Department of Psychology

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Erik Thiessen, Director of Undergraduate Education in Psychology
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www.cmu.edu/dietrich/psychology

Can newborn infants perceive the world as we do, or is it just a "blooming buzzing confusion"? Do personality, beliefs and social factors influence health? How do scientists and young children make discoveries, and what abilities make these insights possible? How does brain activity reveal differences in thinking? Can computers think the way people do?

These are some of the questions that psychologists at Carnegie Mellon are trying to answer.

For the student who is majoring in Psychology, Cognitive Science or Neuroscience, studying with faculty who are on the leading edge of research on questions like the above can be a very exciting experience.

The Psychology Department at Carnegie Mellon has long been noted as one of the pioneering Psychology Departments in the world, particularly in such areas as cognitive psychology, cognitive science, social psychology, developmental psychology, cognitive neuroscience, and health psychology. The Psychology Department offers 5 majors: B.A. and B.S. degrees in Psychology, as well as a B.S. degree in Cognitive Science and together with the Department of Biological Sciences, a unified B.S. double major in Psychology and Biological Sciences, and an Intercollege major in Neuroscience.

Statement of Community Standards

The Department of Psychology at Carnegie Mellon University strives to be a community that is academically and intellectually rigorous, as well as being diverse, inclusive, and respectful to all of its members. We aspire to promote a collegial environment of free exchange of ideas amongst individuals.

They embark and champion the following values:

- Excellence in the workplace requires an environment that promotes courtesy and civility towards every community member. Courtesy and civility require having mutual respect for one another. Therefore we expect all members of our community to take individual responsibility for:
  - Viewing threats, hate speech, and harassment as totally unacceptable in an environment of free exchange of ideas amongst individuals.
  - Encouraging all individuals to be respectful of others’ views and opinions when expressing their own.
  - Communicating with each other in ways that are clear, relevant, timely, constructive, and respectful.
  - Making efforts to welcome and get to know all members of our community.
  - Taking care of our common spaces rather than assuming that others will do it for us.

Diversity and Inclusion in Our Community

Academic excellence is built on a thriving and diverse community – something that is not possible without respectful treatment of all community members and intentional elimination of barriers to inclusion across groups. Therefore we expect all members of our community to take individual responsibility for:

- Providing mentoring and support for our colleagues.
- Prioritizing recruitment of people from diverse backgrounds into our community.
- Making efforts to be aware of the barriers faced by individuals and, whenever possible, making accommodations to remove or mitigate these barriers.
- Recognizing that with greater power within the academic hierarchy comes greater accountability for our actions and interactions.
- Making efforts to include our colleagues in intellectual and social gatherings during the workday whenever possible and appropriate.

The Major in Psychology

Psychology is a discipline that embraces both biological and social sciences. It is a science concerned with establishing principles and laws regarding the ways in which people think and behave through the scientific study of human behavior.

The orientation of the Carnegie Mellon Psychology curriculum is toward developing highly skilled and knowledgeable graduates. About half of our graduates go on to graduate or professional school. The remainder seek to expand their problem-oriented analytic skills to qualify themselves for job opportunities beyond those typically open to liberal arts students. Using the outcomes tool (https://www.cmu.edu/career/outcomes/post-grad-dashboard.html) created by CMU's Career & Professional Development Center, students have the opportunity to explore where some of our recent graduates have accepted employment and their positions.

Majors in the department are expected not only to learn about findings already established by psychologists, but also to become proficient in the investigation and analysis of behavior. This includes observing behavior, formulating hypotheses, designing experiments to test these hypotheses, running experiments, performing statistical analysis, and writing reports. The department has many resources for students to use in acquiring these skills. For instance, students interested in child development may be involved in the child development laboratory and observational facilities which are a part of the Carnegie Mellon Children’s School (www.cmu.edu/dietrich/psychology/cs/) which operates under the department's aegis. Students interested in health or clinical psychology might have opportunities to do internships in applied settings, and all Psychology majors have access to extensive computer facilities for data analysis and simulation work. The department also has a state of the art set of undergraduate research laboratories and computer clusters, and through the Scientific Imaging & Brain Research Center, a magnet is in use for conducting brain imaging studies using fMRI.

In addition to formal class work, students are encouraged to participate in research projects where they may register and receive credit for freshmen research experience coursework. Psychology 198 Research Training: Psychology, 85-508 Reading in Psychology, Fall research experience in 85-507 Research in Psychology or Spring research experience in 85-508 Research in Psychology. In the research psychology course, the faculty member may work on an ongoing research projects or develop and carry out a new research project with a faculty member. To compliment students research experience, the department requires 85-509 Research in Psychology Practicum, a 1 unit, pass/fail course which provides students with an opportunity to frame their research experience in a broader professional and colleagues.

