

UNIVERSITY OF CAMBRIDGE COMPUTER LABORATORY

Computer Science Tripos Parts IA, IB, and II

Summary List of Books Recommended by Lecturers

September 2020

This list is prepared once a year for the benefit of College Librarians and those purchasing course books. As such it aims to list the most recently available editions of current course books. However, in many cases, older editions are equally useful and this list should be used in conjunction with those in the syllabus booklets, which give more information on the suitability of titles for each course.

Key to the present list:

IA On Part IA reading lists
IB On Part IB reading lists
II On Part II reading lists

*** Most recommended
** Recommended
* Further reading

The syllabus booklets can be found via links from
<http://www.cl.cam.ac.uk/teaching/>

The Computer Laboratory Library aims to keep at least one copy of each of the course texts in “The Booklocker” (see <http://www.cl.cam.ac.uk/library/>).

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Agrawal, D. & Zheng, Q. (2006). *Introduction to wireless and mobile systems*. Thomson. [**, II]

Aho, A.V., Sethi, R. & Ullman, J.D. (2007). *Compilers: principles, techniques and tools*. Addison-Wesley (2nd ed.). ISBN 0321491696 [**, IB, II]

Akenine-Möller, T. (2018). *Real-time rendering*. CRC Press (4th ed.). ISBN 9781138627000 [**, IB]

Anderson, R. (2020). *Security engineering*. Wiley (3rd ed.). ISBN 9781119642787
Available at: <http://www.cl.cam.ac.uk/users/rja14/book.html>

Anderson, T. & Dahlin, M. (2014). *Operating systems: principles and practice*. Recursive Books (2nd ed.). ISBN 9780985673529 [**, IA]

Appel, A. (1997). *Modern compiler implementation in Java/C/ML* (3 editions). Cambridge University Press. [***, IB, II]

Bacon, J. (1997). *Concurrent Systems*. Addison-Wesley. [**, IB]

Bacon, J. & Harris, T. (2003). *Operating systems*. Addison-Wesley (3rd ed.). ISBN 0321117891 [***, IA, IB]

- Ben-Ari, M. (2012). *Mathematical logic for computer science*. Springer (3rd ed.). ISBN 9781447141280 [**, IB]
- Bertsekas, D.P. & Tsitsiklis, J.N. (2008). *Introduction to probability*. Athena Scientific. [* , IA]
- Biggs, N.L. (2002). *Discrete mathematics*. Oxford University Press (2nd ed.). ISBN 9780198507178 [**, IA]
- Bishop, C.M. (2006). *Pattern recognition and machine learning*. Springer. ISBN 0387310738. Available at: <https://www.microsoft.com/en-us/research/uploads/prod/2006/01/Bishop-Pattern-Recognition-and-Machine-Learning-2006.pdf>
- Bloch, J. & Gafter, N. (2005). *Java puzzlers*. Addison-Wesley. [**, IA]
- Boreskov, A. & Shikin, E. (2014). *Computer graphics: from pixels to programmable graphics hardware*. CRC Press (2nd ed.). ISBN 9781439867303 [**, II]
- Bratko, I. (2012, 2001). *PROLOG programming for artificial intelligence*. Addison-Wesley (4th, 3rd eds.). [***, IB]
- Brachman, R.J. & Levesque, H.J. (2004). *Knowledge Representation and Reasoning*. Morgan Kaufmann. ISBN 9781558609327 [* , IB]
- Carroll, J.M. (2003). *HCI Models, theories and frameworks: toward a multi-disciplinary science*. Morgan Kaufmann. ISBN 1558608087 [* , IB]
- Cawsey, A. (1998). *The essence of artificial intelligence*. Prentice Hall. [* , IB]
- Clark, A., Fox, C., & Lappin, S. (2010). *The handbook of computational linguistics and natural language processing*. Wiley-Blackwell. ISBN 9781405155816 [* , III]
- Comer, D. & Stevens, D. (2014). *Internetworking with TCP-IP, vol. 1 and 2*. Prentice Hall (6th ed.). [**, IB]
- Compeau, P. & Pevzner, P.A. (2015). *Bioinformatics algorithms: an active learning approach*. Active Learning Publishers. [**, II]
- Cormen, T.H., et. al. (2009). *Introduction to Algorithms*. MIT Press (3rd ed.). ISBN 9780262533058 [***, IA, IB]
- Coulouris, G.F., Dollimore, J.B. & Kindberg, T. (2011). *Distributed systems, concepts and design*. Addison-Wesley (5th ed.). ISBN 9780273760597 [**, IB]
- Cover, T.M. & Thomas, J.A. (2006). *Elements of information theory*. New York: Wiley (2nd ed.). ISBN 9780471241959 [***, II]
- Crowe, J. & Hayes-Gill, B. (1998). *Introduction to digital electronics*. Butterworth-Heinemann. [* , IA]
- Cutland, N.J. (1980). *Computability: an introduction to recursive function theory*. Cambridge University Press. [**, IB]
- Davenport, H. (2008). *The higher arithmetic: an introduction to the theory of numbers*. Cambridge University Press. ISBN 0521722365 [**, IA]
- Davis, M.D., Sigal, R. & Weyuker, E.J. (1994). *Computability, complexity and languages*. Academic Press (2nd ed.). [**, IB]
- Dechter, R. (2003). *Constraint processing*. Morgan Kaufmann. [* , IB]

