

# GRADUATE SCHOOL OF BIOMEDICAL SCIENCES



## Degree Requirements Academic Year 2019-2020

This document includes all degree requirements for programs in the Graduate School of Biomedical Sciences. A table of contents is included below.

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# Graduate Degree Plan

## PhD in Cancer & Cell Biology

Students Starting Academic Year: 2019-2020

### General Degree Requirements:

- Completion of at least 180 term hours
- At least 30 of those term hours must be in Didactic courses
- Completion of at least three terms of Research Rotation
- Students must maintain satisfactory academic progress as detailed in the Student Handbook

### Year One Requirements:

Term 1:	GS-GS-6600	Foundations A: Molecules to Systems	3 (Didactic) <i>(two-term course)</i>	Total to Date
	GS-GS-6400	Foundations B: Biostatistics	2 (Didactic) <i>(two-term course)</i>	
	GS-GS-5101	Responsible Conduct of Research 1	1	
	GS-GS-5111	Success Strategies for Graduate School	1	
	GS-CC-5100	Student Research Seminar	1	
	GS-CC-5030	Research Rotation ± Electives	4	
	Total:			
Term 2:	GS-GS-6600	Foundations A: Molecules to Systems	3 (Didactic) <i>(two-term course)</i>	Total to Date
	GS-GS-6400	Foundations B: Biostatistics	2 (Didactic) <i>(two-term course)</i>	
	GS-GS-5112	Powerful Presentations	1	
	GS-CC-5100	Student Research Seminar	1	
	GS-CC-5030	Research Rotation ± Electives	5	
	Total:			
Term 3:	GS-GS-6202	Gene Regulation	2 (Didactic)	Total to Date
	GS-CC-6208	Cellular Signaling	2 (Didactic)	
	GS-GS-5105	Scientific Writing	1	
	GS-CC-5100	Student Research Seminar	1	
	GS-CC-5030	Research Rotation ± Electives	6	
	Total:			
Term 4:	GS-CC-6302	Molecular Carcinogenesis	3 (Didactic)	Total to Date
	GS-CC-5100	Student Research Seminar	1	
	GS-GS-5113	Effective Project Design & Management	1	
	GS-CC	Research Hours ± Electives	7	
	Total			
Term 5:	GS-CC	Research Hours ± Electives	12	Total to Date:
	Total:			12

## Year Two Requirements:

Term 1:	GS-CC-5301	NRSA Grant Writing & Project Dev. 1	3	Total to Date 72 (17)
	GS-CC-5100	Student Research Seminar	1	
	GS-CC	Research Hours ± Electives	8	
	Total:		12	
Term 2:	GS-CC-5302	NRSA Grant Writing & Project Dev. 2	3	Total to Date 84 (17)
	GS-CC-5100	Student Research Seminar	1	
	GS-GS-5102	Responsible Conduct of Research 2	1	
	GS-CC	Research Hours ± Electives	7	
	Total:		12	
Term 3:	GS-CC-5100	Student Research Seminar	1	Total to Date 96 (17)
	GS-CC	Research Hours ± Electives	11	
	Total:		12	
<i>Student's Thesis Advisory Committee must be appointed by the end of Term 3 in the student's second year of enrollment.</i>				
Term 4:	GS-CC-5100	Student Research Seminar	1	Total to Date 108 (17)
	GS-CC	Research Hours ± Electives	11	
	Total:		12	
Term 5:	GS-CC	Research Hours ± Electives	12	Total to Date 120 (17)
			12	

*Remaining required didactic hours should be elective courses*

## Qualifying Exam Requirement:

- Must be taken by the end of the second year of enrollment.
- Student must complete all prerequisite activities defined by their program before taking the exam

## Year Three Requirements:

Terms 1-4:	GS-CC-5100	Student Research Seminar	4 total
Term 3:	GS-GS-5103	Responsible Conduct of Research 3	1
Terms 1-5:	GS-CC-5050	Dissertation	55 total

## Year Four Requirements:

Terms 1-4:	GS-CC-5100	Student Research Seminar	4 total
Term 3:	GS-GS-5104	Responsible Conduct of Research 4	1
Terms 1-5:	GS-CC-5050	Dissertation	55 total

## Research Course Work:

GS-CC-5010	Readings
GS-CC-5030	Research Rotation
GS-CC-5040	Special Projects
GS-CC-5050	Dissertation

Students Starting Academic Year: 2019-2020

## General Degree Requirements:

- Completion of at least 180 term hours
- At least 30 of those term hours must be in Didactic courses
- Completion of at least three terms of Research Rotation
- Students must maintain satisfactory academic progress as detailed in the Student Handbook