There is university and departmental funding (https://www.cmu.edu/dietrich/psychology/undergraduate/current-students/research-and-internships/research-opportunities/). More information on research labs that are recruiting can be found here (https://www.cmu.edu/dietrich/psychology/undergraduate/current-students/research-and-internships/research-opportunities/).

In addition to formal class work, students are encouraged to participate in research projects where they may register and receive credit for freshmen research experience coursework. Psychology 198 Research Training: Psychology, 85-508 Reading in Psychology, Fall research experience in 85-507 Research in Psychology or Spring research experience in 85-508 Research in Psychology. In the research psychology course, the faculty member and student meet to discuss the readings, and the student writes a paper on the topic selected. The Psychology Department Website (http://www.cmu.edu/dietrich/psychology/), provides descriptions of faculty research interests (http://www.cmu.edu/dietrich/psychology/research-areas/) that the student can use in determining who should be approached to supervise a particular research or reading project.

Students interested in gaining field work experience via a number of internship opportunities available to them can receive credit through 85-482 Internship in Psychology, 85-480 Internship in Clinical Psychology or 85-484 Practicum in Child Development. Clinical internships are available with a variety of clinical settings including the prestigious Western Psychiatric Institute (https://www.upmc.com/locations/locations/westernpsychiatric/?gclid=awds.2507p0g1&utm_source=GOOGLE&utm_medium=cpc&utm_campaign=western +psychiatric&utm_advertisersid=70000001754524&gclid=EAIaQobCcMLI-Hgx6n8r8VdzfSxZ_ChJF-AEAYAASAAEgKopr even though we have not yet determined what course work we can award credit for.

If you would like to learn more about the BA and BS in Psychology, please reach out to Crista Crittenden (crittenden@andrew.cmu.edu) for more information.

Bachelor of Arts in Psychology

Mathematics

10-20 units

21-111-21-112 Calculus I-II 20

or

21-120 Differential and Integral Calculus + 10

*Students who place out of 21-120 with AP credit will have successfully completed the calculus requirement

Carnegie Mellon Children's School

www.cmu.edu/dietrich/psychology/cs/
Statistics Sequence 9 units
36-309 Experimental Design for Behavioral & Social Sciences 9
or 85-309 Statistical Concepts and Methods for Behavioral and Social Science

Psychology Surveys 27 units
85-102 Introduction to Psychology * 9

Survey Courses - Complete Two Units
85-104 Psychopathology 9
85-211 Cognitive Psychology 9
or 85-213 Human Information Processing and Artificial Intelligence 9
85-219 Foundations of Brain and Behavior 9
85-221 Principles of Child Development 9
85-241 Social Psychology 9
85-251 Personality 9

* Introduction to Psychology cannot be substituted; AP credit does not count towards this requirement

Research Methods 18 units
Complete two courses.
85-310 Research Methods in Cognitive Psychology 9
85-314 Cognitive Neuroscience Research Methods 9
85-320 Research Methods in Developmental Psychology 9
85-330 Analytic Research Methods 9
85-340 Research Methods in Social Psychology 9

Advanced Courses 18 units
Advanced psychology courses exist within four areas (cognitive, cognitive neuroscience, development, and social and health psychology.) Any advanced content course or seminar in psychology or any psychology course higher than 85-349. Exceptions for the advanced course requirement are: 85-480, 85-482, 85-484, 85-506, 85-507, 85-508, 85-601, 85-602, 66-501, 66-502.

Psychology Breadth, Depth, and Application Electives 27 units
Three courses from at least two of the Breadth, Depth and Application Categories. Please consult the psychology department undergraduate website for approved Breadth Electives.

Depth
Any Psychology course between 85-300-85-499.

Application
85-198 Research Training: Psychology 9
85-294 Teaching Assistantship Var.
85-480 Internship in Clinical Psychology Var.
85-482 Internship in Psychology Var.
85-484 Practicum in Child Development Var.
85-507 Research in Psychology Var.
85-508 Research in Psychology Var.
85-601 Senior Thesis 9
85-602 Senior Thesis 9
66-501 Dietrich College Senior Honors Thesis I 9
66-502 Dietrich College Senior Honors Thesis II Must receive a B or higher, 9 units min 9
99-270 Summer Undergraduate Research Apprenticeship 9

Breadth
Any 200 level Psychology survey course.
85-104 Psychopathology 9
85-105 Hack Your Life 9
85-106 Animal Minds 9
85-107 The Psychology of Video Games 9

or
Choose from a list of courses found outside of the department with departments including Biological Sciences, History, English, HCI, Philosophy, Social Decision Sciences and Statistics. The elective list may change and for the most up to date list please contact either Crista Crittenden ccritten@andrew.cmu.edu or Emilie O'Leary at emilier@andrew.cmu.edu.

