



Neuroscience Student Guide 2020-21



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Purpose

This guide is a resource to aid undergraduate students interested in a Neuroscience major to successfully pursue this degree. It includes useful information on scheduling courses, selecting a concentration, and deciding on electives to take. Please use this guide to discover opportunities and suggested courses suited for your degree and future career interests within the Neuroscience field. Please also reach out to the College of Science and Health Advising Office as well as your advisor and explore our website. Our goal is to make sure that every student has access to any information they need to pursue an undergraduate degree in Neuroscience and to help them succeed academically. We look forward to working with you!

Locations and Link

Main Offices: McGowan North, room 124 (Director); Byrne Hall, room 563 (Associate Director)

Phone: (773)-325-2091; (773)-325-4136

Neuroscience Major Website: https://csh.depaul.edu/academics/neuroscience/Pages/default.aspx

Faculty and Staff Contact Information

Name	Office	Extension	E-mail
Dr. Clark Elliot (Computational Neuroscience)	CDM 649	(312)-362-8627	elliott@cdm.depaul.edu
Dr. Peter Hastings (Computational Neuroscience)	CDM 717	(312)-362-5736	peterh@cdm.depaul.edu
Dr. Dorothy Kozlowski (Behavioral Neuroscience)	McGN 106	(773)-325-2191	dkozlows@depaul.edu
Dr. Austin Lim (Cellular/Molecular Neuroscience)	McGS 403H	(773)-325-8473	SLIM21@depaul.edu
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Dr. Elizabeth Rottenberg (Philosophy of Mind) Dr. Kavin Thompson (Naurosthia)	LAS 150-17	(773)-325-4864	erottenb@depaul.edu
Dr. Kevin Thompson (Neuroethics)	LAS 150-24	(773)-325-4866	kthomp12@depaul.edu
Dr. Sandra Virtue (Cognitive Neuroscience)	Byrne 563	(773)-325-4136	svirtue@depaul.edu

Academic Advising

Neuroscience Majors are advised by **Jaimie Engle**, except for NEU majors that are also **Pathways Honors Students**, who are advised by **Lindsey Burdick** and **Lauren Paez**. Be sure to meet with your academic advisor at least once a quarter to ensure that you are on track for completing the Neuroscience major at your desired graduation time. If you do not know who your academic advisor is, please check your Blue Star account. If you plan to go on to medical school, also meet with a pre-health advisor.

Jaimie Engle, M.S. McGowan North, 121 (773)-325-7595 jengle@depaul.edu

Office of Advising McGowan South, 400 (773)-325-8490 CSHAdvising@depaul.edu You may also contact the Neuroscience Program directors for advising:

Dr. Eric Norstrom McGowan South Rm 412G dkozlows@depaul.edu (773)-325-2191

Dr. Sandra Virtue Byrne 563 svirtue@depaul.edu (773)-325-4136

Neuroscience Program Learning Outcomes

Students with a major in Neuroscience will be able to:

- 1.Describe how the cellular and systems level structure of the nervous system is responsible for neurological function, behavior, and cognition.
- 2.Critically evaluate scientific literature in order to communicate core concepts in a clear and organized mannerboth verbally and in writing.
- 3.Design and analyze scientific experiments.
- 4.Explain challenges surrounding ethical thinking posed by advancements in neuroscience.
- 5. Relate neuroscience content to other scientific and non-scientific disciplines.

Summary of the Neuroscience Curriculum — See below for a summary of each component. Please always refer to the University Catalog for the most up to date curriculum: https://www.depaul.edu/university-catalog/degree-requirements/undergraduate/csh/neuroscience-bs/Pages/default.aspx

Liberal Studies Program

Neuroscience Core

Neuroscience Concentration Courses

Open Electives

Total

17 courses

11 courses

12 courses

8 courses

48 courses

Liberal Studies Program

Neuroscience majors will participate in the liberal studies program in the following way:

First Year Program 4 courses Explore/Discover, Focal Point, WRD 103, and WRD 104 Sophomore Seminar 1 course LS Learning Domains Arts & Literature 3 courses Philosophical Inquiry 2 courses * **Religious Dimensions** 2 courses * Self, Society, and Modern World 1 course** **Understanding the Past** 2 courses **Experiential Learning:** 1 course Senior Capstone 1 course*** TOTAL 17 courses

*One of the four PI and RD courses must come from the following:

PHL 200 Ethical Theories.

PHL 230 Contemporary Issues in Ethics.

PHL 229 Biomedical Ethics REL 229 Biomedical Ethics

HLTH 229 Ethics in the Health Sciences.

CSC 208 Ethics in the Digital Age.

PHL 228 Neuroethics – if you chose Neuroethics: please register for **PHL** 228 if you intend to use this course for a PI or RD designation, and use **NEU** 228 if you will be taking it as an elective.

Neuroscience Core

The core is designed to address the following learning goals for all students graduating with a B.S. in Neuroscience:

- 1. To understand how the components of the nervous system are organized, function, and relate to behavior and cognition.
- 2. To evaluate scientific literature in neuroscience critically, formulate hypotheses, and design scientific experiments through multiple perspectives.
- 3. To understand basic techniques used in neuroscience research. To process, analyze, model, integrate, and/or interpret data from multiple disciplines within neuroscience.
- 4. To communicate about neuroscience verbally and in writing in a clear, reasoned, and discipline-specific manner.
- 5. To recognize the impact that neuroscience has and will have on ethics and society and their reciprocal interaction.
- 6. To articulate how disciplines such as humanities, social sciences, and natural sciences interact with neuroscience to address historical, contemporary, and future scientific challenges.

Required Courses for Neuroscience Core:

General Biology I, II, III BIO 191, 192, 193

General Chemistry I, II CHE 130/131, 132/133 or CHE 120/121, 122/123

Survey of Organic Chemistry CHE 228/229

Students who take Organic Chemistry can substitute one quarter of it for this requirement.

