

-Spring 2021 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.

*1574 Tony Gaddis, - **Starting Out with C++: From Control Structures through Objects, Brief Version**, 9th Edition, Pearson, 2019. ISBN:9780135226759.
My programming Lab is not required.

*2024 Lecture notes provided by the instructor. **No textbook required.**

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, Prentice-Hall. 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 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:
<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.

*3074 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
- *3154 **No textbook required.** The supervising instructor will create and furnish user-guides for the students prior to each laboratory exercise to ensure that equipment can be operated safely and effectively.
- *3174 **No textbook required.**
- *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 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.
- *3524 Negus C. (2015). *Linux Bible* (10th edition). Hoboken, NJ: John Wiley & Sons. pp. 912. ISBN 978-1119578888.
- Shaw, Z. (2015). *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 9780134460093.
- *3574 David Thomas and Andrew Hunt. **The Pragmatic Programmer**. Addison-Wesley, 2020. ISBN 9780135957059.
- *3604 Ellingson, S.W., **Radio Systems Engineering**, Cambridge University Press, 2016, 680. ISBN 9781107068285
- *3614 Ali Grami, **Introduction to Digital Communications**, Academic Press(Elsevier), 2016. ISBN 978-0124076822.
- *3704 Oppenheim, A. V., Willsky, A. S., and Nawab, S. H. **SIGNALS AND SYSTEMS**. ii, Pearson, 1996, 1000. ISBN: 978-0138147570 or ISBN-10:0138147574
- *3714 Nise, Norman S. **CONTROL SYSTEMS ENGINEERING**. 8th Edition, John Wiley and Sons, 2020, 800pp. ISBN: 978-1-119-72140-6
- *4114 Stutzman and Thiele, **Antenna Theory and Design**, 3rd edition, John Wiley. ISBN 9780470576649.
- *4124 John S. Seybold, **Introduction to RF Propagation**, John Wiley, 1st edition, 2005. ISBN 9780471655961.
- *4144 T.-C. Poon and J.-P. Liu, **Introduction to Modern Digital Holography**, Cambridge Univ. Press. 1st edition, 2014. ISBN 9781107016705.
- *4254 **No textbook required.**

- *4284 ECE Department, ECE 4284 Lab Manual
- *4354 Stanley H. Horowitz and Arun G. Phadke, Power System Relaying, 4th edition. John Wiley. ISBN 9781118662007.
- *4364/5374G
No textbook required. Instructor provides free online textbook.
- *4424/CS4824
 Shai Shalev-Shwartz and Shai Ben-David, *Understanding Machine Learning: A Probabilistic Perspective*, 1st Ed. Cambridge University Press, 2014.
Free Digital copy for students.
<https://www.cs.huji.ac.il/~shais/UnderstandingMachineLearning/copy.html>
 ISBN 978-1107057135. Book used by CS instructor for SP21.
(Cross-listed with CS)
CS teaches during SP2021. Dr. Lifu Huang.
- *4504 John Hennessy and David Patterson, Computer Architecture: A Quantitative Approach. Morgan Kaufmann, 6th edition. 2017. ISBN 978-0128119051. **(Cross-listed with CS)**
- *4514 **No textbook required.**
- *4524 D. L. Poole and A. K. Mackworth, *Artificial Intelligence: Foundations of Computational Agents*, 2nd Edition, Cambridge University Press, 2017. ISBN: 978-0521519007
- *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 (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

- *4580 R. C. Gonzalez & R. E. Woods, **Digital Image Processing**, 4th edition, PEARSON. ISBN 9780133356724. Jason Xuan confirmed
- *4614 James F. Kurose and Keith W. Ross, **Computer Networking: A Top-Down Approach**, 7th edition, 2016. Pearson. ISBN: 9780133594140.
- *4644 Mung Chiang, **Networked Life: 20 Questions and Answers**, 1Edition, 2012. Cambridge University Press. ISBN: 9781107024946
- *4704 **No textbook required.** Consult with instructor.
- *4805 & 4806 (Senior Design Project)
Required Text:
Patrick Lencioni, **The 5 Dysfunctions of a Team**, 2010. John Wiley & Sons. ISBN: 9780787960759.
- *4944 Required reference materials will be made available electronically.
- *4984 **Interdisciplinary Design 2. Queen, R. No textbook required**
- *4984 & 5984 (Electronic Packaging-Special Study-Christina DiMarino)
No textbook required. Notes and other study materials will be supplied by the instructor.
- *4984 (Applied Quantum Mechanics–Special study–V. Kovanis)
Anthony Levi. **Applied Quantum Mechanics**, 2006. Cambridge University Press. ISBN: 9780521860963.
Recommended:
David A.B. Miller. **Quantum Mechanics for Scientists and Engineers**, 2008. Cambridge University Press. ISBN: 9780521897839
- *5106 Jian-Ming Jin. **Theory and Computation of Electromagnetic Fields**, 2010, Wiley. 2nd edition, ISBN 9781119108047