Computer Science Requirement
15-110 Principles of Computing 10
or 88-300 Programming and Data Analysis for Social Scientists
or 15-112 Fundamentals of Programming and Computer Science

Natural Science Requirement (B.A. 18 units of which include 9 units of Gen Ed Science)
The B.A. in psychology requires one course beyond the General Education requirement in natural science.
These courses can be selected from the following areas:
• 03-XXX Biology*
• 09-XXX Chemistry
• 33-XXX Physics
* Given the growing relevance of biology to psychology, it is strongly recommended to take a course in Biological Sciences

Bachelor of Science in Psychology
Mathematics 10-20 units
21-111-21-112 Calculus I-II 20
or
21-120 Differential and Integral Calculus * 10

*Students who place out of 21-120 with AP credit will have successfully completed the calculus requirement

Statistics Sequence 9 units
36-309 Experimental Design for Behavioral & Social Sciences 9
or 85-309 Statistical Concepts and Methods for Behavioral and Social Science

Psychology Surveys 27 units
85-102 Introduction to Psychology * 9

Survey Courses - Complete Two Units
85-104 Psychopathology 9
85-211 Cognitive Psychology 9
or 85-213 Human Information Processing and Artificial Intelligence 9
85-219 Foundations of Brain and Behavior 9
85-221 Principles of Child Development 9
85-241 Social Psychology 9
85-251 Personality 9

* Introduction to Psychology cannot be substituted; AP credit does not count towards this requirement

Research Methods 18 units
Complete two courses.
85-310 Research Methods in Cognitive Psychology 9
85-314 Cognitive Neuroscience Research Methods 9
85-320 Research Methods in Developmental Psychology 9
85-330 Analytic Research Methods 9
85-340 Research Methods in Social Psychology 9

Advanced Courses 18 units
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Psychology Breadth, Depth, and Application Electives 27 units
Three courses from at least two of the Breadth, Depth and Application Categories. Please consult the psychology department undergraduate website for approved Breadth Electives.

Depth
Any Psychology course between 85-300-85-499.

Application
85-198 Research Training: Psychology 9
85-294 Teaching Assistantship Var.
85-480 Internship in Clinical Psychology Var.
85-482 Internship in Psychology Var.
85-484 Practicum in Child Development Var.
85-507 Research in Psychology Var.
85-508 Research in Psychology Var.
85-601 Senior Thesis 9
85-602 Senior Thesis 9
66-501 Dietrich College Senior Honors Thesis I 9
66-502 Dietrich College Senior Honors Thesis II Must receive a B or higher, 9 units min 9
99-270 Summer Undergraduate Research Apprenticeship 9

Breadth
Any 200 level Psychology survey course.
85-104 Psychopathology 9
85-105 Hack Your Life 9
85-106 Animal Minds 9
85-107 The Psychology of Video Games 9

or
Choose from a list of courses found outside of the department with departments including Biological Sciences, History, English, HCI, Philosophy, Social Decision Sciences and Statistics. The elective list may change and for the most up to date list please contact either Crista Crittenden ccritten@andrew.cmu.edu or Emilie O'Leary at emilier@andrew.cmu.edu.
In order to complete an additional major in Psychology, a student must fulfill all of the Psychology major requirements within the department -- in other words, the breadth requirement, computing requirement, three survey courses, two research methods courses, and two advanced courses. These courses must include at least 81 units, plus calculus prerequisites and the 36-200 statistics course or equivalent and 36-309/85-309. In addition, psychology additional major candidates must complete one science course beyond the GenEd requirement if required for college.

Concentrations within the Psychology Major

Students who wish to focus their Psychology program on a specific area can do so either by the careful selection of Psychology elective courses focusing on their area of interest or by pursuing one of the following concentrations. Concentrations are not a required part of the major.

Please reach out to Crista Crittenden ccrittenden@andrew.cmu.edu to declare the concentration. The declared concentration will appear in Stellic. The completion of a concentration will be recognized in the Psychology Graduation Program.

Health-Psychology Concentration

For Psychology majors who wish to have a focus of their study on Health Psychology, the following courses should be selected as part of their Psychology Major in conjunction with their Psychology advisor's approval.