Intro to Psychology I, II PSY 105, 106

Statistics BIO 206 or PSY 240 or IT223 or MAT242

Introduction to Neuroscience NEU 201
Research Methods NEU 301
Capstone in Neuroscience NEU 390*

^{**}PSY 105 and 106 will fulfill the other two SSMW requirements

^{***}NEU 390 Capstone in Neuroscience is strongly encouraged

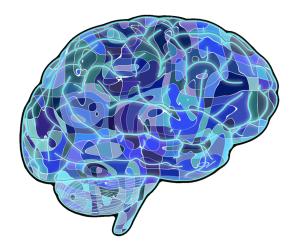
^{*}Students can take other capstones when circumstances prevent that from taking NEU 390 when offered, but NEU 390 is strongly recommended.

Concentrations

The four concentrations in the Neuroscience major represent major sub-disciplines within neuroscience. By default, students are placed into the Integrative Concentration, but can choose any concentration that suits their goals and interests:

- A. <u>Cellular/Molecular Neuroscience</u>, for students who are interested in the cellular and molecular mechanisms that are involved in the functioning of the nervous system and how they relate to the creation of behavior or play a role in disease.
- B. <u>Behavioral/Cognitive Neuroscience</u>, for students who are interested in understanding how the nervous system is involved in behaviors such as sensation/perception, movement and cognitive functioning that includes learning, memory, and emotion.
- C. <u>Computational Neuroscience</u>, for students who are interested in quantitative and computational modeling methods to understand the functions of the nervous system and behavior and/or in the design of human-made devices that duplicate nervous system functioning.
- D. <u>Integrative Neuroscience</u>, for students who would like a more integrative approach and include multiple aspects of neuroscience in their curriculum. This concentration is also good for students who are undecided, switch majors, transfer in with credits, are pursuing a health career with defined prerequisites, or have an ongoing curriculum that makes it difficult to fulfill requirements of the other concentrations.

See the following pages for a representative timeline for each concentration.



Cellular/Molecular Neuroscience Concentration

All students in this concentration will take the following required courses in addition to the major core (prerequisites in parenthesis) and 6 major electives from an approved list of courses seen in Table 5.

CHE 134/135 - Gen Chem III (CHE 132/133) BIO 250 - Cell biology (BIO 193, CHE 134)

BIO 260 – Genetics (BIO 193)

BIO 360 – Molecular biology (BIO 250, BIO 260, CHE 228)

BIO/NEU 339 – Cellular Neurobiology (BIO 250 or PSY 377)

BIO 340 – Behavioral Neuroscience (NEU 201 or BIO/NEU 339 or BIO 307 or 308/ HLTH 301 or PSY 377)

Table 1 – Sample timeline for students in the Cellular/Molecular Neuroscience Concentration.

Red = LSP requirements Blue = Neuro requirements Green = Concentration courses

	Autumn Quarter	Winter Quarter	Spring Quarter
YEAR	BIO191	BIO192	BIO193
1	CHE130/131	CHE132/133	CHE134/135
	WRD103	WRD104	PSY105
	LSP110/111	LSP112	Open Elective
YEAR	NEU201 Intro to	NEU/PHL228-	NEU 301 – NEU Research
2	Neuroscience	Neuro/Ethics or other	Methods
	PSY106	Ethics course	CHE228/229
	BIO206 or PSY 240	BIO250	BIO260
	Open Elective	LSP200	Learning Domain
		Learning Domain	
YEAR	BIO/NEU339	BIO340	NEU Elective
3	BIO360	NEU Elective	Learning Domain
	Learning Domain	Learning Domain	Learning Domain
	Open Elective	NEU Elective	EL
YEAR	NEU Elective	NEU Elective	NEU390 Senior Capstone
4	Learning Domain	Learning Domain	NEU Elective
	Learning Domain	Open Elective	Open Elective
	Open Elective	Open Elective	Open Elective

Behavioral/Cognitive Neuroscience Concentration

All students in this concentration will take the following required courses in addition to the major core (prerequisites in parenthesis) and 7 major electives from an approved list of courses seen in Table 5.

BIO 307 Animal Physiology (BIO 250) OR BIO 308 - Human Physiology (BIO 250) OR HLTH 301 - Human Anatomy & Physiology (BIO 193) BIO/NEU 339 - Cellular Neurobiology (BIO 250 or PSY 377) BIO 340 - Behavioral Neuroscience (NEU 201 or BIO/NEU 339 or BIO 307 or 308/ HLTH 301 or PSY 377) BIO 342 - Cognitive Neuroscience (NEU 201 or BIO/NEU 339 or 340, or PSY 377)

OR PSY 379 - Cognitive Neuroscience

PSY 360 - Theories of Learning and Cognition (PSY 105 & 106) OR PSY 373 - Happiness, Judgment and Decision Making (PSY 105 & 106)

Table 2 – Sample timeline for students in the Behavioral/Cognitive Neuroscience Concentration. Red = LSP requirements Blue = Neuro requirements Green = Concentration courses

	Autumn Quarter	Winter Quarter	Spring Quarter
YEAR 1	BIO191 CHE130/131 WRD103 LSP110/111	BIO192 CHE132/133 WRD104 LSP112	BIO193 CHE228/229 PSY105 Open Elective
YEAR 2	NEU201 Intro to Neuroscience PSY106 BIO206 or PSY 240 Open Elective	NEU/PHL228- Neuro/Ethics or other Ethics course [BIO310 or HLTH 301 - Anatomy & Physiology] LSP 200 Learning Domain	NEU 301 – NEU Research Methods NEU Elective Learning Domain Learning Domain
YEAR 3	BIO/NEU 339-Cellular Neuro [PSY 360 or PSY 373] Learning Domain Learning Domain	BIO340-Behavioral Neuro NEU Elective Learning Domain Open Elective	[BIO342 or PSY 379- Cognitive Neuro] NEU Elective Learning Domain EL
YEAR 4	NEU Elective NEU Elective Learning Domain Open Elective	NEU Elective Learning Domain Open Elective Open Elective	NEU390 Senior Capstone NEU Elective Open Elective Open Elective

Computational Neuroscience Concentration

All students in this concentration will take the following required courses in addition to the major core (prerequisites in parenthesis) and 6 major electives from an approved list of courses seen in Table 5.

