Computational Neuroscience Track worksheet  
(14 courses required or 15 for Honors)

Math and Statistics (3 courses)
☐ 1. Multivariable Calculus: Math 19a*, Math 21a, 22b, 23b, 25b, 55b, Applied Math 21a, or 22b  
☐ 2. Linear Algebra: Math 18/19b*, 21b, 22a, 23a, 25a, 55a, Applied Math 21b, or 22a  
☐ 3. Statistics 110  
* Not recommended for students planning to take additional Math/Applied Math courses (or Modeling/Analysis electives with higher math pre-reqs).

Computer Science (2 courses)
☐ 4. CS 50  
☐ 5. CS 51 or 61

Foundational Biology (2 courses)
☐ 6. Any one of the following (courses with labs are underlined):  

- LS 1a or LPSA Chemistry, Molecular/Cell Bio,  
- LS 1b Genetics, Genomics, Evolution  
- LS 2 Evolutionary Human Physiology and Anatomy,  
- HEB 1420 Human Anatomy  
- MCB 60 Cell Biology,  
- MCB 63 Biochemistry,  
- MCB 64 Cell Biology,  
- MCB 65 Physical Biochemistry,  
- MCB 68 Cell Bio & Microscopy  
- OEB 50 Population Genetics,  
- OEB 53 Evolutionary Biology  
- SCRB 50 Building a Body

☐ 7. One approved 100-level HEB, MCB, OEB, or SCRB course (or any second course from the box above)

Neurobiology (5 courses)
☐ 8. Neuro 80: Neurobiology of Behavior  
☐ 9. Neuro 105, Neuro 115, Neuro 120 (Neuro 120 strongly recommended)  
☐ 10. Additional Quantitative Elective:  

- APMTH 226: Neural Computation,  
- BME 130 Neural Control of Movement  
- BME 131: Neuroengineering,  
- BME 129: Intro to Bioelectronics  
- Neuro 105 Systems Neuroscience,  
- Neuro 115 Cellular Basis of Neuronal Function,  
- Neuro 120 Introductory Computational Neuroscience,  
- Neuro 130 Visual Recognition  
- MCB 131 Computational Neuroscience,  
- Neuro 140 Artificial and Biological Intelligence,  
- Neuro 141 Physics of Sensory Systems,  
- Psych 1401 Cognitive Computational Neuro  
- Psych 1406 Biological and Artificial Visual Systems,  
- Psych 1451 Debugging the brain


Modeling and Analysis (2 courses) Any two courses from our approved list:  
https://www.mcb.harvard.edu/undergraduate/neuroscience/neuro-courses/?course-button=compneurotrack

☐ 13. ____________________________  
☐ 14. ____________________________

Honors – optional

☐ 15. Neuro 91 Laboratory Research or LS100 Experimental Research  
or completion of a senior thesis
**Computational Track Electives:** The following list of classes count as modeling/analysis electives for students on the Computational Neuroscience Track. Additional courses may be petitioned for approval.

APM 50: Intro to Applied Mathematics  
APM 104: Series Expansions and Complex Analysis  
APM 105: Ordinary and Partial Differential Equations  
APM 107: Graph Theory and Combinatorics  
APM 108: Nonlinear Dynamical Systems  
APM 111: Intro Scientific Computing  
APM 120: Applied Linear Algebra and Big Data  
APM 232: Learning, estimation and control of Dynamical Systems

BME 110: Physiological Systems Analysis

CS 108: Intelligent Systems: Design and Ethical Challenges  
CS 109: Intro to Data Science  
CS 121: Intro to Theory of Computation  
CS 124: Data Structures and Algorithms  
CS 143: Computer Networks  
CS 181: Machine Learning  
CS 182: Artificial Intelligence

CS 187: Computational Linguistics

ENG-SCI/APM 115: Mathematical Modeling  
ENG-SCI/APM 121: Intro to Optimization  
ENG-SCI 155: Systems and Control  
ENG-SCI 157: Biological Signal Processing

MCB 111: Mathematics in Biology  
MCB 112: Biological Data Analysis  
MCB 198: Advanced Math Techniques for Modern Biology  
MCB 199: Statistical Thermodynamics and Quantitative Biology

Psych 2030: Bayesian Data Analysis

Stat 108: Computing Software  
Stat 111: Theoretical Inference  
Stat 115: Intro Computational Biology  
Stat 117: Data Analysis in Modern Biostatistics  
Stat 120: Introduction to Bayesian Inference and Applications  
Stat 121: Data Science  
Stat 131: Time Series  
Stat 139: Linear Models  
Stat 149: Generalized Linear Models  
Stat 171: Stochastic Processes  
Stat 185: Introduction to Dimension Reduction  
Stat 195: Statistical Machine Learning  
Stat 220: Bayesian Data Analysis