

MCS: Level 1 Study Plan

Sunday, March 29, 2026 8:36 PM

MCS Level 1 Study Plan						Progress: Principal Resource (%)	Progress: Supporting Resource (%)
systems science	systems thinking	design patterns	Jay W. Forrester Principles of Systems.: text and workbook media: digital format: pdf location: library location: web https://systemdynamics.org/product/principles-of-systems-1968/				
		complexity	Allen B. Downey Think Complexity: complexity science and computational modeling				
	signals	Aydin Akin, Luis F. Chaparro Signals and Systems Using MATLAB, 4 ed.	Maxwell Vector MATLAB fundamentals for Signals and Systems note: the author's surname is quite apropos.				
mathematics	review	Peter Collier A Most Incomprehensible Thing: notes towards a very gentle introduction to the mathematics of relativity, 2nd printing Introduction ch 01: Foundation Mathematics					
	analysis	Lara Alcock How to Think About Analysis					
		Jay Cummings Proofs: a long-form mathematics textbook					
		Jay Cummings Real Analysis: a long-form mathematics textbook, 2 ed					
	linear algebra	theory	intermediate	Marc Peter Deisenroth Mathematics for Machine Learning: Part 1 Mathematical Foundations ch 01: Linear Algebra	Alexandr Draganov Linear Algebra: an easy way to learn key concepts		
				Grant Sanderson Essence of Linear Algebra media: digital format: video location: web url: Essence of linear algebra preview publisher: https://www.3blue1brown.com/	Gilbert Strang Introduction to Linear Algebra, 4 ed. media: digital location: library note: see companion lectures at; location: web url: https://ocw.mit.edu/courses/18-06-linear-algebra-spring-2010/video_galleries/video-lectures/ note: he's been teaching this a long time so he gives out some very informative approaches and examples		
		computational	python based	Philip N. Klein Coding the Matrix: linear algebra through computer science applications			
			advanced	John H. Hubbard, Barbara Burke Hubbard Vector Calculus, Linear Algebra, and Differential Forms: a unified approach, 5 ed.	John H. Hubbard, Barbara Burke Hubbard Student Solution Manual Vector Calculus, Linear Algebra, and Differential Forms: a unified approach, 5 ed.		

	differential forms	John H. Hubbard, Barbara Burke Hubbard Vector Calculus, Linear Algebra, and Differential Forms: a unified approach, 5 ed. <	John H. Hubbard, Barbara Burke Hubbard Student Solution Manual Vector Calculus, Linear Algebra, and Differential Forms: a unified approach, 5 ed. <				
		Peter Collier A Beginner's Guide to Differential Forms	Peter Collier A Most Incomprehensible Thing: notes towards a very gentle introduction to the mathematics of relativity, 2nd printing ch 04: Introducing the Manifold <				
		differential geometry	Gerald Jay Sussman Functional Differential Geometry media: digital format: pdf location: library				
	discrete mathematics	Bernard Kolman Discrete Mathematical Structures, 6 ed.	Allan M. Stavely Programming and Mathematical Thinking: a gentle introduction to discrete math featuring Python				
			Arthur T. Benjamin Discrete Mathematics: media: digital format: CD publisher: The Great Courses note: selected tracks				
	numerical methods	Steven C. Chapra Numerical Methods for Engineers, 7 ed.	Timothy Sauer Numerical Analysis, 3 ed.				
computer science	java programming language	Cay S. Horstmann Core Java for the Impatient. 4 ed. note: his Core Java classics reduced to the absolute essentials.	Paul Deitel Java for programmers with Generative AI, 5 ed.				
			Cay S. Horstmann Core Java Volume I - Fundamentals, 11 ed.				
		advanced java programming	Raoul-Gabriel Urma Modern Java in Action				
			multicore programming	Maurice Naftalin Mastering Lambdas: Java programming in a multicore world			
		algorithms	Robert Sedgewick Algorithms, 4 ed.				
	python programming language	Allen Downey Think Python: how to think like a computer scientist					
	matlab	MathWorks Matlab Help Center media: digital format: HTML sec: MATLAB location: web url: https://www.mathworks.com/help/matlab/index.html?s_tid=hc_panel publisher: MathWorks					
	windows os	Pavel Yosifovich Windows Internals Part 1: system architecture processes, threads, memory management and more, 7 ed.					
information science	James V. Stone Information Theory: a tutorial introduction						
natural sciences physics chemistry biology	physics	John R. Taylor Classical Mechanics	T.M. Helliwell Modern Classical Mechanics				