## Year One Requirements:

Term 1:	GS-GS-6600	Foundations A: Molecules to Systems	3 (Didactic) <i>(two-term course)</i>	Total to Date
	GS-GS-6400	Foundations B: Biostatistics	2 (Didactic) <i>(two-term course)</i>	
	GS-CP-5101	Thinking Like a Scientist 1	1	
	GS-GS-5101	Responsible Conduct of Research 1	1	
	GS-CP-5100	Student Research Seminar	1	
	GS-CP-5030	Research Rotation ± Electives	4	
	Total:			
Term 2:	GS-GS-6600	Foundations A: Molecules to Systems	3 (Didactic) <i>(two-term course)</i>	Total to Date
	GS-GS-6400	Foundations B: Biostatistics	2 (Didactic) <i>(two-term course)</i>	
	GS-CP-6202	Thinking Like a Scientist 2	2 (Didactic)	
	GS-CP-5100	Student Research Seminar	1	
	GS-CP-5030	Research Rotation ± Electives	4	
	Total:			
Term 3:	GS-CP-6203	Thinking Like a Scientist 3	2 (Didactic)	Total to Date
	GS-CP-5100	Student Research Seminar	1	
	GS-CP-5030	Research Rotation ± Electives	9	
	Total:			
Term 4:	GS-CP-6204	Thinking Like a Scientist 4	2 (Didactic)	Total to Date
	GS-CP-5100	Student Research Seminar	1	
	GS-CP	Research Hours ± Electives	9	
	Total:			
Term 5:	GS-CP	Research Hours ± Electives	12	Total to Date
	Total:			

## Year Two Requirements:

Term 1:	GS-CP-6304	Molecular Biophysics 1	3 (Didactic)	Total to Date
	GS-CP-5100	Student Research Seminar	1	
	GS-CP	Research Hours ± Electives	8	
	Total:			
Term 2:	GS-GS-5102	Responsible Conduct of Research 2	1	Total to Date
	GS-CP-5100	Student Research Seminar	1	
	GS-CP	Research Hours ± Electives	10	
	Total:			

Term 3:	GS-CP-5100	Student Research Seminar	1	Total to Date
	GS-CP	Research Hours ± Electives	11	
	Total:		12	
<i>Student's Thesis Advisory Committee must be appointed by the end of Term 3 in the student's second year of enrollment.</i>				
Term 4:	GS-CP-5100	Student Research Seminar	1	Total to Date
	GS-CP	Research Hours ± Electives	11	
	Total:		12	
Term 5:	GS-CP	Research Hours ± Electives	12	Total to Date
			12	120 (19)

*Remaining required didactic hours should be elective courses*

### Qualifying Exam Requirement:

- Must be taken by the end of the second year of enrollment.
- Student must complete all prerequisite activities defined by their program before taking the exam

### Year Three Requirements:

Terms 1-4:	GS-CP-5100	Student Research Seminar	4 total	
Term 3:	GS-GS-5103	Responsible Conduct of Research 3	1	
Terms 1-5:	GS-CP-5050	Dissertation	55 total	

### Year Four Requirements:

Terms 1-4:	GS-CP-5100	Student Research Seminar	4 total	
Term 3:	GS-GS-5104	Responsible Conduct of Research 4	1	
Terms 1-5:	GS-CP-5050	Dissertation	55 total	

### Research Course Work:

GS-CP-5010	Readings
GS-CP-5030	Research Rotation
GS-CP-5040	Special Projects
GS-CP-5050	Dissertation

### Suggested Electives

#### Chemical Biology/Pharmacology Emphasis

GS-CP-6401	General Pharmacology	4(D)
GS-CP-6302	Chemical Concepts in Chemical Biology	3(D)
GS-CP-6206	Drug Discovery	2(D)
GS-CP-6205	Chemical Biology	2(D)

### Suggested Electives

#### Structural Biology/Biophysics Emphasis

GS-CP-6305	Molecular Biophysics 2	3(D)
GS-CP-6301	Advanced X-ray Crystallography	3(D)
GS-CP-6207	Electron Cryomicroscopy	2(D)

# Graduate Degree Plan

## PhD in Clinical Scientist Training Program

Students Starting Academic Year: 2019-2020

### General Degree Requirements:

- Completion of at least 180 term hours
- At least 30 of those term hours must be in Didactic courses (6000-level)
- Students must maintain satisfactory academic progress as detailed in the Student Handbook

