



**Collaborative
Accelerated M.S.
Program in Neuroscience
Plan of Study**



See the WPI Graduate Catalog and the Neuroscience webpages for additional information about the Neuroscience MS degree requirements.

Student: _____
Assumption ID#: _____
WPI ID#: _____
Email Address: _____
Bachelor's Degree: _____
Entry Date: _____
Expect. MS Completion Date: _____
WPI Academic Advisor: _____

☐ **General Collaborative Accelerated Master's Programs Framework Requirements:**

- ☐ The equivalent of at most 12 graduate credits can be double-counted toward the bachelor's and M.S. degrees.
- ☐ Within this 12-graduate credit maximum, eligible senior-level Assumption and 4000-level WPI undergraduate courses (listed below) count toward the M.S. degree in Neuroscience only if:
 - ☐ They are taken before students graduate with their bachelor's degree.
 - ☐ The course grade is a "B-" or higher.
 - ☐ At most 2 eligible Assumption undergraduate courses can be counted.
- ☐ Restricted course combinations are provided in a table at the end of this document.

☐ **Core Neuroscience Coursework Requirement:** at least 19 graduate credits.

☐ **Neuroscience courses:** at least 9 graduate credits from the list of Eligible Neuroscience Courses

School	Course #	Course Title	Semester	Grad credits	Grade	Double-counted?

☐ **Biology course(s):** at least 3 graduate credits from the list of Eligible Biology & Biotechnology Courses

School	Course #	Course Title	Semester	Grad credits	Grade	Double-counted?

☐ **Computer Science course(s):** at least 3 graduate credits from the list of Eligible Computer Science Courses

School	Course #	Course Title	Semester	Grad credits	Grade	Double-counted?

☐ **Bioethics course:** at least 1 graduate credit. *For example, BB 551 Research Integrity in the Sciences or ID 500 Responsible Conduct of Research. Assumption's PHI 262 Biomedical Ethics course may be used to satisfy the Ethics requirement of the M.S. degree in Neuroscience, but it will carry 0 credits toward the MS degree.*

School	Course #	Course Title	Semester	Grad credits	Grade	Double-counted?

- ☐ **Scientific Writing or Experimental Design course:** at least 3 graduate credits. *For example, BB 553 Experimental Design and Statistics in the Life Sciences, MA 546 Design and Analysis of Experiments or ID 527 Fundamentals of Scientific Teaching and Pedagogy.*

School	Course #	Course Title	Semester	Grad credits	Grade	Double-counted?

- ☐ **MS Thesis (optional):** 9 graduate credits. Conducted at WPI.

The thesis must be advised or co-advised by a faculty member affiliated with the WPI Neuroscience Program.

- ☐ MS thesis proposal.

*Must be submitted to and approved by the Neuroscience Faculty Steering Committee **before the student receives grades for more than 3 MS thesis credits.** Normally students submit thesis proposals during their 2nd or 3rd semester.*

- ☐ MS thesis reader assigned.

MS thesis reader will be assigned by the Neuroscience Program Director when the MS thesis proposal is approved. The reader must be a Neuroscience-affiliated faculty in a department different from that(those) of the thesis advisor(s).

Reader's Name: _____

- ☐ 9 MS thesis credits NEU599. *Only 9 MS thesis credits may be applied towards the MS degree.*

Course #	Course Title	Semester	Credits	Grade
NEU 599	Master's Thesis			
NEU 599	Master's Thesis			
NEU 599	Master's Thesis			
NEU 599	Master's Thesis			

- ☐ Public Thesis presentation to the WPI Neuroscience Faculty.

- ☐ Final thesis approval. *Title page signed by advisor(s), reader, and Neuroscience program director.*

- ☐ **Research or practice-oriented internship (optional):** 3 graduate credits. Conducted at WPI.

The internship is to be carried out in cooperation with a sponsoring organization or affiliated research lab and must be approved and overseen by a faculty member affiliated with the Neuroscience program.

Course #	Sponsoring organization / research lab	Semester	Credits	Grade

- ☐ **Program electives to satisfy the remainder of the 31-credit requirement** from any of the lists of Eligible Courses

If the research or practice-oriented internship option is used, this list of electives must include a Neuroscience course (3 grad credits) in addition to the 3 Neuroscience courses (9 graduate credits) in the Core Neuroscience Coursework Requirement.

School	Course #	Course Title	Semester	Grad credits	Grade	Double-counted?