MAT 150 – Calculus I (Mat 131) CSC 241– Introduction to Computer Science I (MAT 130)

NEU 256 – Introduction to Computational Neuroscience * (MAT 150 & CSC 241 & NEU 201)

CSC 250 – Computers and Human Intelligence

CSC 367 – Introduction to Data Mining (IT 223 or BIO 206 or PSY 240)

CSC 381 – Introduction to Image Processing (MAT 150)

Table 3 – Sample timeline for students in the Computational Neuroscience Concentration.

Red = LSP requirements Blue = Neuro requirements Green = Concentration courses

	Autumn Quarter	Winter Quarter	Spring Quarter
YEAR	BIO191	BIO192	BIO193
1	CHE130/131	CHE132/133	MAT150
	WRD103	WRD104	Open Elective
	LSP110/111	LSP112	PSY105
YEAR	NEU201 Intro to	NEU/PHL228-	NEU 301 – NEU Research
2	Neuroscience	Neuro/Ethics or other	Methods
	PSY106	Ethics course	CHE228/229
	IT223 or BIO 206 or PSY	LSP 200	Learning Domain
	240	NEU256 Intro Comp	CSC250
	Open Elective	Neuro	
		CSC 241	
YEAR	NEU Electives	CSC367	CSC381
3	Learning Domain	NEU Elective	NEU Elective
	Learning Domain	Learning Domain	Learning Domain
	Open Elective	Learning Domain	EL
YEAR	NEU Elective	NEU Elective	NEU 390 Senior Capstone
4	Learning Domain	Learning Domain	NEU Elective
	Learning Domain	Open Elective	Open Elective
	Open Elective	Open Elective	Open Elective

^{*} Intro to Computational Neuroscience provides an introduction to basic computational methods for understanding what nervous systems do and how they function. The course covers the structure of the brain, from neurons to circuits to regions, and also the computational and theoretical approaches to model the brain. The course will introduce students to the physiology of individual neurons, how they communicate through synapses and firing, and how they work together to create systems that control, learn and memorize. The course will include the application of mathematical and computational models to neural systems.

Integrative Neuroscience Concentration

For students who want a more integrated neuroscience major or who are pre-health, undecided, switch majors, transfer in with credits, or have a curriculum that makes it difficult to fulfill requirements of the other concentrations, the Integrative Concentration will require the following in addition to the major core requirements (prerequisites in parenthesis) and 6 major electives from the list in Table 5.

One course from the following:

BIO/NEU 339 – Cellular Neurobiology (BIO 250 or PSY 377)
BIO 340 – Behavioral Neuroscience (NEU 201 or BIO/NEU 339 or BIO 307 or 308/ HLTH 301 or PSY 377)
BIO 342 or PSY 379 – Cognitive Neuroscience (NEU 201 or BIO/NEU 339 or 340, or PSY 377)

Five courses from any of the following:

BIO/NEU 339 - Cellular Neurobiology if not taken to fulfill requirement above if not taken to fulfill requirement above BIO 340 - Behavioral Neuroscience BIO 342/PSY 379 - Cognitive Neuroscience if not taken to fulfill requirement above CHE 134/135 - Gen Chemistry III (CHE 132/133) BIO 250 - Cell biology (BIO 193, CHE 134) BIO 260 - Genetics (BIO 193) (BIO250, BIO260, CHE 228) BIO 360 - Molecular biology BIO 307 – Animal Physiology (BIO 250) OR BIO 308 – Human Physiology (BIO 250) OR HLTH 301 - Human Anatomy & Physiology (BIO 193) PSY 360 - Theories of Learning and Cognition (PSY 105 & 106) PSY 373 – Happiness, Judgment and Decision Making (PSY 105 & 106) MAT 150 – Calculus I (Mat 131) CSC 241 - Introduction to Computer Science I (MAT 130) NEU 256 – Introduction to Computational Neuroscience CSC 250 - Computers and Human Intelligence CSC 367 - Introduction to Data Mining (IT 223 or BIO 206 or PSY 240) CSC 381 – Introduction to Image Processing (MAT 150)

Table 4- Sample timeline for students in the Integrative Concentration

Red = LSP requirements Blue = Neuro requirements Green = Concentration courses

	Autumn Quarter	Winter Quarter	Spring Quarter
YEAR	BIO191	BIO192	BIO193
1	CHE130/131	CHE132/133	CHE228/229
	WRD103	WRD104	Open Elective
	LSP110/111	LSP112	PSY105
YEAR	NEU201 Intro to	NEU/PHL228-	NEU 301- Neuroscience
2	Neuroscience	Neuroethics or other	Research Methods
	PSY106	Ethics course	NEU Elective
	BIO206 or PSY 240	NEU Conc Req	NEU Conc Req
	Open Elective	LSP 200	Learning Domain
	Learning Domain	Learning Domain	
YEAR	BIO/NEU 339-Cell Neuro	NEU Conc. Req	NEU Conc. Req
3	NEU Conc. Req	NEU Elective	NEU Elective
	Learning Domain	Learning Domain	Learning Domain
	Learning Domain	Open Elective	EL

YEAR	NEU Elective	NEU Elective	NEU 390 Senior Capstone
4	NEU Elective	Learning Domain	NEU Elective
	Learning Domain	Open Elective	Open Elective
	Open Elective	Open Elective	Open Elective