	chemistry	inorganic	Peter Atkins Chemical Principles: the quest for Insight, 5th ed.	Ron B. Davis, Jr. Chemistry and Our Universe: how it all works media: video format: DVD publisher: The Great Courses		
			reaction kinetics	Michael J. Pilling Reaction Kinetics		
	biology	cell biology	Bruce Alberts Essential Cell Biology, 6 ed.			
			Rob Phillips, Ron Milo Cell Biology: by the numbers			
		molecular biology	David P. Clark Molecular Biology, 3 ed.	Kevin Ahern Biochemistry and Molecular Biology media: video format: DVD publisher: The Great Courses		
				David P. Clark Biotechnology: the technological applications of genetics and genomics, 3 ed. >		
		biotechnology	David P. Clark Biotechnology: the technological applications of genetics and genomics, 3 ed.			
engineering	systems	signals	Aydin Akin, Luis F. Chaparro Signals and Systems Using MATLAB, 4 ed. <			
	networks	M.E.J. Newman Networks: an introduction				
biosystems	biophysics	Philip Nelson Biological Physics: Energy, Information, Life				
	systems biology	Thomas Sauter, Marco Albrecht Introduction to Systems Biology: workbook for flipped-classroom teaching				
		modeling	Jesse M. Kinder, Philip Nelson A Student's Guide to Python For Physical Modeling, 2 ed. note: Code samples, data sets, updates, errata, and more are available at http://physicalmodelingwithpython.blogspot.co note: good complement for modeling applications			
			networks	Uri Alon An introduction to Systems Biology: design principles of biological circuits, 2 ed.		
				Hamid Bolouri Computational Modeling of Gene Regulatory Networks		
			mathematical	Philip Nelson Physical Models of Living systems		
				Alan Garfinkel Modeling Life: the mathematics of biological systems		
				Karthik Raman An Introduction to Computational Systems Biology: systems level modelling of cellular networks		
human biosystem	anatomy	Frederic H. Martini Anatomy & Physiology, 9 ed,				

		Irving P. Herman Physics of the Human Body, 2 ed. ch: selected					
		Jack H. Wilmore Physiology of Sport and Exercise, 8 ed. ch: selected					
		musculoskeletal system	Benno M. Nigg, ed. Biomechanics of the Musculo-skeletal System, 3 ed.	Margareta Nordin Basic Biomechanics of the Musculoskeletal System, 5 ed.			
			Jack H. Wilmore Physiology of Sport and Exercise, 8 ed. ch: selected <	Irving P. Herman Physics of the Human Body, 2 ed. ch: selected <			
		spine	Fabio Galbusera Biomechanics of the spine: Basic Concepts, Spinal Disorders, and Treatments				
		eye	Philip Nelson From Photon to Neuron: light, imaging, vision				
	physiology	Frederic H. Martini Anatomy & Physiology, 9 ed, <					
		exercise physiology	Jack H. Wilmore Physiology of Sport and Exercise, 8 ed. ch: selected				
	aging	Roger B. McDonald Biology of Aging					
	medical science	disorders	systems approach	Uri Alon Systems Medicine: physiological circuits and the dynamics of disease			
			cancer	modeling	Vittorio Cristini Multiscale Modeling of Cancer: an integrated experimental and mathematical modeling approach		
					Vittorio Cristini An Introduction to Physical Oncology: how mechanistic mathematical modeling can improve cancer therapy outcomes note: TBO		
			neuromuscular	sarcopenia	Kunihiro Sakuma, Ed. Sarcopenia: Molecular Mechanism and Treatment Strategies		
					Alfonso J. Cruz-Jentoft, Ed. Sarcopenia, 2 ed.		
					Chad Cox, Ed. Clinical Nutrition and Aging: Sarcopenia and Muscle Metabolism		
social sciences	Intelligence	Daniel Goleman Emotional Intelligence: when it can matter more than IQ					