Student's Signature and Date: _____

WPI Advisor Signature and Date: _____

Assumption Advisor Signature and Date: _____

WPI Neuroscience Program Director Signature and Date: _____

LISTS OF ELIGIBLE COURSES

For courses marked with (‡), () or (**), please see Notes at the end of this section.*

Eligible Neuroscience courses:

WPI Graduate Courses (3 graduate credits each):

NEU 501 Neuroscience (‡)
NEU 502 Neural Plasticity
NEU 503 Computational Neuroscience
NEU 504 Advanced Psychophysiology
NEU 505 Brain-Computer Interaction

Assumption Undergraduate Courses:

BIO415 Principles of Neuroscience (3 graduate credits)

- Students can receive credit towards their M.S. degree for BIO415 or for NEU501, but not for both.

BIO490 Independent Study with Neuroscience Focus (2 graduate credits)

- This ISC may be conducted with Assumption University and/or WPI faculty.

Eligible Bioinformatics and Computational Biology courses:

WPI Graduate Courses (3 graduate credits each):

BCB 501/BBT 581 Bioinformatics (*)
BCB 502/CS 582 Bio visualization
BCB 503/CS 583 Biological and Biomedical Database Mining
BCB 504/MA 584 Statistical Methods in Genetics and Bioinformatics (*)
BCB 510 Bioinformatics and Computational Biology Seminar

WPI Undergraduate Courses (2 graduate credits each):

BCB 4001/BB4801. Bioinformatics (**)
BCB 4002/CS 4802. Biovisualization (**)
BCB 4003/CS 4803. Biological and Biomedical Database Mining (**)
BCB 4004/MA 4603. Statistical Methods in Genetics and Bioinformatics (**)

Eligible Biology and Biotechnology courses:

WPI Graduate Courses (3 graduate credits each):

BBT 561 Model Systems: Experimental Approaches and Applications
BBT 581/ BCB 501 Bioinformatics

WPI Undergraduate Courses (2 graduate credits each):

BB/CH 4190. Regulation of Gene Expression (**)
BB 4260. Synthetic Biology (**)

Assumption Undergraduate Courses:

BIO420 Developmental Biology (3 graduate credits)
BIO430 Comparative Physiology (3 graduate credits)

Eligible Biomedical Engineering courses:

WPI Graduate Courses (3 graduate credits each):

BME 550 Tissue Engineering
BME 555 BioMEMS and Tissue Micro engineering
BME 560 Physiology for Engineers

BME 583 Biomedical Microscopy and Quantitative Imaging

WPI Undergraduate Courses (2 graduate credits each):

BME/ECE 4011. Biomedical Signal Analysis (**)

BME 4201. Biomedical Imaging (**)

Eligible Chemistry and Biochemistry courses:

WPI Graduate Courses (3 graduate credits each):

CH 520 Cell Signaling

CH 538 Medicinal Chemistry

CH 541 Membrane Biophysics

CH 555D Drug and Regulations

CH 555R Drug Safety and Regulatory Compliance

CH 555/PH597 Cell Mechanics

WPI Undergraduate Courses (2 graduate credits each):

CH 4110. Protein Structure and Function (**)

CH 4120. Lipids and Biomembrane Functions (**)

CH 4160. Membrane Biophysics (**)

CH 4170. Experimental Genetic Engineering (**)

Assumption Undergraduate Courses:

CHE414 Biochemistry (3 graduate credits)

Eligible Computer Science courses:

WPI Graduate Courses (3 graduate credits each):

CS 5007 Introduction to Applications of Computer Science with Data Structures and Algorithms

CS 5084 Introduction to Algorithms: Design and Analysis

CS 528 Mobile and Ubiquitous Computing

CS 534 Artificial Intelligence

CS 539 Machine Learning

CS 541/DS 541 Deep Learning

CS 542 Database Management Systems

CS 546 Human-Computer Interaction

CS 548 Knowledge Discovery and Data Mining

CS/RBE 549 Computer Vision

CS/SEME 565 User Modeling

CS/SEME 566 Graphical Models for Reasoning under Uncertainty

CS/SEME 567 Empirical Methods for Human-Centered Computing

CS 573 Data Visualization

CS 584 Algorithms: Design and Analysis

CS 585/DS 503 Big Data Management

CS 586/DS 504 Big data Analytics

WPI Undergraduate Courses (2 graduate credits each):

CS 4341. Introduction to Artificial Intelligence (**)

CS 4342. Machine Learning (**)

CS 4432. Database Systems II (**)

CS 4445. Data Mining and Knowledge Discovery in Databases (**)

CS 4518. Mobile and Ubiquitous Computing (**)

CS 4802/BCB 4002. Biovisualization (**)

CS 4803/BCB 4003. Biological and Biomedical Database Mining (**)

Eligible Data Science courses:

WPI Graduate Courses (3 graduate credits each):

- DS 501 Introduction to Data Science (*)
- DS 502/MA 543 Statistical Methods for Data Science

WPI Undergraduate Courses (2 graduate credits each):