- Deitel, H.M. & Deitel, P.J. (2017). *Java: How to Program*. Prentice Hall (11th ed.). ISBN 9781292223858 [***, IA]
- Dekking, F.M., et. al. (2005). *A Modern introduction to probability and statistics*. Springer. ISBN 1852338962 [**, IA, IB]
- Dowd, M., McDonald, J. & Schuh, J. (2007). *The art of software security assessment*. Addison-Wesley. ISBN 9780321444424 [**, IB]
- Durbin, R., et. al. (1998). *Biological sequence analysis: probabilistic models of proteins and nucleic acids*. Cambridge University Press. ISBN 0521629713. [***, II]
- Easley, D. & Kleinberg, J. (2010). *Networks, crowds and markets: reasoning about a highly connected world*. Cambridge University Press. ISBN 9780521195331 [**, IA]
- Eckel, B. (2000). *Thinking in C++, Vol. 1: Introduction to Standard C++*. Prentice Hall (2nd ed.). [***, IB]
- Felsenstein, J. (2003). *Inferring phylogenies*. Sinauer Associates. [**, II]
- Flanagan, D. (2004). *Java examples in a nutshell : a tutorial companion to Java in a nutshell*. O'Reilly (3rd ed.). ISBN 9780596006204 [**, IA]
- Flanagan, D. (2014). *Java in a nutshell : a desktop quick reference*. O'Reilly (6th ed.). ISBN 9781449370824 [**, IA]
- Foley, J.D., et. al. (2009). *Computer graphics: principles and practice*. Addison-Wesley (3rd ed.). ISBN 9780321399526 [***, IB]
- Forsyth, D.A. & Ponce, J. (2012). *Computer vision : a modern approach*. Prentice Hall (2nd ed.). ISBN 9780273764144 [**, II]
- Galbraith, J.K. (1991). *A history of economics*. Penguin. [*, IB]
- Gamma, E., et. al. (1995). *Design patterns: elements of reusable object-oriented software*. Addison-Wesley. [**, IA]
- Ghallab, M., Nau, D. & Traverso, P. (2004). *Automated planning: theory and practice*. Morgan Kaufmann. [*, IB, II]
- Gibson, J.R. (1992). *Electronic logic circuits*. Butterworth-Heinemann. [*, IA]
- Girard, J-Y. (tr. Taylor, P. & Lafont, Y.) (1989). *Proofs and types*. Cambridge University Press. [**, II]
- Goetz, B. (2006). *Java concurrency in practice*. Addison-Wesley. ISBN 9780321349606 [***, IB]
- Goldreich, O. (2010). *P, NP, and NP-Completeness: the basics of computational complexity*. Cambridge University Press. ISBN 9780521122542 [**, IB]
- Gollmann, D. (2010). *Computer security*. Wiley (3rd ed.). [**, IB, II]
- Gosling, J., et. al. (2014). *The Java language specification*. Addison-Wesley (Java SE 8 ed.). <http://docs.oracle.com/javase/specs/jls/se8/html/> [**, IB]
- Grimmett, G. & Welsh, D. (2014). *Probability: an introduction*. Oxford University Press (2nd ed.). ISBN 9780198709978 [***, IA]
- Gunter, C. (1992). *Semantics of programming languages: structures and techniques*. MIT Press. [**, II]
- Hammack, R. (2013). *Book of proof*. Privately published (2nd ed.). ISBN 9780989472104. Available at <http://www.people.vcu.edu/~rhammack/>