As part of the natural science requirement, choose two of the following
03-121 Modern Biology 9
03-132 Basic Science to Modern Medicine 9

03-133 Neurobiology of Disease 9
03-135 Structure and Function of the Human Body 9

As part of the psychology breadth requirement:
85-219 Foundations of Brain and Behavior 9
85-241 Social Psychology 9

As part of the psychology Research Methods requirements:
85-340 Research Methods in Social Psychology 9

As part of the advanced coursework in psychology requirement, at least two of the following:
85-358 Pro-Social Behavior 9
85-422 Clinical Psychology: Science and Practice 9
85-442 Health Psychology 9
85-443 Social Factors and Well-Being 9
85-446 Psychology of Gender 9

As part of the Breadth, Depth and Application requirement, at least one of the following:
85-480 Internship in Clinical Psychology 9
85-507 Research in Psychology 9
85-508 Research in Psychology 9
85-482 Internship in Psychology 9

or an additional advanced psychology seminar from the list above

Cognitive-Neuroscience Concentration

For Psychology majors who wish to have a focus of their study be on Cognitive Neuroscience, the following courses should be selected as part of their Psychology Major in conjunction with their Psychology advisor's approval.

As part of the natural science requirement, choose two of the following
03-121 Modern Biology 9
03-363 Systems Neuroscience 9
03-366 Neuropsychology: Drugs, Brain and Behavior 9

As part of the psychology breadth requirement:
85-211 Cognitive Psychology 9
85-219 Foundations of Brain and Behavior 9

As part of the Research Methods requirement:
85-310 Research Methods in Cognitive Psychology 9
85-314 Cognitive Neuroscience Research Methods 9

As part of the advanced coursework in psychology requirement, at least two of the following:
85-351 What is Attention? 9
85-356 Expertise: The cognitive (neuro)science of mastering almost any skill 9
85-359 Introduction to Music Cognition Research 9
85-370 Perception 9
85-382 The Psychology and Neuroscience of Consciousness 9
85-385 Auditory Perception: Sense of Sound 9
85-407 How the Brain Makes Meaning 9
85-408 Visual Cognition 9
85-414 Cognitive Neuropsychology 9
85-419 Introduction to Parallel Distributed Processing 9
85-432 Data Science for Psychology and Neuroscience 9
85-435 Biologically Intelligent Exploration 9

As part of the Breadth, Depth and Application requirement, at least one of the following:
85-507 Research in Psychology 9
85-508 Research in Psychology Var.
88-342 The Neuroscience of Decision Making 9

Or an additional advanced psychology seminar from the list above

Learning and Developmental Psychology Concentration

For Psychology majors who wish to have a focus of their study be on Behavior and Developmental Psychology, the following courses should be selected as part of their Psychology Major in conjunction with their Psychology advisor's approval.

As part of the B.S. science requirement, choose one of the following
03-125 Evolution 9
As part of the psychology Breadth requirement:
- 85-422 Research in Psychology

As part of the psychology Research Methods requirement:
- 85-385 Designing Human Centered Software
- 85-413 Human Factors

As part of the Psychology Research Methods requirements at least one of the following:

As part of the advanced coursework in psychology requirement, at least one of the following:
- 85-482 Internship in Psychology
- 05-320 Social Web

As part of the psychology Breadth requirement at least two of the following:
- 03-133 Neurobiology of Disease
- 03-366 Neuropsychology: Drugs, Brain and Behavior
- 09-303 Hooked: The Molecular Basis of Addiction

As part of the Psychology Breadth requirement at least two of the following:
- 85-221 Principles of Child Development
- 85-241 Social Psychology
- 85-251 Personality

As part of the advanced coursework in psychology requirement, at least two of the following:
- 85-434 Psychology of Prejudice
- 85-435 Social Factors and Well-Being
- 85-444 Relationships
- 85-446 Psychology of Gender

Or an additional advanced psychology seminar from the list above

Cognitive Psychology Concentration
For Psychology majors who wish to have a focus of their study be on Cognitive Psychology and/or Cognitive Modeling, the following courses should be selected as part of their Psychology Major in conjunction with their Psychology advisor's approval.

As part of the B.S. science requirement: Units
- 03-121 Modern Biology 9
- 03-365 Neural Correlates of Learning and Memory 9
- 85-211 Cognitive Psychology 9
- 85-221 Principles of Child Development 9
- 85-310 Research Methods in Cognitive Psychology 9
- 85-320 Research Methods in Developmental Psychology 9

As part of the advanced coursework in psychology requirement, at least two of the following:
- 85-343 Children, Race, and Racism 9
- 85-351 What is Attention? 9
- 85-360 Origins of Intelligence 9
- 85-361 Attention, Its Development and Disorders 9
- 85-362 Origins of Intelligence 9
- 85-363 Attention, Its Development and Disorders 9
- 85-375 Crosscultural Psychology 9
- 85-394 Development in Context: Applying Theory and Research to Support Thriving 9
- 85-407 How the Brain Makes Meaning 9
- 85-408 Visual Cognition 9
- 85-418 Infant development: Inside the mind of babies 9
- 85-422 Research in Psychology 9