Table 5: Electives by Concentration

Cellular/Molecular	Behavioral/Cognitive	Computational
Pick 6 electives from list below:	Pick 7 electives from list below	Pick 7 electives from list below:
Tick o electives from fist below.	Tick / electives from list below	Tick / electives from list below.
NEU 228 – Neuroethics	NEU 228 – Neuroethics	NEU 301 – Neuroscience Research Methods
NEU256 - Introduction to	NEU 301 – Neuroscience Research	NEU 380- Topics in Neuroscience
Computational Neuroscience	Methods	NEU 228 – Neuroethics
NEU 301 – Neuroscience Research	NEU256 - Introduction to Computational	NEU399 Independent Study
Methods	Neuroscience	IM210 Introduction to Human Computer
NEU380- Topics in Neuroscience	NEU 380 – Topics in Neuroscience	Interaction
NEU399 - Independent Study	NEU399 - Independent Study	IT240 Introduction to Databases
NEU 228 - Neuroethics	NEU 228 – Neuroethics	CSC242 Introduction to Computer Science 2
BIO 201 – Anatomy	BIO 201 – Anatomy	CSC382 Image Analysis and its Applications
	BIO 210- Microbiology	CSC324 Data Analysis and Statistical
BIO 210- Microbiology BIO220 – Biotechnology	BIO220 – Biotechnology	Software
BIO 301 – Animal Behavior	BIO250 – Cell biology (L) [BIO193,	IT300 Research Experience
BIO307 – Animal Physiology (L)	CHE134]	CSC399 Independent Study
Or BIO 308 – Human Physiology (L)	BIO260 – Genetics (L) [BIO193]	BIO 210- Microbiology
BIO330 – Developmental Biology	BIO 301 – Animal Behavior	BIO220 – Biotechnology
BIO341 – Topics in Neurobiology	BIO 307 or 308	BIO250 – Cell biology (L) [BIO193,
BIO342 – Cognitive Neuroscience	BIO330 – Developmental Biology	CHE134]
BIO362 – Bioinformatics	BIO341 – Topics in Neurobiology	BIO 201 – Anatomy
BIO375 – Pharmacology	BIO360- Molecular Biology	BIO260 – Genetics (L) [BIO193]
BIO386 – Endocrinology	BIO362 – Bioinformatics	BIO 301 – Animal Behavior
CHE230/231, 232/233, 234/235	BIO375 – Pharmacology	BIO 307 or 308
Organic Chemistry (Can substitute for	BIO386 – Endocrinology	BIO330 – Developmental Biology
CHE 228)	CHE 134/135 Gen Chem III (CHE	BIO /NEU 339- Cellular Neurobiology
CHE 340 – Biochemistry	132/133)	BIO 340- Behavioral Neuroscience
CSC250 Computers and Human	CHE230/231, 232/233, 234/235 Organic	BIO341 – Topics in Neurobiology
Intelligence	Chemistry (Can substitute for CHE 228)	BIO 342 – Cognitive Neuroscience
CSC 241 Introduction to Computer	CHE 340 – Biochemistry	BIO 360- Molecular Biology
Science I	CSC250 Computers and Human	BIO362 – Bioinformatics
CSC 367 – Foundations of Data	Intelligence	BIO375 – Pharmacology
Science	CSC 241 Introduction to Computer	BIO386 – Endocrinology
CSC 381 Intro to Digital Image	Science I	CHE 134/135 Gen Chem III (CHE 132/133)
Processing	CSC 367 – Foundations of Data Science	CHE230/231, 232/233, 234/235 Organic
HLTH 302- Anatomy & Physiology	CSC 381 Intro to Digital Image Processing	Chemistry (Can substitute for CHE 228)
PHY 150/151/152 – General Physics	HLTH 302- Anatomy & Physiology	CHE 340 – Biochemistry
or PHY 170/171/172 or PHY 155/166	PHY 150/151/152 – General Physics or	HLTH 302- Anatomy & Physiology
PSY 317 – Psychology of	PHY 170/171/172 or PHY 155/166	PHY 150/151/152 – General Physics or PHY
Interpersonal Relationship	PSY 317 – Psychology of Interpersonal	170/171/172 or PHY 155/166
PSY 333 – Child Psychology	Relationship	PSY 317 – Psychology of Interpersonal
PSY 334 – Adolescent Psychology	PSY 333 – Child Psychology	Relationship
PSY 347 Social Psych	PSY 334 – Adolescent Psychology	PSY 333 – Child Psychology
PSY 348 – Social Cognition and	PSY 347 Social Psych	PSY 334 – Adolescent Psychology
Mental Control	PSY 348 – Social Cognition and Mental	PSY 347 Social Psych
PSY 353 Abnormal Psychology	Control	PSY 348 – Social Cognition and Mental
PSY 360 Theories of Learning and	PSY 353 Abnormal Psychology	Control
Cognition	PSY 360 Theories of Learning and	PSY 353 Abnormal Psychology
PSY 364 – Health Psychology	Cognition	PSY 360 Theories of Learning and Cognition
PSY 366- Behavior Problems of	PSY 364 – Health Psychology	PSY 364 – Health Psychology
Children	PSY 366- Behavior Problems of Children	PSY 366- Behavior Problems of Children
PSY 370 – Social and Emotional	PSY 370 – Social and Emotional	PSY 370 – Social and Emotional
Development	Development	Development Development
PSY 373 Happiness, Judgment and	PSY 373 Happiness, Judgment and	PSY 373 Happiness, Judgment and Decision-
Decision-making	Decision-making	making
PSY 377 Physiological Psychology	PSY 377 Physiological Psychology (PSY	PSY 377 Physiological Psychology (PSY
(PSY 105 or PSY 106, PSY 240, and	105 or PSY 106, PSY 240, and PSY 242)	105 or PSY 106, PSY 240, and PSY 242)
PSY 242)	105 01101 100,101 240, and 101 242)	105 51151 100,151 270, and 151 242)
101 272)		
101 272)		

8 open Electives	8 open electives	8 open electives

Pre-Med Students*: are encouraged to major in Neuroscience- Integrative so that requirements for the major and professional school can be met.

Requirements for Medical School admission below can be met with a combination of the major requirements, major electives, and liberal studies program:

1 year General Biology - NEU major requirement

1 year of General Chemistry – NEU major requirement + 1 major elective

1 year of Physics - Major Electives

1 year of Organic Chemistry - Major Electives

Biochemistry – Major Electives

PSY 105 & 106 – NEU major requirement

SOC 101 – SSMW Learning Domain

*For students interested in going to medical school, it is highly recommended to meet with Pre-Health Advisor, Lindsey Burdick. Please visit the following webpage to register for Pre-Health Advising, and to access other Pre-Health resources: https://csh.depaul.edu/student-resources/advising-student-services/pre-health-advising/Pages/default.aspx.