### Year One Requirements:

Term 1:	GS-CT-6300	Fundamentals of Clinical Investigation	3 (Didactic)	Total to Date
	GS-CT-6201	CICS 1: Grant Development for CIs	2 (Didactic)	
	GS-CT-5101	Responsible Conduct of Research for CIs	1	
	GS-CT	Special Projects ± Electives	6	
Total:			12 (5)	12 (5)
Term 2:	GS-CT-6302	CICS 2: Clinical Trials for CIs	3 (Didactic)	Total to Date
	GS-CT	Special Projects ± Electives	9	
	Total:			
Term 3:	GS-CT-6303	CICS 3: Translational Research for CIs	3 (Didactic)	Total to Date
	GS-CT	Special Projects ± Electives	9	
	Total:			

*Student's Thesis Advisory Committee must be appointed by the end of term 3 of the student's first year of enrollment.*

Term 4:	GS-CT-6304	CICS 4: Health Services Research for CIs	3 (Didactic)	Total to Date
	GS-CT	Special Projects ± Electives	9	
	Total:			
Term 5:	GS-CT-6205	CICS 5: Evaluating a Completed Career Development Grant	2 (Didactic)	Total to Date
	GS-CT	Special Projects ± Electives	10	
	Total:			

### Year Two Requirements:

Term 1:	GS-CT	Research Hours ± Electives	12	Total to Date
	Total:			
Term 2:	GS-CT	Research Hours ± Electives	12	Total to Date
	Total:			
Term 3:	GS-CT	Research Hours ± Electives	12	Total to Date
	Total:			
Term 4:	GS-CT	Research Hours ± Electives	12	Total to Date
	Total:			
Term 5:	GS-CT	Research Hours ± Electives	12	Total to Date
	Total:			

*Remaining required didactic hours should be elective courses*

### Qualifying Exam Requirement:

- Must be taken by the end of Term 2 of the second year of enrollment
- All phases of the exam process must be completed before a result is indicated
- Any student earning an Incomplete on any phase of the exam must retake the exam within six months.

**Biostatistics Requirement:**

Students are required to take GS-GS-6400 Foundations B: Biostatistics, or a substitute biostatistics course approved by the Program Director

**Recommended Electives:**

Term 3	GS-QC-6201	Applications to Biology of Computation	2 (Didactic)
Term 3	GS-GS-5105	Scientific Writing	1
Term 4	GS-QC-6302	Computer-Aided Discovery Methods	3 (Didactic)
Term 5	GS-CP-6202	Drug Discovery: Bench to Bedside	2 (Didactic)

# Graduate Degree Plan

## MS in Clinical Scientist Training Program

Students Starting Academic Year: 2019-2020

### General Degree Requirements:

- Completion of at least 84 term hours
- At least 30 of those term hours must be in Didactic courses (6000-level)
- Students must maintain satisfactory academic progress as detailed in the Student Handbook

### Year One Requirements:

Term 1:	GS-CT-6300	Fundamentals of Clinical Investigation	3 (Didactic)	Total to Date
	GS-CT-6201	CICS 1: Grant Development for CIs	2 (Didactic)	
	GS-CT-5101	Responsible Conduct of Research for CIs	1	
	GS-CT	Special Projects ± Electives	6	
Total:			12 (5)	12 (5)
Term 2:	GS-CT-6302	CICS 2: Clinical Trials for CIs	3 (Didactic)	Total to Date
	GS-CT	Special Projects ± Electives	9	
	Total:			
Term 3:	GS-CT-6303	CICS 3: Translational Research for CIs	3 (Didactic)	Total to Date
	GS-CT	Special Projects ± Electives	9	
	Total:			

*Student's Thesis Advisory Committee must be appointed by the end of term 3 of the student's first year of enrollment.*

Term 4:	GS-CT-6304	CICS 4: Health Services Research for CIs	3 (Didactic)	Total to Date
	GS-CT	Special Projects ± Electives	9	
	Total:			
Term 5:	GS-CT-6205	CICS 5: Evaluating a Completed Career Development Grant	2 (Didactic)	Total to Date
	GS-CT	Special Projects ± Electives	10	
	Total:			

### Quantifying Progress Review Requirement:

- Takes place following first year of coursework

### Year Two Requirements:

Term 1:	GS-CT	Research Hours ± Electives	12	Total to Date
	Total:			
Term 2:	GS-CT	Research Hours ± Electives	12	Total to Date
	Total:			
Term 3:	GS-CT	Research Hours ± Electives	12	Total to Date
	Total:			
Term 4:	GS-CT	Research Hours ± Electives	12	Total to Date
	Total:			
Term 5:	GS-CT	Research Hours ± Electives	12	Total to Date
	Total:			

*Remaining required didactic hours should be elective courses*



**Biostatistics Requirement:**

Students are required to take GS-GS-6400 Foundations B: Biostatistics, or a substitute biostatistics course approved by the Program Director