As part of the Breadth, Depth and Application requirement, at least two of the following:
- 85-407 How the Brain Makes Meaning 9
- 85-408 Visual Cognition 9
- 85-412 Cognitive Modeling 9
- 85-414 Cognitive Neuropsychology 9
- 85-419 Introduction to Parallel Distributed Processing 9
- 85-421 Language and Thought 9
- 85-435 Biologically Intelligent Exploration 9

As part of the Psychology Research Methods requirements at least one of the following:
- 85-320 Research Methods in Developmental Psychology 9

As part of the advanced coursework in psychology requirement, at least two of the following:
- 85-343 Children, Race, and Racism 9
- 85-358 Pro-Social Behavior 9
- 85-363 Attention, Its Development and Disorders 9

Or an additional advanced psychology seminar from the list above

Clinical/Counseling Psychology Concentration
For Psychology majors who wish to have a focus of their study be on Clinical Counseling Psychology, the following courses should be selected as part of their Psychology Major in conjunction with their Psychology advisor's approval.

As part of the B.S. science requirement: Units
- 03-121 Modern Biology 9
- 03-365 Neural Correlates of Learning and Memory 9
- 85-211 Cognitive Psychology 9
- 85-221 Principles of Child Development 9
- 85-310 Research Methods in Cognitive Psychology 9
- 85-320 Research Methods in Developmental Psychology 9

As part of the Psychology Breadth requirement:
- 85-358 Pro-Social Behavior 9
- 85-359 Introduction to Music Cognition Research 9
- 85-361 Attention, Its Development and Disorders 9
- 85-375 Crosscultural Psychology 9
- 85-377 Attitudes and Persuasion 9
- 85-422 Research in Psychology 9
- 85-433 Social Factors and Well-Being 9
- 85-444 Relationships 9
- 85-446 Psychology of Gender 9
- 85-482 Internship in Psychology 9

As part of the Psychology Research Methods requirements at least one of the following:
- 85-385 Designing Human Centered Software 12
- 85-413 Human Factors 9
- 85-419 Introduction to Parallel Distributed Processing 9
- 85-421 Language and Thought 9
- 85-435 Biologically Intelligent Exploration 9

As part of the advanced coursework in psychology requirement, at least two of the following:
- 85-343 Children, Race, and Racism 9
- 85-358 Pro-Social Behavior 9
- 85-363 Attention, Its Development and Disorders 9

As part of the Breadth, Depth and Application requirement, at least two of the following:
- 85-407 How the Brain Makes Meaning 9
- 85-408 Visual Cognition 9
- 85-412 Cognitive Modeling 9
- 85-414 Cognitive Neuropsychology 9
- 85-419 Introduction to Parallel Distributed Processing 9
- 85-421 Language and Thought 9
- 85-435 Biologically Intelligent Exploration 9

As part of the Psychology Research Methods requirements at least one of the following:
- 85-320 Research Methods in Developmental Psychology 9

As part of the advanced coursework in psychology requirement, at least two of the following:
- 85-343 Children, Race, and Racism 9
- 85-358 Pro-Social Behavior 9
- 85-363 Attention, Its Development and Disorders 9
85-375 Crosscultural Psychology 9
85-377 Attitudes and Persuasion 9
85-442 Health Psychology 9
85-443 Social Factors and Well-Being 9
85-444 Relationships 9
85-446 Psychology of Gender 9

**Neuroscience Major**

The Psychology Department at Carnegie Mellon University has a major focus on the role of the brain and nervous system in cognition and behavior, including biological approaches involving the health impact that arises from the interaction of behavior with the nervous, endocrine, and immune systems. These interests are manifested in faculty research (http://www.cmu.edu/dietrich/psychology/research-areas/), departmental and university centers that operate from or heavily involve the department (e.g., the Center for Cognitive Brain Imaging (http://www.ccbi.cmu.edu/), and the Center for the Neural Basis of Cognition (http://www.cnsb.cmu.edu/)) as well as undergraduate coursework (http://www.cmu.edu/dietrich/psychology/) and graduate coursework.

For undergraduates, there are a number of ways in which students with an interest in these approaches can pursue that interest in an organized fashion. Major requirements for the Bachelor of Science in Neuroscience can be found under Intercollege Programs (http://coursecatalog.web.cmu.edu/intercollegeprograms/#bachelorofscienceneurosciencetext).

Carnegie Mellon University recently launched BrainHub – an initiative designed to leverage its core strengths in cognitive science, engineering, and computer science, and our emerging excellence in biological sciences, to harness the technology that helps the world explore brain and behavior. Students will be able to take advantage of exciting opportunities such as lectures hosted on various topics, newly funded CMU campus research projects trying to answer pressing questions in brain science and the many global partnerships with other institutions all with the same motivating goal to enhance and increase research in brain sciences.