Students Applying to Graduate School in Neuroscience:

Requirements for graduate school in neuroscience differ significantly. All general prerequisites for graduate school have been included in either the required or elective courses for the major. However, students who want to go to graduate school are advised to meet with a Neuroscience faculty advisor early to make appropriate elective choices within their concentration. More information about graduate programs can be found on our website:

https://csh.depaul.edu/academics/neuroscience/student-resources/Pages/Graduate-Programs.aspx

Students in the Honors Program:

Students admitted to DePaul as part of the Honors Program can major in any of the concentrations. Instead of the LSP requirements the students will take an equal amount of courses (17) in the Honors Program. Please continue to work with your assigned advisor in the Honors program in addition to one in Neuroscience. The courses are:

HON 100: Rhetoric and Critical Inquiry

HON 101: World Literature

HON 102: History in Global Contexts

HON 104: Religious Worldviews and Ethical Perspectives

HON 105: Philosophical Inquiry

HON 110 or 111: Discover or Explore Chicago

HON 201: States, Markets, and Societies

HON 205: Interdisciplinary Arts

HON 208: Sociocultural Inquiry

HON 301: Honors Junior Seminar in Multiculturalism HON 350 or 351 or 395: Honors Senior Capstone

1 Fine Arts Elective

3 Language Courses (intermediate and above)

3 Honors Approved Electives (NEU/PHL 228 Neuroethics and NEU390 Capstone, if taken can count as 2) Experiential Learning Verification.

2020-21 Course Offerings by Quarter – Please note that these <u>may change</u> over the year. Use "Class Search" in Campus Connect to confirm course offerings: https://csh.depaul.edu/academics/neuroscience/Pages/class-search.aspx

Field	Fall Quarter	Winter Quarter	Spring Quarter
NEU	201- Intro. to Neuroscience 301- Neuroscience Research Methods	201- Intro. to Neuroscience 228- Neuroethics 339- Cellular Neurobiology 380- Special Topics in Neuroscience 390- Neuroscience Capstone	201- Intro. to Neuroscience 301- Neuroscience Research Methods 380- Special Topics 390- Neuroscience Capstone
віо	191- General Biology I 193- General Biology III 206- Biostatistics 307- Animal Physiology 250- Cell Biology 380- Cancer Biology 339- Cell Neurobiology 342- Cognitive Neuroscience	191- General Biology I 192- General Biology II 206- Biostatistics 220- Prin. Of Biotechnology 250- Cell Biology 260- Genetics 340- Behavioral Neuroscience 360- Molecular Biology	192- General Biology II 193- General Biology III 201- Human Anatomy 206- Biostatistics 250- Cell Biology 260- Genetics 308- Human Physiology 342- Cognitive Neuroscience 386- Intro. To Endocrinology
PSY	105- Intro. To Psychology I 106- Intro. To Psychology II 240- Statistics I 241- Research Methods I 242- Research Methods II 333- Child Psychology 353- Abnormal Psychology 360- Theories of Learning/Cog. 373- Happiness, Judgement	105- Intro. To Psychology I 106- Intro. To Psychology II 240- Statistics I 242- Research Methods II 333- Child Psychology	105- Intro. To Psychology I 106- Intro. To Psychology II 240- Statistics I 242- Research Methods II 317- Psych. Of Interpersonal Rel. 333- Child Psychology
СНЕ	130/131- General Chem. I 134/135- General Chem. III 230/231- Organic Chem. I 234/235- Organic Chem. III 340/341- Biochemistry I	130/131- General Chem. I 132/133- General Chem. II 230/231- Organic Chem. I 232/233- Organic Chem. II 340/341- Biochemistry I 342/343- Biochemistry II	132/133- General Chem. II 134/135- General Chem. III 228/229- Survey Of Organic 232/233- Organic Chem. II 234/235- Organic Chem. III

CDM	IT 240- Intro. To Databases IT 223- Statistics/Data Analysis CSC 241- Computer Science I CSC 242- Computer Science II DSC 324- Data Analysis and Statistical Software II DSC 341- Data Science CSC 381- Image Processing MAT 150,151,152- Calc. I,II,III	IT 240- Intro. To Databases IT 223-Statistics/Data Analysis CSC 241- Computer Science I CSC 242- Computer Science II CSC 324- Data Analysis and Statistical Software II MAT 150,151,152- Calc. I,II,III	IT 240- Intro. To Databases IT 223- Statistics/Data Analysis CSC 241- Computer Science I CSC 242- Computer Science II CSC 324- Data Analysis and Statistical Software CSC 367- Data Mining MAT 150,151,152- Calc. I,II,III
нстн	140- Medical Terminology 201- Intro to Health Science 210- Intro to Public Health 301- Integrated Human Anatomy/Physiology A	201- Intro to Health Science 210- Intro to Public Health 301- Integrated Human Anatomy/Physiology A 302- Integrated Human Anatomy/Physiology B	201- Intro to Health Science 210- Intro to Public Health 302- Integrated Human Anatomy/Physiology B

OTHER IMPORTANT INFORMATION:

Class Standing:

Freshman: 0-43 credit hours
Sophomores: 44-87 credit hours
Juniors: 88-131 credit hours
Seniors: 132 credit hours or more

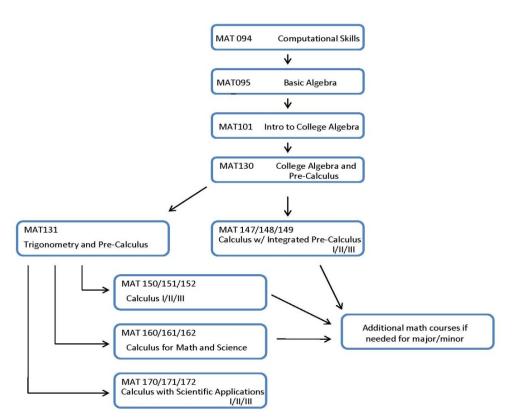
Degree Conferral:

- o Complete a minimum of 192 quarter hours.
- o Earn a minimum of 2.000 cumulative GPA.
- o Satisfy all the regulations of the individual college or school granting the degree.
- Earn grades of C- or better in all major, minor and allied field classes (GPA greater than or equal to 2.000).
- Complete the residency requirement: final 60 quarter hours of credit; one-half of credit earned in the major concentration; one-half of credit earned in the minor if applicable; all courses in senior year.
- Complete the online degree conferral application in Campus Connection by the designated deadline date.