**Recommended Electives:**

Term 3	GS-QC-6201	Applications to Biology of Computation	2 (Didactic)
Term 3	GS-GS-5105	Scientific Writing	1
Term 4	GS-QC-6302	Computer-Aided Discovery Methods	3 (Didactic)
Term 5	GS-CP-6202	Drug Discovery: Bench to Bedside	2 (Didactic)

# Graduate Degree Plan

## PhD in Development, Disease Models & Therapeutics

Students Starting Academic Year: 2019-2020

### General Degree Requirements:

- Completion of at least 180 term hours
- At least 30 of those term hours must be in Didactic courses
- Completion of at least three terms of Research Rotation
- Students must maintain satisfactory academic progress as detailed in the Student Handbook

### Year One Requirements:

Term 1:	GS-GS-6600	Foundations A: Molecules to Systems	3 (Didactic) <i>(two-term course)</i>	Total to Date
	GS-GS-6400	Foundations B: Biostatistics	2 (Didactic) <i>(two-term course)</i>	
	GS-GS-5101	Responsible Conduct of Research 1	1	
	GS-GS-5111	Strategies for Success in Graduate School	1	
	GS-DD-5030	Research Rotation ± Electives	5	
	Total:			
Term 2:	GS-GS-6600	Foundations A: Molecules to Systems	3 (Didactic) <i>(two-term course)</i>	Total to Date
	GS-GS-6400	Foundations B: Biostatistics	2 (Didactic) <i>(two-term course)</i>	
	GS-GS-5112	Powerful Presentations	1	
	GS-TB-467	Seminar in TBMM	1	
	GS-DD-5030	Research Rotation ± Electives	5	
	Total:			
<i>Students must file a degree plan supplement with at least 7 credits 6000-level GS-DD coursework by November 30.</i>				
Term 3:	GS-TB-467	Seminar in TBMM	1	Total to Date
	GS-GS-5105	Scientific Writing	1	
	GS-DD-5110	DDMT Journal Club	1	
	GS-DD-5030	Research Rotation ± Electives	9	
	Total:			
Term 4:	GS-TB-467	Seminar in TBMM	1	Total to Date
	GS-GS-5113	Effective Project Design & Management	1	
	GS-DD-5110	DDMT Journal Club	1	
	GS-DD	Research Hours ± Electives	9	
	Total:			
Term 5:	GS-DD	Research Hours ± Electives	11	Total to Date
	GS-DD-5110	DDMT Journal Club	1	
	Total:			
<b>Year Two Requirements:</b>				
Term 1:	GS-DD	Research Hours ± Electives	12	Total to Date
	Total:			12

Term 2:	GS-GS-5102	Responsible Conduct of Research 2	1	Total to Date 84 (10)
	GS-DD-5101	Effectively Writing & Reviewing Proposals	1	
	GS-DD-5100	Student Research Seminar	1	
	GS-DD	Research Hours ± Electives	9	
	Total:		12	
Term 3:	GS-DD-5100	Student Research Seminar	1	Total to Date 96 (10)
	GS-DD-5110	DDMT Journal Club	1	
	GS-DD	Research Hours ± Electives	10	
	Total:		12	

*Student's Thesis Advisory Committee must be appointed by the end of Term 3 in the student's second year of enrollment.*

Term 4:	GS-DD-5100	Student Research Seminar	1	Total to Date 108 (10)
	GS-DD-5110	DDMT Journal Club	1	
	GS-DD	Research Hours ± Electives	10	
	Total:		12	
Term 5:	GS-DD-5110	DDMT Journal Club	1	Total to Date 120 (10)
	GS-DD	Research Hours ± Electives	11	
	Total:		12	

*Remaining required didactic hours should be elective courses*

### Qualifying Exam Requirement:

- Must be taken by the end of the second year of enrollment.
- Student must complete all prerequisite activities defined by their program before taking the exam

### Year Three Requirements:

Terms 1-4:	GS-DD-5100	Student Research Seminar	4 total	
Term 3:	GS-GS-5103	Responsible Conduct of Research 3	1	
Terms 1-5:	GS-DD-5050	Dissertation	55 total	

### Year Four Requirements:

Terms 1-4:	GS-DD-5100	Student Research Seminar	4 total	
Term 3:	GS-GS-5104	Responsible Conduct of Research 4	1	
Terms 1-5:	GS-DD-5050	Dissertation	55 total	

### Research Course Work:

GS-DD-5010	Readings
GS-DD-5030	Research Rotation
GS-DD-5040	Special Projects
GS-DD-5050	Dissertation

