801 Introduction to Computational Modeling  
Fall. 3(3-0) RB: One semester of introductory calculus: NSC 801  
Introduction to computational modeling using a wide variety of application examples. Algorithmic thinking and model building, data visualization, numerical methods, all implemented as programs. Command line interfaces. Scientific software development techniques including modular programming, testing, and version control.

802 Methods in Computational Modeling  
Spring. 3(3-0) RB: (CMSE 801) or equivalent experience: NSC 802  
Standard computational modeling methods and tools. Programming and code-management techniques.

820 Mathematical Foundations of Data Science  
Spring. 3(3-0) RB: CMSE 802 or equivalent experience in programming and numerical methods. Differential equations at the level of (MTH 235 or MTH 255H or (MTH 340 and MTH 442) or (MTH 347H and MTH 442)). Linear algebra at the level of (MTH 309 or MTH 317H). Probability and statistics at the level of STT 231.  
Fundamental mathematical principles of data science that underlie the algorithms, processes, and methods of data-centric thinking, and tools based on these principles.

821 Numerical Methods for Differential Equations  
Spring. 3(3-0) RB: CMSE 802 or equivalent experience in programming and numerical methods. Differential equations at the level of (MTH 235 or MTH 255H or (MTH 340 and MTH 442) or (MTH 347H and MTH 442)). Linear algebra at the level of (MTH 309 or MTH 317H).  

822 Parallel Computing  
Fall. 3(3-0) Interdepartmental with Computer Science and Engineering. Administered by Computational Mathematics, Science, and Engineering. RB: Calculus at the level of MTH 133. Ability to program proficiently in C/C++, basic understanding of data structures and algorithms (both at the level of CSE 232). Basic linear algebra and differential equations.  

823 Numerical Linear Algebra  
Fall. 3(3-0) RB: (CMSE 802) or equivalent experience in programming and numerical methods. Linear algebra at the level of MTH 309 or MTH 317H.  