BookOfProof/index.html [***, IA]

Harchol-Balter, M. (2013). *Performance modelling and design of computer systems: queueing theory in action*. Cambridge University Press. ISBN 9781107027503 [**, IB]

Harris, D.M. & Harris, S.L. (2013). *Digital design and computer architecture*. Morgan Kaufmann (2nd ed.). ISBN 9780123944245 [***, IA, IB]

Hayes, J.P. (1993). *Introduction to digital logic design*. Addison-Wesley. [**, IA]

Hennessy, J. & Patterson, D. (2019). *Computer architecture: a quantitative approach*. Elsevier (6th ed.). ISBN 9780128119051. (Older versions of the book are also still generally relevant.) [**, IB, II]

Hennessy, M. (1990). *The semantics of programming languages*. Wiley.

Out of print, but available on the web at <http://www.cs.tcd.ie/matthew.hennessy/splexternal2015/resources/sembookWiley.pdf> [**, IB]

Hindley, J.R. & Seldin, J.P. (2008). *Lambda-calculus and combinators, an introduction*. Cambridge University Press (2nd ed.). [***, IB]

Hirvensalo, M. (2004). *Quantum computing*. Springer (2nd ed.). ISBN 3540407049 [**, II]

Hopcroft, J.E., Motwani, R. & Ullman, J.D. (2007). *Introduction to automata theory, languages, and computation*. Addison-Wesley (3rd ed.). ISBN 0321455363 [***, IA, IB]

Horowitz, P. & Hill, W. (2015). *The art of electronics*. Cambridge University Press (3rd ed.). ISBN 9780521809269. [*, IA]

Houston, K. (2009). *How to think like a mathematician: a companion to undergraduate mathematics*. Cambridge University Press. ISBN 9780521719780. [IA, ***]

Hughes, J.F., et. al. (2013). *Computer graphics: principles and practice*. Addison-Wesley (3rd ed.). ISBN 9780321399526 [**, IB]

Huth, M. & Ryan M. (2004). *Logic in computer science: modelling and reasoning about systems*. Cambridge University Press (2nd ed.). ISBN 052154310X. [**, IB, II]

Jain, A.R. (1991). *The art of computer systems performance analysis*. Wiley. [**, II]

Jones, N.C. & Pevzner, P.A. (2004). *An introduction to bioinformatics algorithms*. MIT Press. [***, II]

Jurafsky, D. & Martin, J. (2008). *Speech and language processing*. Prentice Hall. [***, II]

Karl, H. & Willig, A. (2005). *Protocols and architectures for wireless sensor networks*. Wiley. [***, II]

Katz, J. & Lindell, Y. (2015). *Introduction to modern cryptography*. CRC Press (2nd ed.). ISBN 9781466570269 [***, II]

Katz, R.H. (2004). *Contemporary logic design*. Benjamin/Cummings. The 1994 edition is more than sufficient. [**, IA]

Kaye, P., Laflamme R. & Mosca, M. (2007). *An introduction to quantum computing*. Oxford University Press. ISBN 9780198570493 [**, II]

Kernighan, B.W. & Ritchie, D.M. (1988). *The C programming language*. Prentice Hall (2nd ed.). [**, IB]