# Graduate Degree Plan

## PhD in Genetics & Genomics

Students Starting Academic Year: 2019-2020

### General Degree Requirements:

- Completion of at least 180 term hours
- At least 30 of those term hours must be in Didactic courses
- Completion of at least three terms of Research Rotation
- Students must maintain satisfactory academic progress as detailed in the Student Handbook

### Year One Requirements:

Term 1:	GS-GS-6600	Foundations A: Molecules to Systems	3 (Didactic) <i>(two-term course)</i>	Total to Date
	GS-GS-6400	Foundations B: Biostatistics	2 (Didactic) <i>(two-term course)</i>	
	GS-GS-5101	Responsible Conduct of Research 1	1	
	GS-GG-5100	Student Research Seminar	1	
	GS-GG-5030	Research Rotation ± Electives	5	
	Total:			
Term 2:	GS-GS-6600	Foundations A: Molecules to Systems	3 (Didactic) <i>(two-term course)</i>	Total to Date
	GS-GS-6400	Foundations B: Biostatistics	2 (Didactic) <i>(two-term course)</i>	
	GS-GG-6201	Model Systems Genetics	2 (Didactic)	
	GS-GG-5100	Student Research Seminar	1	
	GS-GG-5030	Research Rotation ± Electives	4	
	Total:			
Term 3:	GS-GG-6202	Mammalian Genetics	2 (Didactic)	Total to Date
	GS-GG-6204	Method & Logic in Genetics & Genomics	2 (Didactic)	
	GS-GG-5105	Genetics & Genomics Journal Club	1	
	GS-GG-5100	Student Research Seminar	1	
	GS-GS-5105	Scientific Writing	1	
	GS-GG-5030	Research Rotation ± Electives	5	
Total:			12 (4)	36 (16)
Term 4:	GS-GG-6302	Human Genetics	3 (Didactic)	Total to Date
	GS-IY-6303	Fundamentals of Effective Grant Writing	2 (Didactic)	
	GS-GG-5105	Genetics & Genomics Journal Club	1	
	GS-GG-5100	Student Research Seminar	1	
	GS-GG	Research Hours ± Electives	5	
	Total:			
Term 5:	GS-GG-5105	Genetics & Genomics Journal Club	1	Total to Date
	GS-GG	Research Hours ± Electives	11	
	Total:			

### Year Two Requirements:

Term 1:	GS-GG-5100	Student Research Seminar	1	Total to Date
	GS-GG	Research Hours ± Electives	11	
	Total:			

Term 2:	GS-GG-5100	Student Research Seminar	1	Total to Date 84 (19)
	GS-GS-5102	Responsible Conduct of Research 2	1	
	GS-GG	Research Hours ± Electives	10	
	Total:		12	
Term 3:	GS-GG-5105	Genetics & Genomics Journal Club	1	Total to Date 96 (19)
	GS-GG-5100	Student Research Seminar	1	
	GS-GG	Research Hours ± Electives	10	
	Total:		12	

*Student's Thesis Advisory Committee must be appointed by the end of Term 3 in the student's second year of enrollment.*

Term 4:	GS-GG-5105	Genetics & Genomics Journal Club	1	Total to Date 108 (19)
	GS-GG-5100	Student Research Seminar	1	
	GS-GG	Research Hours ± Electives	10	
	Total:		12	
Term 5:	GS-GG-5105	Genetics & Genomics Journal Club	1	Total to Date 120 (19)
	GS-GG	Research Hours ± Electives	11	
	Total:		12	

*Remaining required didactic hours should be elective courses*

### Qualifying Exam Requirement:

- Must be taken by the end of the second year of enrollment
- All phases of the exam process must be completed before a result is indicated
- Any student earning an Incomplete on any phase of the exam must retake the exam within six months.

### Year Three Requirements:

Terms 1-4:	GS-GG-5100	Student Research Seminar	4 total	
Term 3:	GS-GS-5103	Responsible Conduct of Research 3	1	
Terms 1-5:	GS-GG-5050	Dissertation	55 total	

### Year Four Requirements:

Terms 1-4:	GS-GG-5100	Student Research Seminar	4 total	
Term 3:	GS-GS-5104	Responsible Conduct of Research 4	1	
Terms 1-5:	GS-GG-5050	Dissertation	55 total	

### Research Course Work:

GS-GG-5010	Readings
GS-GG-5030	Research Rotation
GS-GG-5040	Special Projects
GS-GG-5050	Dissertation

# Graduate Degree Plan

## PhD in Immunology & Microbiology

Students Starting Academic Year: 2019-2020

### General Degree Requirements:

- Completion of at least 180 term hours
- At least 30 of those term hours must be in Didactic courses
- Completion of at least three terms of Research Rotation
- Students must maintain satisfactory academic progress as detailed in the Student Handbook