Math Placement:

Below is a math path that is useful in determining your math placement. Since MAT130 or MAT131 is the prerequisite for BIO191 and CHE130, it is considered the minimum math requirement for the Neuroscience degree. Computational Concentration students will require some additional math (see the concentration requirements above).

Take any one of the following math sequences to fulfill the math sequence for the neuroscience degree:



Math 147/148/149 — Calculus with integrated pre-calculus. Math 131 is not needed before taking this sequence. MAT 147 only offered in Fall; MAT 148 only offered in Winter; MAT 149 only offered in Spring. Note: some graduate programs will not take this sequence as the calculus pre-requisite.

Math 150/151/152 – Standard calculus. MAT 150/151/152 are each offered every quarter

Math 160/161/162 – Calculus for math and science majors. A longer lab section with more mathematical application MAT 160 only offered in Fall; MAT 161 only offered in Winter; MAT 162 only offered in Spring.

ath 170/171/172 – Calculus with scientific application. Course content will use more science examples. Designed for students majoring in physical or life sciences. Heavier focus on differential equations. MAT 170 only offered in Fall; MAT 171 only offered in Winter; MAT 172 only offered in Spring.

Getting Started

Declaring or Changing Your Major, Minor, or Concentration: You can officially register or change your intended major, minor, or concentration in Campus Connect. This can be done by the following method: *Campus Connect > Academic Records > Change College, Major, Minor, or Concentration*

Registering & Wait list Procedures: Follow this link for video tutorials on your Degree Progress and Registering for classes. (http://offices.depaul.edu/depaul-central/registration/Pages/default.aspx) Also, please understand waitlists are automatic within our system. If you are on the waitlist for a class, you will need to wait until the appropriate amount of people drop from the class to which then our system will automatically add you to the class from the waitlist. There is little to nothing your advisor or the professor can do to get you into a class you are waitlisted for, especially lab based classes. This is due to space and safety issues.

Pre-Health Advising: Interested in a health related career? There are many forms of Pre-Health Advising at DePaul. There is the Pre-health Advisory Committee (PAC), which is comprised of an interdisciplinary body of faculty and staff whose primary function is the academic advising of students intending to pursue a career in one of the health professions. We also have a dedicated Pre-Health staff advisor in addition to the Biology staff advisor. To learn more about the PAC and our Pre-Health Advisor, and to obtain information about upcoming events and speakers that the PAC organizes, we encourage you to visit their website and register for their services at: http://csh.depaul.edu/student-resources/advising-student-services/pre-health-advising

Getting Involved

Student Groups: DePaul has a vast amount of student organizations for students wishing to get involved. There are many science-based organizations and clubs available. Please visit the Student Involvement website by logging in through OrgSync: http://www.orgsync.com/ to join and to learn more about all of the student organizations. Here are a few:

- DePaul Neuroscience Club
- Nu Rho Psi Neuroscience Honor Society
- Psi Chi Psychology Honor Society
- Chemistry Club of DePaul
- Society of Physics Students
- o DePaul Mathematics Club
- Pre-Health Advising Committee Student Organization (PACSO)
- o Under-Represented Groups in Medicine
- o Life Science and Pre-med Club
- Computer Science Society
- o Psychology Peer Mentors
- o DePaul oSTEM

Senior Year Career Checklist

- 1. Revamp your resume. Review and update your resume, cover letter, and portfolio.
- 2. Improve your profile. Strengthen your personal brand by updating your LinkedIn account and using its tools to expand and organize your network. You can start by joining the Virtual Networking Lounge.
- 3. Connect over coffee. Get an insider's perspective on a job or industry and learn about your field by setting up an informational interview.
- 4. Practice interviewing. Practice your interviewing skills from the comfort of your couch with DePaul Interview Stream.
- 5. Research and apply. Put your Googling skills to work. Research your ideal employers, types of jobs and positions in your field. Over 1000 new jobs and internships are posted each month in DePaul Experience.
- 6. Questions? Contact the Career Center.

Transfer Students

Students transferring to DePaul from other Colleges and Universities, either within the same field or a different field or major, should see an academic advisor as soon as possible in order to ensure that your credits match up to get you on track for degree completion.

As this is still a fairly new program, we expect many students to be transferring from another major. Keep in mind that depending on previous coursework and level of science background completed it might take longer to complete the intended degree.

AP Credit

All freshmen and transfer students who have taken an Advanced Placement (AP) test will be awarded DePaul course credit in the amounts indicated below provided that official score reports are submitted to the Office of Admission prior to enrolling at DePaul.

For information regarding other exams not listed follow this link http://www.depaul.edu/admission-and-aid/test-credit-and-placement/credit-given-by-exam/Pages/ap.aspx or contact the Transfer Articulation Center at TrAC@depaul.edu.

Subject	AP Exam Name	Score	Course Credit	Course Awarded
AP Capstone	Research/Seminar Course	4 or 5	4	LSP 112
Biology	Biology	3 4 5	4 8 12	BIO 191 BIO 191 & 192 BIO 191, 192 & 193

Chemistry	Chemistry	3 4 5	4 4 8	CHE 102 CHE 130 & 131 CHE 130/131 & CHE 132/133
Computer Science	Computer Science A	3 4 5	4 4 8	IT 130 CSC 243 CSC 241 & 242
Mathematics	Calculus AB Calculus BC Statistics	3 4 or 5 3, 4 or 5 3, 4 or 5	4 8 12 4	MAT 135 or 150 MAT 150 & 151 or 135 & 136 MAT 150-152 or 135 & 136 & one SI MAT 242 or SOC 279
Physics	Physics B Physics C Part 1 Physics C Part 2 Physics 1 Physics 2	4 or 5 4 or 5 5 4 or 5 4 or 5	12 4 8 4 4	PHY 150, 151 & 152 PHY 170 PHY 171 & 172 PHY 150 PHY 152
Psychology	Psychology	4 or 5	8	PSY 105 & 106

Many professional school programs do not accept AP credit for science courses. Students who are considering applying to professional programs (e.g. medical, dental, pharmacy, optometry, etc.) are encouraged to take science courses at DePaul.