- Keshav, S. (1997). *An engineering approach to computer networking*. Addison-Wesley (1st ed.). ISBN 0201634422 [* , II]
- Keshav, S. (2011). *Mathematical Foundations of Computer Networking*. Addison Wesley. ISBN 9780321792105 [*** , II]
- Kim, W. & Mauborgne, R. (2015). *Blue Ocean Strategy*. Harvard Business Review Press. ISBN 9781625274496 [* , II]
- Kleinberg, J. & Tardos, É. (2006). *Algorithm design*. Addison-Wesley. ISBN 9780321372918. [** , IA, IB]
- Kleinrock, L. (1975). *Queueing systems, vol. 1. Theory*. Wiley. [** , II]
- Kleppmann, M. (2017). *Designing data-intensive applications*. O'Reilly. ISBN 9781449373320. [** , IB]
- Knuth, D.E. (2011). *The art of computer programming*. Addison-Wesley (3rd ed.). ISBN 978-0321751041. [** , IA]
- Kozen, D.C. (1997). *Automata and computability*. Springer-Verlag. [*** , IA]
- Kurose, J.F. & Ross, K.W. (2013). *Computer networking: a top-down approach*. Pearson (6th ed.). ISBN 9780273768968 [*** , IB]
- Lamport, L. (1994). *LaTeX – a documentation preparation system user’s guide and reference manual*. Addison-Wesley (2nd ed.). [*** , IB]
- Lang, J. (2001). *The high-tech entrepreneur’s handbook: how to start and run a high-tech company*. FT.COM/Prentice Hall. [** , II]
- Leffler, S. (1989). *The design and implementation of the 4.3BSD Unix operating system*. Addison-Wesley. [** , IA]
- Lehman, E., Leighton, F.T., Meyer, A.R. (2012). *Mathematics for computer science*. Available at <http://courses.csail.mit.edu/6.042/spring12/mcs.pdf>. [*** , IA]
- Lemahieu, W., Broucke S. van den & Baesens, B. *Principles of database management*. Cambridge University Press. ISBN 9781107186125 [*** , IB]
- Levitt, S.D. & Dubner, S.J. (2005). *Freakonomics*. Morrow. [* , IB]
- Lippman, S.B. (1996). *Inside the C++ object model*. Addison-Wesley. [** , IB]
- Lyons, R.G. (2010). *Understanding digital signal processing*. Prentice Hall (3rd ed.). ISBN 9780132119375 [*** , II]
- Manning, C.D. & Schütze, H. (1999). *Foundations of statistical natural language processing*. MIT Press. ISBN 9780262133609 [** , III]
- Marschner, S. & Shirley, P. (2016). *Fundamentals of computer graphics*. Peters (4th ed.). ISBN 9781482229394 [*** , II]
- Maurya, A. (2012). *Running lean: Iterate from plan A to a plan that works*. O'Reilly (2nd ed.). ISBN 9781449305178 [* , II]
- McGeoch, C.C. (2014). *Adiabatic quantum computation and quantum annealing*. Morgan and Claypool. ISBN 9781627055925 [* , II]
- McKusick, M.K., Neville-Neil, G.V., and Watson, R.N.M. (2014). *The Design and implementation of the FreeBSD operating system*. (2nd ed.). Pearson Education. ISBN 9780321968975 [** , IA]
- Mead, C. & Conway, L. (1980). *Introduction to VLSI systems*. Addison-Wesley. [* , IA]