Finally, for any interested student, there is a Minor in Cognitive Neuroscience (p. 7) available through the Psychology department.

**The Major in Cognitive Science**

The Psychology Department offers a B.S. degree in Cognitive Science. The field of cognitive science has grown out of increasingly active interaction among psychology, linguistics, artificial intelligence, philosophy, and neuroscience. All of these fields share the goal of understanding intelligence. By combining these diverse perspectives, students of cognitive science are able to understand cognition at a deep level. Because this major is administered by the Psychology Department, it focuses on human cognition and the experimental study of the human mind as illuminated by the techniques of the above disciplines.

**Cognitive Science Curriculum**

The Cognitive Science major is only offered as a B.S. degree. Candidates should complete before the junior year the calculus requirement 21-120 (or alternatively 21-111/21-112) and a statistics sequence (36-200 or equivalent and if possible, 36-309/85-309 ). In addition, candidates complete 15-112 Fundamentals of Programming and Computer Science, as their departmental computing course.

Because of the number and sequential nature of required courses, prospective Cognitive Science majors are encouraged to begin course work for the major prior to junior year. In particular, completion of calculus, 36-200, and 85-211 or 85-213 before the junior year will enable students to complete one of the following 85-310/85-314/85-330/85-350 and 36-309/85-309 and by the Fall semester of their sophomore or junior year and, if interested, to then take advantage of research opportunities in the department. The Psychology Department (https://www.cmu.edu/dietrich/psychology/undergraduate/current-students/research-and-internships/ research-opportunities/) website has more information regarding research for credit opportunities available to undergraduates.

**Computing Prerequisite**

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**Mathematics**

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**Statistics Sequence** 18 units

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<td>36-200</td>
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**Computational/Cognitive Modeling Core** 29–31 units

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**Cognitive Psychology Core** 27 units

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**Cognitive Science Concentration**

(3 courses, concentration approval required)

These three courses are chosen in conjunction with your advisor to form a coherent area of concentration from the course list under "Cognitive Science Concentration" in the current Undergraduate Catalog. Before proceeding with the choice of courses, students must fill out the concentration form, obtained from Emilie O’Leary in Baker Hall 339, with a description of the concentration area and the planned set of three courses. Courses not represented on the list may, with pre-approval of advisor and department, be used to satisfy part of this requirement. The three courses are not required to be within any single category below but be coherent within the major and the focus may vary across disciplinary boundaries. Courses taken for the major requirements can not be double counted in the concentration.

**Computer Science**

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>16-385</td>
<td>12</td>
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<tr>
<td>15-453</td>
<td>9</td>
</tr>
<tr>
<td>15-213</td>
<td>12</td>
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</table>

**Psychology**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>85-219</td>
<td>9</td>
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<tr>
<td>85-354</td>
<td>9</td>
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<tr>
<td>85-360</td>
<td>9</td>
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<tr>
<td>85-363</td>
<td>9</td>
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</tbody>
</table>

*Students who place out of 21-120 will have fulfilled the calculus requirement.

Statistics Sequence 18 units

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>36-200</td>
<td>9</td>
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<tr>
<td>36-309</td>
<td>9</td>
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<tr>
<td>or 85-309</td>
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Mandatory Core Courses

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<th>Course</th>
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<td>15-122</td>
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<td>15-150</td>
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<td>15-251</td>
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<td>85-419</td>
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<td>85-435</td>
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<td>85-211</td>
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<td>85-213</td>
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Elective Requirements

<table>
<thead>
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<th>Course</th>
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<td>85-351</td>
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<td>85-375</td>
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<tr>
<td>85-382</td>
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<td>85-407</td>
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<td>85-408</td>
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<td>85-414</td>
<td>9</td>
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<td>85-421</td>
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<td>80-381</td>
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<td>80-383</td>
<td>9</td>
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<tr>
<td>05-413</td>
<td>9</td>
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<tr>
<td>11-344</td>
<td>12</td>
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</table>

**Department of Psychology**
Degree Requirements:

<table>
<thead>
<tr>
<th>Biological Sciences</th>
<th>03-151</th>
<th>Honors Modern Biology</th>
<th>10</th>
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<tbody>
<tr>
<td>or 03-121</td>
<td>Modern Biology</td>
<td>10</td>
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<tr>
<td>03-220</td>
<td>Genetics</td>
<td>9</td>
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<tr>
<td>or 03-221</td>
<td>Genomes, Evolution, and Disease: Introduction to Quantitative Genetic Analysis</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>03-231</td>
<td>Honors Biochemistry</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>03-320</td>
<td>Cell Biology</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>03-343</td>
<td>Experimental Techniques in Molecular Biology</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>03-411</td>
<td>Topics in Research</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>03-412</td>
<td>Topics in Research</td>
<td>1</td>
<td></td>
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<tr>
<td>03-xxx</td>
<td>General Biology Elective</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>
Additional Laboratory or Research Methods