What to do after receiving a B.S. in Neuroscience

By achieving a Bachelor of Science in Neuroscience, our students will be prepared to pursue a variety of career paths that include options such as:

- Within the health field, students can go on to graduate training programs that focus on neuroimaging and neurophysiology for example, administering electroencephalograms or magnetic resonance imaging.
- Professional health careers dealing with Neuroscience include Psychiatry, Neurology, Neuropathology, Neuro-physics, and Neurosurgery.
- Students interested in Psychology can pursue careers in counseling, clinical psychology, or neuropsychology.
- Students in computational neuroscience can go on to graduate programs in computer science, imaging, artificial intelligence, and "big data."
- Another option is to move on to graduate programs in marketing and economics as Neuromarketing and Neuro-economics are fairly new fields, or in law and ethics.
- Upon completion of a B.S. in Neuroscience, without pursuit of graduate studies, students will be qualified for numerous positions as biomedical, pharmaceutical, and psychology researchers, forensics technicians, science writers, data analysis, or non-for-profit agencies dealing with disease and disorder of the brain.

For additional about careers in Neuroscience visit:

https://csh.depaul.edu/academics/neuroscience/student-resources/Pages/Career-Resources.aspx

Email Etiquette

(1) Send email at appropriate time of day between 9am-5pm M-F

From: Student

Sent: Monday, April 18, 2016 12:25 PM (1)

To: Thomas, Matt

Cc:

(2) Have a clear applicable subject line

Bcc:

Subject: Advising Meeting (2)

Dear Professor (3) Thomas,

(3) Always make sure you're addressing properly (4) Use a nice greeting

(5) Identify who you are

Hope this message finds you well. (4) My name is Shannon (5), and I am a sophomore neuroscience major at DePaul. I am wondering if you would have time this week to meet with me to discuss courses (6) for next fall quarter. I am available after 1:00pm Monday through Friday this week. Whenever is most convenient for you (7) during that time, would work for me.

Let me know what time would be best, or if I can provide any further information. Thank you in

advance. I look forward to hearing from you! (8)

(8) Include a sincere goodbye (7) Include availability

(6) Identify why you are writing to them

Student's full name Student's contact info (9)

> (9) Make sure signatures are concise and include contact info

Final Checks

Is the email concise? Are there any spelling or grammatical errors? Is the information included relevant? Am I using the appropriate tone?

Avoid bold, underline, all capitals, but 'please' and 'thank you' go a long way!

Key Elements of a Successful Resume

Header: Your header must include all contact information, such as: First and last name, phone number, email address, street address, city, state, and zip code

Objective: An objective aims to state your purpose in creating and submitting your resume, namely the position you are seeking. This section is optional and could be omitted to save space or substituted with a "Career Highlights" or "Summary of Qualifications" section. If you do include an objective statement, it is recommended that you be very specific with your goals and that you aim to preview your top qualities, proven skills, and knowledge.

Education: Your education section should include the institution and its location (city, state), degree, and (expected) graduation date. Include the full name of your expected degree along with any minors or concentrations. It is recommended that you include your GPA, but only if it is higher than a 3.0/4.0. Other possible information you might add to this section includes study abroad experiences, relevant coursework, or academic awards and honors.

Experience: Options include one large experience section (with positions listed in reverse chronological order) or multiple sections titled to highlight more relevant experience by placing it towards the top of your resume (e.g. "Relevant Experience," "Health Related Experience," or "Research Experience, followed by "Additional Experience").

Headers for each position should include job title, employer, location (city, state), and the date range of employment (months and years or by season). Following your header, describe the skills and knowledge you demonstrated in each position using well developed accomplishment statements.

Quick tips for quality accomplishment statements:

- Emphasize transferable and technical skills and knowledge by way of concrete examples of when you applied them.
- Start with a strong action verb, and then follow with an explanation of what you did, describe how you did it, and, when possible, include any outcomes that were achieved. Be specific by including quantity, frequency, population, and impact of your work whenever possible. Vary your action verbs throughout the resume.
- Accomplishment statements should be in the proper tense (past or present tense) and use correct grammar and punctuation.

Consider the following questions to help you create more effective accomplishment statements:

- What were your accomplishments?
- How does this experience relate to your internship/employment goal?
- How did you help the organization?
- What skills/knowledge did you enhance?
- What was the result/outcome of your work?

Additional Skills: In this section include only skills that are testable and concrete. Soft skills such as communication, organizational, and interpersonal skills should not be listed here, but rather incorporated into your bulleted accomplishment statements above. Be sure to qualify your level of proficiency for each skill.

You might consider using subsections here such as:

Laboratory Skills: Include skills, familiarity with equipment and processes/procedures, and knowledge relevant to the laboratory setting. Examples include Distillation, Extraction, and Chromatography etc.

Technology: Focus on programs and proficiency levels that would not be assumed based on education and include your proficiency level. For example: Advanced user of Microsoft Office Suite, including Outlook, Excel, and PowerPoint, as well as Adobe Photoshop; Beginner user of SPSS.

Languages: For example: Fluent in oral and written German; Beginner knowledge of Spanish.

DePaul's Career Center Resume Resources

The Career Center offers several options for getting help in creating and perfecting your resume. Take advantage of one or more of the following services available to students and alumni:

- Peer Career Advising: Peer Career Advisors have been specially trained to provide resume
 assistance and basic career services to the DePaul community. Peers are available on a walk-in
 basis during most business hours or via email at peercareeradvisor@depaul.edu for questions, job
 search advice, resume assistance, and cover letter critiques.
- o **Online Tutorial and Resources:** Visit the Career Center's website at www.careercenter.depaul.edu to access an interactive resume tutorial, Instant Message a Peer Career Advisor, or access this packet and other documents electronically.
- Career Advising: Career Advisors, who specialize in serving the needs of students and alumni
 from each of DePaul's colleges, are available to meet by appointment. Advising sessions can cover
 a variety of topics, including selecting a major, advanced resume development, job search
 strategies, interviewing skills, and other career-related concerns.

Contact the Career Center to schedule an appointment with a Career Advisor or inquire about Peer Career Advisor Availability.