- *5205 Dieter K. Schroder, Semiconductor Material and Device Characterization, 2006, 3rd edition, John Wiley. ISBN 9780471739067.
- *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 978521835268.
- *5274 Lecture notes provided by instructor via website, “Modeling and Control of Three-Phase PWM Converters.”
A list of publications related to the subject.
- *5324 Stoll, Least-Cost Electric Utility Planning, John Wiley & Sons, Inc, 1989. ISBN 9780471636144.
- *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 9780262018029. **(Cross-listed with CS)**
This book is for sections taught by ECE. SP 2021.
- *5434 Platzner A. (2018). Logical Foundations of Cyber-Physical Systems. Springer, 2018. 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 9781284123036 (on-line – MIT only)
- *5486 Selected journal papers, magazine articles, and conference papers to be provided online.(On-Line MIT only)
- *5514 **No textbook required.**

- *5534 Laung-Terng Wang, Yao-Wen Chang, and Kwang-Ting Cheng, Electronic Design Automation: Synthesis, Verification and Test, Morgan Kaufman, 2009. ISBN 9780123743640.
- *5550G/4550 Giorgio C. Buttazzo, Hard Real-Time Computing Systems: Predictable Scheduling Algorithms and Applications, 3rd edition, Springer. ISBN 9781461406754
- *5560/CS5560 William Stallings, Cryptography and Network Security - Principles and Practices, 7th edition, Pearson. ISBN-ISBN 9780134444284.
CS teaches these sections for SP 2021.
- *5564 **No textbook required.**
- *5566/CS5566 **No textbook required.**
- *5584 William Stallings, Network Security Essentials: Applications and Standards, 6th edition, PEARSON. 2017. 9780134527338.
- *5586 William Stallings; Lawrie Brown, Computer Security: Principles and Practice, Pearson, 4th edition. ISBN 9780134794105. (On-Line – MIT Only)
- *5590/CS5590 CS teaches during SP21
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
- *5654 John Proakis, Digital Communications, 5th edition, 2008. McGraw-Hill. ISBN 9780071263788.
- *5664 Nishith Tripathi and Jeffrey H. Reed, Cellular Communications: A Comprehensive and Practical Guide, 2014, Wiley-IEEE Press. ISBN 9780470472071.
- *5704 **Cross-listed with ME.**
Kurdila, A. J., Ben-Tzvi, P., *Dynamics and Control of Robotics Systems*. Wiley; 1 edition (December 16, 2019)
- *5714 (Zoom course – originates Northern VA) Class notes and papers will be provided.
No textbook required.
- *5734 **CROSS-LISTED with AOE 5734 & ME 5584**

Boyd, S. & Vandenberghe, L. (2004). *Convex Optimization*. New York: Cambridge University Press. Pp. xiv, 730. ISBN: 978-0521833783 (Hardcover)

***5764/AOE5764/ME5564**

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

***5944 No textbook required.**

***5984 (Special Study-Innv Pthwys AI & Mach Lrng-VT-MIT-K. Giles)**

Poole, D.L. & Mackworth, A.K. (2017). **Innovation Pathways AI&ML Foundations of Computational Agents**, 2nd Edition. [Free version online: <https://artint.info/index.html>]

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

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-Compiler Optimizations. Binoy Ravindran)**

Aho, A. V., Lam, M. S., Sethi, R., and Ullman, J. D. (2006). *Compilers: Principles, Techniques, and Tools*. (2nd ed.). Boston, MA: Addison Wesley. Pp. 1040. ISBN: 9780321486813

***5984 & 4984 (Electronic Packaging-Special Study-Christina DiMarino)**

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

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

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

***5984 (Special Study-Optimization Theory for ML. Ming Jin)**

No textbook required No text is required because all course materials will be presented in class or will be available online as notes. We will draw materials from recent research and survey papers that are accessible through library, as well as excerpts of relevant background material from online textbooks.

***5984 (Special Study-Power Distribution System Analysis. Vassilis Kekatos)**

W.H. Kersting, *Distribution System Modeling and Analysis*, 4th Edition, CRC Press, 2017. ISBN 978-1498772136. **Free e-Book at VT Libraries.**

Recommended:

T. Gonen, *Electric Power Distribution Engineering*, 3rd Edition, CRC Press, 2014. ISBN 978-1482207002

***6115** 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

***6504 Advanced Topic-Operating Systems and Virtualization-Dr. Ruslan Nikolaev.**

No textbook required.

***6504 Advanced Topic- Spectrum Sharing, 5G and IoT. Dr. T. Hou. No textbook required.**

6524/CS6524

No textbook required.

6744 No textbook required.

(CROSS-LISTED 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)