Additional Advanced Elective 1

Total Biology units 78

1 Please see description and requirements for electives under the B.S. in Biological Sciences section of this Catalog.

Mathematics, Statistics, Physics and Computer Science Units
21-120 Differential and Integral Calculus 10
21-124 Calculus II for Biologists and Chemists 10
or 21-122 Integration and Approximation
36-200 Reasoning with Data 9
36-309 Experimental Design for Behavioral & Social Sciences 9
or 85-309 Statistical Concepts and Methods for Behavioral and Social Science
33-121 Physics I for Science Students 2
or 33-141 Physics I for Engineering Students
15-110 Principles of Computing 10-12
or 15-112 Fundamentals of Programming and Computer Science
99-101 Computing @ Carnegie Mellon 3

Total Science units 63-65

2 MCS students must also complete 33-122 Physics II for Biological Sciences & Chemistry Students.

Chemistry Units
09-105 Introduction to Modern Chemistry I 10
09-106 Modern Chemistry II 10
09-217 Organic Chemistry I 9
09-218 Organic Chemistry II 9
09-207 Techniques in Quantitative Analysis 9
09-208 Techniques in Organic Synthesis and Analysis 9

Total Chemistry units 56

Psychology Courses Units
85-102 Introduction to Psychology 9
85-219 Foundations of Brain and Behavior 9
85-2xx Survey Psychology Courses 18
85-310 Research Methods in Cognitive Psychology 9
or 85-314 Cognitive Neuroscience Research Methods
or 85-320 Research Methods in Developmental Psychology
or 85-330 Analytic Research Methods
or 85-340 Research Methods in Social Psychology
85-3xx Advanced Psychology Electives 18

Total Psychology units 63

* Excluding 85-261 Psychopathology

Additional Advanced Elective 9 units

(Choose one of the following courses)
85-3xx Advanced Psychology Elective 9
or
03-3xx Advanced Biology Elective 9

Additional Laboratory or Research Methods 9-12 units

(Choose one of the following courses)
03-344 Experimental Biochemistry 12
03-345 Experimental Cell and Developmental Biology 12
03-346 Experimental Neuroscience 12
85-310 Research Methods in Cognitive Psychology 9
85-314 Cognitive Neuroscience Research Methods 9
85-320 Research Methods in Developmental Psychology 9
85-330 Analytic Research Methods 9
85-340 Research Methods in Social Psychology 9

Elective Units Units
Free Electives 33-36
MCS Non-Technical Breadth or DC General Education requirements 36-48

Total Elective units 69-84

Minimum number of units required for degree: 360

Minors in Psychology and Cognitive Neuroscience

Minor in Psychology 72 units

I. Introductory course
85-102 Introduction to Psychology 9

*A survey course can be taken in place of 85-102.

II. Area Survey courses
Complete one course
85-104 Psychopathology 9
85-211 Cognitive Psychology 9
or 85-213 Human Information Processing and Artificial Intelligence
85-219 Foundations of Brain and Behavior 9
85-221 Principles of Child Development 9
85-241 Social Psychology 9
85-251 Personality 9

III. Statistics
36-200 Reasoning with Data 9
36-309 Experimental Design for Behavioral & Social Sciences 9
or 85-309 Statistical Concepts and Methods for Behavioral and Social Science

27 units Upper Level Courses

Complete three courses from categories IV and V, with at least one course from each.

IV. Research Methods Courses * (minimum 9 units)
85-310 Research Methods in Cognitive Psychology 9
85-314 Cognitive Neuroscience Research Methods 9
85-320 Research Methods in Developmental Psychology 9
85-330 Analytic Research Methods 9
85-340 Research Methods in Social Psychology 9

* Prerequisites for all Research Methods courses: 36-309/85-309 and the appropriate survey course.

V. Advanced courses (minimum 9 units)


Psychology Elective - Anything with 85-XXX number can be used 9 units

Minor in Cognitive Neuroscience 63 units

The minor in Cognitive Neuroscience offered by the Department of Psychology is similar to the Neuroscience Minor offered by the Department of Biological Sciences.

The differences between the two forms of the minor are determined by one required course, and additionally, by the students' choice of distribution electives.

The requirements for the Cognitive Neuroscience Minor include 7 courses: four required courses, and three distribution and elective courses.