### Year One Requirements:

Term 1:	GS-GS-6600	Foundations A: Molecules to Systems	3 (Didactic) <i>(two-term course)</i>	Total to Date
	GS-GS-6400	Foundations B: Biostatistics	2 (Didactic) <i>(two-term course)</i>	
	GS-GS-5101	Responsible Conduct of Research 1	1	
	GS-GS-5111	Strategies for Success in Graduate School	1	
	GS-IY-6401	Concepts in Host Immune System- Microbe Interactions	2 (Didactic) <i>(two-term course)</i>	
	GS-IY-5105	Seminars in Immunology & Microbiology	1	
	GS-IY-5110	Literature Review in I & M	1	
	GS-IY-5030	Research Rotation	1	
Total:			12 (7)	12 (7)
Term 2:	GS-GS-6600	Foundations A: Molecules to Systems	3 (Didactic) <i>(two-term course)</i>	Total to Date
	GS-GS-6400	Foundations B: Biostatistics	2 (Didactic) <i>(two-term course)</i>	
	GS-GS-5112	Powerful Presentations	1	
	GS-IY-6401	Concepts in Host Immune System- Microbe Interactions	2 (Didactic) <i>(two-term course)</i>	
	GS-IY-5100	Student Research Seminar	1	
	GS-IY-5105	Seminars in Immunology & Microbiology	1	
	GS-IY-5110	Literature Review in I & M	1	
	GS-IY-5030	Research Rotation	1	
Total:			12 (7)	24 (14)
Term 3:	GS-IY-6302	Grand Challenges and Methods in Immunology & Microbiology	3 (Didactic)	Total to Date
	GS-GS-5105	Scientific Writing	1	
	GS-IY-5100	Student Research Seminar	1	
	GS-IY-5105	Seminars in Immunology & Microbiology	1	
	GS-IY-5110	Literature Review in I & M	1	
	GS-IY-5030	Research Rotation ± Electives	5	
Total:			12 (3)	36 (17)
Term 4:	GS-IY-6303	Fundamentals of Effective Grant Writing	3 (Didactic)	Total to Date
	GS-GS-5113	Effective Project Design & Management	1	
	GS-IY-5100	Student Research Seminar	1	
	GS-IY-5105	Seminars in Immunology & Microbiology	1	
	GS-IY-5110	Literature Review in I & M	1	
	GS-IY	Research Hours ± Electives	5	
Total:			12 (3)	48 (20)
Term 5	GS-IY	Research Hours ± Electives	12	Total to Date
Total:			12	60 (20)

<b>Year Two Requirements:</b>				
Term 1:	GS-IY-5105	Seminars in Immunology & Microbiology	1	Total to Date 73 (20)
	GS-IY-5110	Literature Review in I & M	1	
	GS-IY	Research Hours ± Electives	10	
	Total:		12	
Term 2:	GS-IY-5100	Student Research Seminar	1	Total to Date 85 (20)
	GS-IY-5105	Seminars in Immunology & Microbiology	1	
	GS-IY-5110	Literature Review in I & M	1	
	GS-GS-5102	Responsible Conduct of Research 2	1	
	GS-IY	Research Hours ± Electives	8	
	Total:		12	
Term 3:	GS-IY-5100	Student Research Seminar	1	Total to Date 97 (20)
	GS-IY-5105	Seminars in Immunology & Microbiology	1	
	GS-IY-5110	Literature Review in I & M	1	
	GS-IY	Research Hours ± Electives	9	
	Total:		12	
<i>Student's Thesis Advisory Committee must be appointed by the end of Term 3 in the student's second year of enrollment.</i>				
Term 4:	GS-IY-5100	Student Research Seminar	1	Total to Date 109 (20)
	GS-IY-5105	Seminars in Immunology & Microbiology	1	
	GS-IY-5110	Literature Review in I & M	1	
	GS-IY	Research Hours ± Electives	9	
	Total:		12	
Term 5:	GS-IY	Research Hours ± Electives	12	Total to Date 121 (20)
	Total:		12	
<i>Remaining required didactic hours should be elective courses</i>				
<b>Qualifying Exam Requirement:</b>				
<ul style="list-style-type: none"> <li>• Must be taken by the end of the second year of enrollment.</li> <li>• Student must complete all prerequisite activities defined by their program before taking the exam</li> </ul>				
<b>Year Three Requirements:</b>				
Terms 2-4:	GS-IY-5100	Student Research Seminar	3 total	
Terms 1-4:	GS-IY-5105	Seminars in Immunology & Microbiology	4 total	
Terms 1-4:	GS-IY-5110	Literature Review in I & M	4 total	
Term 3:	GS-GS-5103	Responsible Conduct of Research 3	1	
Terms 1-5:	GS-IY-5050	Dissertation	48 total	
<b>Year Four Requirements:</b>				
Terms 2-4:	GS-IY-5100	Student Research Seminar	3 total	
Terms 1-4:	GS-IY-5105	Seminars in Immunology & Microbiology	4 total	
Terms 1-4:	GS-IY-5110	Literature Review in I & M	4 total	
Term 3:	GS-GS-5104	Responsible Conduct of Research 3	1	
Terms 1-5:	GS-IY-5050	Dissertation	48 total	
<b>Research Course Work:</b>				
	GS-IY-5010	Readings		
	GS-IY-5030	Research Rotation		
	GS-IY-5040	Special Projects		
	GS-IY-5050	Dissertation		