Lincoln Park Campus 2320 N Kenmore Ave, SAC 192 Chicago IL, 60614 (773)-325-7431 Loop Campus 1 E. Jackson Blvd, Suite 9500 Chicago IL, 60604 (312)-362-8437

Research in Neuroscience:

Research Opportunities at DePaul: Faculty within the College of Science and Health department often have positions available for undergraduates seeking research experience. We encourage students to contact faculty and explore the opportunity for research here at DePaul:

Visit our website and read through faculty profiles to see the current research projects of our faculty members: https://csh.depaul.edu/academics/neuroscience/research/Pages/default.aspx

Visit the College of Science and Health Research website for college sponsored internships and other information: http://go.depaul.edu/cshstudentresearch.

Handshake is our online hub for all things college to career - jobs, internships, career fairs, events, mentors and more. Goal in mind: to help connect students to their dream career. https://depaul.joinhandshake.com/.

Research at Rosalind Franklin: https://rosalindfranklin.edu/academics/chicago-medical-school/departments/neuroscience/

"The mission of the Department of Neuroscience is to conduct high quality research and to educate medical and graduate students at Rosalind Franklin University of Medicine and Science regarding molecular, cellular, and clinical aspects of central nervous system function."

DePaul/Rosalind Franklin University of Medicine and Science Summer Research Program: DePaul and RFUMS offer a paid summer biomedical sciences research program for undergraduates on the Rosalind Franklin campus in North Chicago. In this program you are matched with a faculty member at RFUMS and assist in various research areas, including neuroscience. For questions see the college website: http://go.depaul.edu/cshstudentresearch . The application deadline is typically in January for the following year.

Study Abroad and Internships in Neuroscience for Undergrads:

Resources to help you find study abroad and internship opportunities in Neuroscience can be found at: https://csh.depaul.edu/academics/neuroscience/student-resources/Pages/Internships-and-Study-Abroad.aspx

INTERESTING NEUROSCIENCE RESOURCES:

The BRAIN Initiative: http://www.braininitiative.nih.gov/

"The Brain Research through Advancing Innovative Neurotechnologies® (BRAIN) Initiative is part of a new Presidential focus aimed at revolutionizing our understanding of the human brain. By accelerating the development and application of innovative technologies, researchers will be able to

produce a revolutionary new dynamic picture of the brain that, for the first time, shows how individual cells and complex neural circuits interact in both time and space. Long desired by researchers seeking new ways to treat, cure, and even prevent brain disorders, this picture will fill major gaps in our current knowledge and provide unprecedented opportunities for exploring exactly how the brain enables the human body to record, process, utilize, store, and retrieve vast quantities of information, all at the speed of thought."

The Human Brain Project: https://www.humanbrainproject.eu/

"The Human Brain Project (HBP) is a European Commission Future and Emerging Technologies Flagship. The HBP aims to put in place a cutting-edge, ICT-based scientific research infrastructure that will allow scientific and industrial researchers to advance our knowledge in the fields of neuroscience, computing and brain-related medicine. The Project promotes collaboration across the globe, and is committed to driving forward European industry."

Emory University's Program: http://compneurosci.college.emory.edu/index.html

"The Emory University – Georgia Institute of Technology training program in Computational Neuroscience, "From Cells to Systems and Applications," selects graduate and undergraduate students admitted to one of the existing programs in Biology, Neuroscience, or Biomedical Engineering and obtain a 2 year stipend to complete a specialization in Computational Neuroscience with a focus on biologically applied questions. Lab rotations facilitate the choice of a thesis advisor, and an interactive format of Methods Clinics, Journal Clubs, and an Annual Program Retreat engender an atmosphere of personal interactions and mentorship."

Neurological Sciences Programs: http://www.ninds.nih.gov/funding/training-career-awards/summer-internships

"The National Institute of Neurological Disorders and Stroke's Summer Program in the Neurological Sciences is a student research training program in brain and nervous system research. The Summer Program in the Neurological Sciences offers a unique opportunity for academically talented high school, undergraduate, graduate, and medical students to receive first-rate training in neuroscience research. Students get hands-on experience working with leading scientists in the Institute's Division of Intramural Research, the "in-house" research component of the NINDS. NINDS Labs are located in Bethesda, Rockville and Cape Cod, Massachusetts."

NINDS also has mechanisms in place to support students in combined MD-PhD or other dual-doctoral degree training programs, as well as for PhD students. They will only consider applications designed to support the training and development of scientists with interests relevant to the mission of NINDS. Check out the link for more information. http://www.ninds.nih.gov/Funding/Training-Career-Development/Predoctoral-Fellows

Allen Brain Atlas: www.brain-map.org

"The Allen Institute for Brain Science, founded in 2003 by philanthropist Paul G. Allen, is dedicated to understanding how the human brain works in health and disease. As part of a 10-year plan launched in March 2012 to understand the neural code—how activity in the brain's cortex leads to perception, decision making, and ultimately action—the Allen Institute has created a set of large-scale programs to understand the fundamentals of the cortex. We will be focusing our understanding through simultaneous study of the brain's components, computation, and cognition."

Local Neuroscience Organizations:

Society for Neuroscience: https://www.sfn.org/

Society for Neuroscience Chicago Chapter: http://chicagosfn.org/ Cognitive Neuroscience Society: https://www.cogneurosociety.org/

Additional Resources

Student Success:

Students interested in locating tutoring, mentoring, advising, and study help should check out the Student Success Website. https://resources.depaul.edu/student-success/Pages/default.aspx

Is Neuroscience right for you:

Students who are unsure about a Major in Neuroscience can check out this link from the College Board website to get further insight on the vast amount of research and career opportunities! https://bigfuture.collegeboard.org/majors/biological-biomedical-sciences-neuroscience.

Next Steps for Incoming Students:

Now that you've been admitted, there are important steps that you need to take before you start your first quarter. Check out DePaul's website to select your student type (Freshman, Transfer/Adult, International) and follow the checklist. http://www.depaul.edu/admission-and-aid/Pages/default.aspx.

Social Media

We use social media platforms to help inform our students about potential internships and research opportunities, upcoming events in the department, and other departmental news and information.



https://twitter.com/DePaulNeuro



https://www.facebook.com/depaulneuro/



https://instagram.com/depaulneuro