- Mermin, N.D. (2007). *Quantum computer science*. Cambridge University Press. [**, II]
- Mesbahi, M. & Egerstedt, M. (2010) *Graph theoretic methods in multiagent networks*. Princeton University Press. ISBN 9780691140612 [* , III]
- Mitchell, J.C. (2003). *Concepts in programming languages*. Cambridge University Press. [***, IB]
- Mitchell, T.M. (1997). *Machine Learning*. McGraw-Hill. ISBN 0071154671 [**, II]
- Mittelbach, F., et al. (2004). *The LATEX companion*. Addison-Wesley (2nd ed.). ISBN 0201362996. [* , II]
- Mitzenmacher, M. & Upfal, E. (2017). *Probability and computing: randomized algorithms and probabilistic analysis*. Cambridge University Press (2nd ed.). ISBN 9781107154889. [**, IB, II]
- Mogensen, T. Æ. (2011). *Introduction to compiler design*. Springer. ISBN 9780857298287. Available at <http://www.diku.dk/~torbenm/Basics>. [**, IB]
- Mondada, F. & Mordechai B. (2018) *Elements of Robotics*. Springer. ISBN 9783319625324 [**, III]
- Muchnick, S. (1997). *Advanced compiler design and implementation*. Morgan Kaufmann. [**, II]
- Murphy, K.P. (2012). *Machine Learning: A Probabilistic Perspective*. MIT Press. ISBN 9780262018029 [**, II]
- Nielsen, M.A. & Chuang, I.L. (2010). *Quantum computation and quantum information*. Cambridge University Press (2nd ed.). [***, II]
- Nielson, F., Nielson, H.R. & Hankin, C.L. (1999). *Principles of program analysis*. Springer. [***, II]
- O’Keefe, R. (1990). *The craft of Prolog*. MIT Press. [* , IB]
- Odersky, M. (2008). *Scala by example*. Programming Methods Laboratory, EPFL. [**, IB]
- Okasaki, C. (1998). *Purely functional data structures*. Cambridge University Press. [**, IA]
- Oppenheim, A.V. & Schaffer, R.W. (2007). *Discrete-time digital signal processing*. Prentice Hall (3rd ed.). [**, II]
- Oppenheim, A.V. & Willsky, A.S. (1997). *Signals and systems*. Prentice Hall. [**, IB]
- Osterwalder, A. & Pigneur, Y. (2010). *Business model generation: a handbook for visionaires, game changers, and challengers*. Wiley. ISBN 9780470876411 [* , II]
- Paar, Ch. & Pelzl, J. (2010). *Understanding cryptography*. Springer. [***, IB]
- Papadimitriou, Ch.H. (1994). *Computational complexity*. Addison-Wesley. [***, IB]
- Patterson, D. & Hennessy, J. (2017). *Computer organisation and design*. Morgan Kaufmann (RISC-V ed.). ISBN 9780128122761 [***, IA, IB]
- Peterson, L.L. & Davie, B.S. (2011). *Computer networks: a systems approach*. Morgan Kaufmann (5th ed.). ISBN 9780123850591 [**, IB]
- Pierce, B.C. (2002). *Types and programming languages*. MIT Press. ISBN 0262162091 [***, IB, II]

- Pierce, B.C. (2005). *Advanced topics in types and programming languages*. MIT Press. ISBN 0262162288 [**, II]
- Pinker, S. (2011). *The Better Angels of our Nature*. Penguin. ISBN 9780141034645 [*, IB]
- Poole, D. L. & Mackworth, A. K. (2017). *Artificial intelligence: foundations of computational agents*. Cambridge University Press (2nd ed.). ISBN 9781107195394 [**, IB]
- Poundstone, W. (1992). *Prisoner's dilemma*. Anchor Books. [*, IB]
- Pratt, T.W. & Zelkowitz, M.V. (2001). *Programming languages: design and implementation*. Prentice Hall (4th ed.). [**, IB]
- Preece, J., Rogers, Y. & Sharp, H. (2015). *Interaction design*. Wiley (4th ed.). ISBN 9781119020752 [*, IA]
- Reinhard, E., et. al. (2010). *High dynamic range imaging*. Morgan Kaufmann (2nd ed.). ISBN 9780123749147 [**, II]
- Robbins, A. (2005). *Unix in a nutshell*. O'Reilly (4th ed.). [**, IB]
- Ross, S.M. (2002). *Probability models for computer science*. Academic Press. [***, IB, II]
- Ross, S.M. (2014). *A First course in probability*. Pearson (9th ed.). ISBN 9781262024929 [***, IA]
- Ruslan M. (2003) *The Oxford Handbook of Computational Linguistics*. Oxford University Press. ISBN 0198238827 [*, III]
- Russell, S. & Norvig, P. (2010). *Artificial intelligence: a modern approach*. Prentice Hall (3rd ed.). ISBN 9780132071482 [***, IB, II]
- Schiller, J. (2003). *Mobile communications*. Pearson (2nd ed.). [***, II]
- Schwartz, R.L., Foy, B.D. & Phoenix, T. (2011). *Learning Perl*. O'Reilly (6th ed.). [**, IB]
- Scott, M.L. (2016). *Programming language pragmatics*. Morgan Kaufmann (4th ed.). ISBN 9780124104099 [***, IB]
- Sedgewick, R. (2004). *Algorithms in Java* vol. 2 (note that C and C++ editions are also available and are equally good). Addison-Wesley. ISBN 0-201-36121-3. [**, IB]
- Sedgewick, R. & Wayne, K. (2011). *Algorithms*. Addison-Wesley (4th ed.). ISBN 9780321573513. [**, IA]
- Shapiro, C. & Varian, H. (1998). *Information rules*. Harvard Business School Press. [***, IB, II]
- Shapiro, L. & Stockman, G. (2001). *Computer vision*. Prentice Hall. [***, II]
- Shreiner, D., et. al. (2016). *OpenGL programming guide*. Addison-Wesley (9th ed.). ISBN 9780134495491 [**, IA]
- Siciliano, B. & Khatib, O. (2016) *Springer handbook of robotics*. Springer (2nd ed.). ISBN 9783319325507 [*, III]
- Siegwart, R., Nourbakhsh, I.R. & Scaramuzza, D. (2004) *Autonomous mobile robots*. MIT Press (2nd ed.). ISBN 9780262015356 [**, III]