- DS 4635/MA 4635. Data Analytics and Statistical Learning (**)

Eligible Mathematical Sciences courses:

WPI Graduate Courses (3 graduate credits each):

- MA 508 Mathematical Modeling
- MA 543/DS 502 Statistical Methods for Data Science
- MA 510/CS 522 Numerical Methods
- MA 511 Applied Statistics for Engineering and Scientists
- MA 542 Regression Analysis
- MA 546 Design and Analysis of Experiments
- MA 550 Time Series Analysis
- MA 556 Applied Bayesian Statistics

WPI Undergraduate Courses (2 graduate credits each):

- MA 4631. Probability and Mathematical Statistics I (**)
- MA 4632. Probability and Mathematical Statistics II (**)
- MA 4635/DS 4635. Data Analytics and Statistical Learning (**)

Eligible Psychology courses:

WPI Undergraduate Courses (2 graduate credits each):

- PSY 4800. Special Topics in Psychological Science (**)
- PSY 4900. Advanced Research in Psychological Science (**)

Assumption Undergraduate Courses:

- PSY402 Social and Affective Neuroscience (2 graduate credits)
- PSY403 Cognitive Neuroscience (2 graduate credits)

NOTES:

- Other graduate courses, graduate research credits, or Independent Study Grad Courses (ISGs) may be used to satisfy Neuroscience MS degree requirements with prior approval of the WPI Neuroscience Director.
- Courses marked with (‡): At Assumption University:
 - NEU 501 will satisfy the BIO415 requirement for the Neuroscience Major with a Cellular Path, Neuroscience Major with a Psychology Path, and the Biology Major with a concentration in neuroscience and behavior.
 - NEU 501 will count as a Quantitative elective or Biology elective in the Biology major.
 - However, NEU 501 will not satisfy the 400-level elective requirement at Assumption. For example, the Biology Major with a Concentration in Neuroscience and Behavior and the Neuroscience Major with a Cellular Path must take at least one 400 level biology course with a lab, or CHE414 with a lab, at Assumption University.
- Courses marked with (*): At Assumption University, one of the WPI elective graduate courses marked with (*) above will count as a "Biology elective" or "Quantitative Elective" in the following programs at Assumption: Neuroscience Major with a Cellular Path, Biology Major with a Concentration in Neuroscience and Behavior, and Biology Major. For Assumption students pursuing a Neuroscience Major with a Psychology Path, elective graduate courses marked with (*) above will count as an "elective". A second WPI graduate course marked with (*) will count as a general biology elective course at Assumption.

- Courses marked with (**): At Assumption University, the undergraduate WPI courses marked with (**) above will count towards an undergraduate major (listed below) at Assumption, provided a student earns a letter grade of "C" or higher. WPI undergraduate courses marked with (**) will count as a "Biology Elective" or "Quantitative Elective" in the following programs at Assumption: Neuroscience Major with a Cellular Path, Biology Major with a Concentration in Neuroscience and Behavior, and Biology Major. For Assumption students pursuing a Neuroscience Major with a Psychology Path, elective undergraduate courses marked with (**) will count as an "elective".

Restricted Course Combinations:

The following table lists courses that have significant overlap in their content; a student may receive credit towards their M.S. degree in Neuroscience at WPI for at most one of the courses in each row below:

Courses from Assumption University and WPI	
Assumption Course	WPI Course
BIO 415 Principles of Neuroscience	NEU 501 Neuroscience
WPI Courses in Bioinformatics and Computational Biology	
Undergraduate Course	Graduate Course
BCB 4001/BB4801. Bioinformatics	BCB 501/BBT 581 Bioinformatics
BCB 4002/CS 4802. Biovisualization	BCB 502/CS 582 Biovisualization
BCB 4004/MA 4603. Statistical Methods in Genetics and Bioinformatics	BCB 504/MA 584 Statistical Methods in Genetics and Bioinformatics
WPI Courses in Computer Science	
Undergraduate Course	Graduate Course
CS 4341 Introduction to Artificial Intelligence	CS 534 Artificial Intelligence
CS 4342 Machine Learning	CS 539 Machine Learning
CS 4432 Database Systems II	CS 542 Database Management Systems
CS 4518 Mobile and Ubiquitous Computing	CS 528 Mobile and Ubiquitous Computing
WPI Courses in Mathematics and Data Science	
Undergraduate Course	Graduate Course
MA 4631 Probability and Mathematical Statistics I	MA 540 Probability and Mathematical Statistics I
MA 4632 Probability and Mathematical Statistics II	MA 541 Probability and Mathematical Statistics II
DS 4635/MA 4635 Data Analytics and Statistical Learning	MA 543/DS 502 Statistical Methods for Data Science