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

Math and Statistics (3 courses)
1. Multivariable Calculus: Math 19a*: Math 21a, 22a, 23b, 25b, 55b, Applied Math 21a, or 22b
2. Linear Algebra: Math 18/19b*, 21b, 22b, 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, or Psych 1401
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