- Silberschatz, A., Peterson, J.L. & Galvin, P.C. (2014). *Operating systems concepts*. Wiley (9th ed.). ISBN 9781118093757 [**, IA]
- Standage, T. (1999). *The Victorian Internet*. Phoenix Press. [* , II]
- Stein, J. (2000). *Digital signal processing – a computer science perspective*. Wiley. [**, II]
- Sterling, L. & Shapiro, E. (1994). *The art of Prolog*. MIT Press (2nd ed.). [**, IB]
- Stevens, W.R. & Fall, K.R. (2012). *TCP/IP illustrated, vol. 1: the protocols*. Addison-Wesley (2nd ed.). ISBN 9780321336316 [**, II]
- Stevens, W.R., Fenner, B. & Rudoff, A.M. (2003). *UNIX network programming, Vol.I: The sockets networking API*. Prentice Hall (3rd ed.). [**, IB]
- Stroustrup, B. (1994). *The design and evolution of C++*. Addison-Wesley. [**, IB]
- Stroustrup, B. (2014). *Programming — principles and practice using C++*. Addison-Wesley (2nd ed.). ISBN 9780321992789 [**, IB]
- Sudkamp, T.A. (2005). *Languages and machines*. Addison-Wesley (3rd ed.). [**, IB]
- Tanenbaum, A.S. & van Steen, M. (2002). *Distributed systems*. Prentice Hall. [**, IB]
- Tennent, R. (1991). *Semantics of programming languages*. Prentice Hall. [**, II]
- Thaler, R.H. (2016). *Misbehaving*. Penguin. ISBN 9780241951224 [* , IB]
- Thrun, S., Burgard, W. & Fox, D. (2005). *Probabilistic robotics*. MIT Press. ISBN 0262201623 [* , III]
- Varian, H. (1999). *Intermediate microeconomics – a modern approach*. Norton (9th ed.). ISBN 9780393920772 [**, IB]
- Velleman, D.J. (1994). *How to prove it (a structured approach)*. Cambridge University Press. [*** , IA]
- Watt, A. (2000). *3D Computer graphics*. Addison-Wesley (3rd ed.). ISBN 0201398559 [**, II]
- Weste, N.H.E. & Harris, D. (2011). *Integrated circuit design*. Addison-Wesley (4th ed.). ISBN 9780321696946 [* , IA]
- Whittington, J. (2013). *OCaml from the very beginning*. Coherent Press. ISBN 9780957671102 [*** , IA]
- Wilhelm, R. (1995). *Compiler design*. Addison-Wesley. [**, II]
- Winskel, G. (1993). *The formal semantics of programming languages*. MIT Press. [**, IB, II]