Buttazzo, **Hard Real-Time Computing Systems: Predictable Scheduling Algorithms and Applications**, 3rd edition, Springer. ISBN 9781461406754
Same room as 5550G

4560 Ed Skoudis with Tom Liston, **Counter Hack Reloaded**, 2nd edition, Prentice-Hall. ISBN 978-0131481046.

4564 No cost to students (Full-text 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 978-1430258544)

TJ O'Connor, Violent Python : A Cookbook for Hackers, Forensic Analysts, Penetration Testers and Security Engineers, Elsevier/Syngress, 2012, (ISBN 978-1-59749-964-4)

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

4644 Mung Chiang, **Networked Life: 20 Questions and Answers,** 1Edition, 2012. Cambridge University Press. ISBN: 978-1107024946

4704 **No textbook required.** Consult with the instructor.

4805 & 4806 (Senior Design Project)
Required Text:
Patrick Lencioni, **The 5 Dysfunctions of a Team**, 2010. John Wiley & Sons. ISBN: 978-0787960759.

4944 Required reference materials will be made available electronically.

4984 **Interdisciplinary Design 2. Queen, R. No textbook required**

4984 Levi, A. **Applied Quantum Mechanics,** 2006, Cambridge University Press. 2nd edition. ISBN 978-0521183994

5106 Jian-Ming Jin. **Theory and Computation of Electromagnetic Fields**, 2010, Wiley. 2nd edition, ISBN 978-1119108047

5205 Dieter K. Schroder, **Semiconductor Material and Device Characterization**, 2006, 3rd edition, John Wiley. ISBN 978-0471739067.

5210 Marc J. Madou, Fundamentals of Microfabrication and Nanotechnology. 3rd edition, CRC Press. 2011. ISBN: 978-0849331800

Recommended:
Stephen D. Senturia, ***Microsystem Design,*** 2nd edition, Springer. ISBN: 978-0792372462

5224 **No textbook required. Co-located with ECE 4254.**

5264 The instructor will provide a collection of relevant conference and journal papers and reference documents in this field.

Optional: Thomas H. Lee, **Planar Microwave Engineering: A Practical Guide to Theory, Measurement, and Circuits**, 2004, Cambridge University Press. ISBN 978-521835268.

5274 Lecture notes provided by the instructor via website, "Modeling and Control of Three-Phase PWM Converters."
A list of publications related to the subject.

5334 **No textbook required**.

5374G/4364 **No textbook required**

5424/5824 cross-listed with CS

Kevin Murphy, **Machine Learning: A Probabilistic Perspective**, MIT Press, 2012. ISBN 978-0262018029. **(Cross-listed with CS)**
This book is for sections taught by ECE. SP 2022.

Sections taught by CS will use:
Christopher M. Bishop. **Pattern Recognition and Machine Learning.** Springer. 2nd Edition. ISBN: 978-0387310732.

5434 Platzer A. (2018). **Logical Foundations of Cyber-Physical Systems**. Springer. ISBN: 978-3-319-63588-0

5444 Shanahan, M. (2015). **The Technological Singularity**. Cambridge, MA: MIT Press. Pp. xv, 272.
The book is available for free and online from the VT library.

5454 **No textbook required**. Handouts and publication readings provided by the instructor.

5480 Charles Pfleeger, et al. **Security in Computing**. 5th edition, Upper Saddle River, New Jersey: Prentice Hall, 2015, 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 978-1284123036 (on-line – MIT only)

5486 Selected journal papers, magazine articles, and conference papers to be provided online.(On-Line MIT only)

5494 Poole, D.L. & Mackworth, A.K. (2017). Artificial intelligence: Foundations of computational agents, 2nd Edition. ISBN: 978-1107195394 [Free version online: https://artint.info/index.html]

5504 John Hennessy and David Patterson, **Computer Architecture: A Quantitative Approach.** Elsevier, 6th edition. 2017. ISBN 978-0128119051.(Cross-listed with CS and Co-located with ECE/CS 4504). Taught by CS SP22.