# Graduate Degree Plan

## PhD in Neuroscience

Students Starting Academic Year: 2019-2020

### General Degree Requirements:

- Completion of at least 180 term hours
- At least 30 of those term hours must be in Didactic courses
- Completion of at least three terms of Research Rotation
- Students must maintain satisfactory academic progress as detailed in the Student Handbook

### Year One Requirements:

Term 1:	GS-NE-5111	Neuroscience Lab 1	1	Total to Date
	GS-NE-6303	Electrical Signaling in the Brain	3 (Didactic)	
	GS-NE-6304	Brain Cell Biology & Development	3 (Didactic)	
	GS-GS-5101	Responsible Conduct of Research 1	1	
	GS-NE-5030	Research Rotation ± Electives	4	
Total:			12 (6)	12 (6)
Term 2:	GS-NE-6201	Analyses of Neuronal Function	2 (Didactic)	Total to Date
	GS-NE-6202	Anatomy of the Nervous System	2 (Didactic)	
	GS-NE-6112	Neuroscience Lab 2	1 (Didactic)	
	GS-NE-5100	Neuroscience Seminar Journal Club	1	
	GS-NE-5030	Research Rotation ± Electives	6	
Total:			12 (5)	24 (11)
Term 3:	GS-NE-6301	Neural Systems 1	3 (Didactic)	Total to Date
	GS-NE-6203	Genetics for Neuroscience	2 (Didactic)	
	GS-NE-5100	Neuroscience Seminar Journal Club	1	
	GS-NE-5030	Research Rotation ± Electives	6	
Total:			12 (5)	36 (16)
Term 4:	GS-NE-6302	Neural Systems 2	3 (Didactic)	Total to Date
	GS-NE-6101	Core Concepts in Computational Neuroscience	1 (Didactic)	
	GS-NE-6204	Neurobiology of Disease	2 (Didactic)	
	GS-NE-5100	Neuroscience Seminar Journal Club	1	
	GS-NE	Research Hours ± Electives	5	
Total:			12 (6)	48 (22)
Term 5:	GS-NE	Research Hours ± Electives	12	Total to Date
	Total:			12

### Year Two Requirements:

Term 1:	GS-GS-6400	Foundations B: Biostatistics	2 (Didactic) <i>(two-term course)</i>	Total to Date
	GS-NE	Research Hours ± Electives	10	
Total:			12 (2)	72 (24)



Term 2:	GS-GS-6400	Foundations B: Biostatistics	2 (Didactic) <i>(two-term course)</i>	Total to Date
	GS-NE-5101	Preparing for your Neuroscience Qualifying Exam	1	
	GS-GS-5102	Responsible Conduct of Research 2	1	
	GS-NE-5100	Neuroscience Seminar Journal Club	1	
	GS-NE	Research Hours ± Electives	7	
	Total:		12 (2)	
Term 3:	GS-NE-5100	Neuroscience Seminar Journal Club	1	Total to Date
	GS-NE	Research Hours ± Electives	11	
	Total:		12	
<i>Student's Thesis Advisory Committee must be appointed by the end of Term 3 in the student's second year of enrollment.</i>				
Term 4:	GS-NE-5100	Neuroscience Seminar Journal Club	1	Total to Date
	GS-NE	Research Hours ± Electives	11	
	Total:		12	
Term 5:	GS-NE	Research Hours ± Electives	12	Total to Date
			12	120 (26)

*Remaining required didactic hours should be elective courses*

### Qualifying Exam Requirement:

- Must be taken by the end of the second year of enrollment.
- Student must complete all prerequisite activities defined by their program before taking the exam

### Year Three Requirements:

Terms 1-5:	GS-NE-5050	Dissertation	59	
Term 3:	GS-GS-5103	Responsible Conduct of Research 3	1	

### Year Four Requirements:

Terms 1-5:	GS-NE-5050	Dissertation	59	
Term 3:	GS-GS-5104	Responsible Conduct of Research 4	1	

### Research Course Work:

GS-NE-5010	Readings
GS-NE-5030	Research Rotation
GS-NE-5040	Special Projects
GS-NE-5050	Dissertation

# Graduate Degree Plan

## PhD in Quantitative & Computational Biosciences

Students Starting Academic Year: 2019-2020

### General Degree Requirements:

- Completion of at least 180 term hours
- At least 30 of those term hours must be in Didactic courses
- Completion of at least three terms of Research Rotation
- Students must maintain satisfactory academic progress as detailed in the Student Handbook

### Year One Requirements:

Term 1:	GS-GS-6600	Foundations A: Molecules to Systems	3 (Didactic) <i>(two-term course)</i>	Total to Date
	GS-GS-6400	Foundations B: Biostatistics	2 (Didactic)	
	GS-QC-6301	Practical Introduction to Programming for Scientists	3 (Didactic)	
	GS-GS-5101	Responsible Conduct of Research 1	1	
	GS-QC-5105	Seminar in Quantitative Biosciences	1	
	GS-QC-5110	Advanced Topics in QCB	1	
	GS-QC-5030	Research Rotation	1	
Total:			12 (8)	12 (8)
Term 2:	GS-GS-6600	Foundations A: Molecules to Systems	3 (Didactic) <i>(two-term course)</i>	Total to Date
	GS-GS-6400	Foundations B: Biostatistics	2 (Didactic)	
	GS-QC-6801	Computational Mathematics for Quantitative Biomedicine	4 (Didactic) <i>(two-term course)</i>	
	GS-QC-5105	Advanced Topics in QCB	1	
	GS-QC-5110	Seminar in Quantitative Biosciences	1	
	GS-QC-5030	Research Rotation	1	
Total:			12 (9)	24 (17)
Term 3:	GS-QC-6801	Computational Mathematics for Quantitative Biomedicine	4 (Didactic) <i>(two-term course)</i>	Total to Date
	GS-GS-5105	Scientific Writing	1	
	GS-QC-5105	Seminar in Quantitative Biosciences	1	
	GS-QC-5030	Research Rotation ± Electives	6	
Total:			12 (4)	36 (21)
Term 4:	GS-QC-5301	QCB Research Design	3	Total to Date
	GS-QC-5105	Seminar in Quantitative Biosciences	1	
	GS-QC-5100	Student Research Seminar	1	
	GS-QC	Research Hours ± Electives	7	
Total:			12	48 (21)
Term 5:	GS-QC	Research Hours ± Electives	12	Total to Date
	Total:			12

## Year Two Requirements:

Term 1:	GS-QC-5105	Seminar in Quantitative Biosciences	1	Total to Date
	GS-QC	Research Hours ± Electives	11	
	Total:		12	72 (21)
Term 2:	GS-QC-5105	Seminar in Quantitative Biosciences	1	Total to Date
	GS-GS-5102	Responsible Conduct of Research 2	1	
	GS-QC	Research Hours ± Electives	10	
	Total:		12	
Term 3:	GS-QC-5105	Seminar in Quantitative Biosciences	1	Total to Date
	GS-QC	Research Hours ± Electives	11	
	Total:		12	96 (21)
<i>Student's Thesis Advisory Committee must be appointed by the end of Term 3 in the student's second year of enrollment.</i>				
Term 4:	GS-QC-5105	Seminar in Quantitative Biosciences	1	Total to Date
	GS-QC-5100	Student Research Seminar	1	
	GS-QC	Research Hours ± Electives	10	
	Total:		12	
Term 5:	GS-QC	Research Hours ± Electives	12	Total to Date
	Total:		12	120 (21)

*Remaining required didactic hours should be elective courses*

## Qualifying Exam Requirement:

- Must be taken by the end of the second year of enrollment.
- Student must complete all prerequisite activities defined by their program before taking the exam

## Year Three Requirements:

Terms 1-4:	GS-QC-5105	Seminar in Quantitative Biosciences	4 total	
Term 3:	GS-GS-5103	Responsible Conduct of Research 3	1	
Term 4:	GS-QC-5100	Student Research Seminar	1	
Terms 1-5:	GS-QC-5050	Dissertation	54 total	

## Year Four Requirements:

Terms 1-4:	GS-QC-5105	Seminar in Quantitative Biosciences	4 total	
Term 3:	GS-GS-5104	Responsible Conduct of Research 4	1	
Term 4:	GS-QC-5100	Student Research Seminar	1	
Terms 1-5:	GS-QC-5050	Dissertation	54 total	

## Research Course Work:

GS-QC-5010	Readings
GS-QC-5030	Research Rotation
GS-QC-5040	Special Projects
GS-QC-5050	Dissertation