5514 **No textbook required.**

5544 Aho, Lam, Sethi & Ullman, **Compilers: Principles, Techniques, and Tools.** 2nd Edition. Pearson. 2007. 1040pp. ISBN: 978-0321486813

5545 Weste and Harris, **CMOS VLSI Design, A Circuits and Systems Perspective**, 4th edition, 2004. Pearson. ISBN 9780321547743.

Recommended:
Joseph G. Tront, ***PSpice for Basic Microelectronics****, McGraw-Hill, 2008. ISBN 9780073529479.*

5550G/4550 Giorgio C. Buttazzo, **Hard Real-Time Computing Systems: Predictable Scheduling Algorithms and Applications**, 3rd edition, Springer. ISBN 9781461406754

5560/CS5560
No textbook required. CS teaches for SP 2022.

5566/CS5566 No textbook required

5586 William Stallings; Lawrie Brown**,** ***Computer Security: Principles and Practice*****,** Pearson, 4th edition. ISBN 9780134794105. **(On-Line – MIT Only)**

5590/CS5590 CS teaches
No textbook required

5606 H. Vincent Poor**, An Introduction to Signal Detection and Estimation,** 2nd edition, Springer. 1994. ISBN 9781441928375.

5620 John G. Proakis and Dimitris G. Manolakis, **Digital Signal Processing: Principles, Algorithms, and Applications**, 4th edition, 2006, Prentice-Hall. Student edition of Matlab. ISBN 9780131873742

5634 Thomas M. Cover and Joy A. Thomas, **Elements of Information Theory,** 2nd Edition 2006, Wiley. ISBN 978-0471241959

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

5654 John Proakis, **Digital Communications**, 5th edition, 2008. McGraw-Hill. ISBN 9780071263788.

5660 No textbook required.

5664 Nishith Tripathi and Jeffrey H. Reed, **Cellular Communications: A Comprehensive and Practical Guide**, 2014, Wiley-IEEE Press. ISBN 9780470472071.

5714 **(Zoom course – originates Northern VA)** Class notes and papers will be provided.
No textbook required.

5764/AOE5764/ME5564

No textbook required. All course materials will be provided by the instructor through course notes.

5805&5806

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

5944 **No textbook required.**

5984 **(Special Study-Applications of Machine Learning. Creed Jones) SP22.**

Kelleher, J. Mac Namee, B., & D'Arcy, A. (2015). *Fundamentals of machine learning for predictive data analytics: algorithms, worked examples, and Case Studies* (1st ed.). MIT Press. Pp. xxi, 624. ISBN-13 : 978-0262029445

5984 **(Special Study-HVDC, FACTS, and Renewables. Ali Merihizi-Sani) SP22.**

No textbook required

5984 **(Special Study-Intro to Quantum Lab-Dr. Wayne Scales). SP22.**

No textbook required

5984 **(Special Study-Advanced Analog IC Design, Cindy Yi) SP22.**

Razavi, Behzad. **Design of Analog CMOS Integrated Circuits**, McGraw Hill, ISBN: 0071188398, 2001. Pp. 801.

5984 **(Special Study-Trustworthy ML. Ruoxi Jia)SP22**

No textbook required. Notes and other study materials will be supplied by the instructor.

5984 **(Special Study-Deep Reinforcement Learning- Dr. Jason Xuan). SP22.**

No textbook required

6116 Stutzman, Warren L. **Antenna Theory and Design.** WILEY, 3rd Edition, 2012. ISBN 978-0470576649

6154 **No textbook required**

6174/AOE6174. Taught by AOE.

Jardin, S., **Computational Methods in Plasma Physics**. Chapman & Hall/CRC Computational Science 1st, 2010. ISBN 9781439810217

6204 AT: Inverter Circ&Ctrl Implementation. Jason Lai. **SP22.**

No textbook required.

6334 **No textbook required.**

6524/CS6524

No textbook required.

6744 **No textbook required.**
(CROSS-LISTED with AOE6744/ME6544)

6774 *State-of-the-art written notes will be provided by the instructor*. – ME teaches.
Supplemental Material – suggested textbook – M. Krstic, I. Kanellakopoulos, P. Kokotovic, **Nonlinear and Adaptive Control Design,** Wiley, 1995.
(CROSS-LISTED AOE6774/ME6574)