Because of the curriculum within this minor may overlap with some degree requirements, no more than 2 courses fulfilling Neuroscience or Cognitive Neuroscience Minor requirements may count towards a student's major or other minor requirements.
Cognitive Neuroscience Curriculum

Required Coursework

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>03-121</td>
<td>Modern Biology</td>
<td>9</td>
</tr>
<tr>
<td>03-363</td>
<td>Systems Neuroscience</td>
<td>9</td>
</tr>
<tr>
<td>85-219</td>
<td>Foundations of Brain and Behavior</td>
<td>9</td>
</tr>
<tr>
<td>or 03-161</td>
<td>Molecules to Mind</td>
<td>9</td>
</tr>
<tr>
<td>85-211</td>
<td>Cognitive Psychology</td>
<td>9</td>
</tr>
</tbody>
</table>

Distribution Requirements

Three courses, including at least 1 from each of the following categories

Approaches to Cognitive Neuroscience

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>85-213</td>
<td>Human Information Processing and Artificial Intelligence</td>
<td>9</td>
</tr>
<tr>
<td>85-314</td>
<td>Cognitive Neuroscience Research Methods</td>
<td>9</td>
</tr>
<tr>
<td>85-382</td>
<td>The Psychology and Neuroscience of Consciousness</td>
<td>9</td>
</tr>
<tr>
<td>85-407</td>
<td>How the Brain Makes Meaning</td>
<td>9</td>
</tr>
<tr>
<td>85-408</td>
<td>Visual Cognition</td>
<td>9</td>
</tr>
<tr>
<td>85-412</td>
<td>Cognitive Modeling</td>
<td>9</td>
</tr>
<tr>
<td>85-414</td>
<td>Cognitive Neuropsychology</td>
<td>9</td>
</tr>
<tr>
<td>85-419</td>
<td>Introduction to Parallel Distributed Processing</td>
<td>9</td>
</tr>
<tr>
<td>85-435</td>
<td>Biologically Intelligent Exploration</td>
<td>9</td>
</tr>
<tr>
<td>15-386</td>
<td>Neural Computation</td>
<td>9</td>
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<tr>
<td>86-375</td>
<td>Computational Perception</td>
<td>9</td>
</tr>
<tr>
<td>85-432</td>
<td>Data Science for Psychology and Neuroscience</td>
<td>9</td>
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</tbody>
</table>

Cognitive Neuroscience Electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>03-133</td>
<td>Neurobiology of Disease</td>
<td>9</td>
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<tr>
<td>03-362</td>
<td>Cellular Neuroscience</td>
<td>9</td>
</tr>
<tr>
<td>03-365</td>
<td>Neural Correlates of Learning and Memory</td>
<td>9</td>
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<tr>
<td>85-211</td>
<td>Cognitive Psychology</td>
<td>9</td>
</tr>
<tr>
<td>85-359</td>
<td>Introduction to Music Cognition Research</td>
<td>9</td>
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<tr>
<td>85-360</td>
<td>Origins of Intelligence</td>
<td>9</td>
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<tr>
<td>85-370</td>
<td>Perception</td>
<td>9</td>
</tr>
<tr>
<td>85-385</td>
<td>Auditory Perception: Sense of Sound</td>
<td>9</td>
</tr>
<tr>
<td>85-351</td>
<td>What is Attention?</td>
<td>9</td>
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<tr>
<td>85-106</td>
<td>Animal Minds</td>
<td>9</td>
</tr>
<tr>
<td>85-104</td>
<td>Psychopathology</td>
<td>9</td>
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</tbody>
</table>

The Honors Program

The Honors Program provides recognition of outstanding performance by students in the Psychology department. Participation enables students to pursue their own research ideas through completion of an honors thesis. The honors thesis is completed during the senior year. By completing a thesis, the student earns 18 units of credit and qualifies for graduation with “College Honors.” To qualify for the Honors Program, the student must maintain a quality point average of at least 3.50 in the major and 3.25 overall. More information on the Honor program can be found here (http://www.cm.edu/dietrich/undergraduate/programs/shp/).

A year long departmental senior thesis course exists (66.501 and 66.502) for students interested in pursuing a sizable research project who do not qualify for the honors program. More information can be obtained by contacting Emilie O’Leary at emilier@andrew.cmu.edu.

Faculty

JOHN R. ANDERSON, Richard King Mellon University Professor of Psychology and Computer Science – Ph.D., Stanford University; Carnegie Mellon, 1978–

JESSICA CANTLON, Ronald J. and Mary Ann Zdrojewski Associate Professor of Developmental Neuroscience – Ph.D., Duke University; Carnegie Mellon, 2007–

SHARON CARVER, Teaching Professor, Psychology; Associate Dean of Student Affairs, Dietrich College – Ph.D., Carnegie Mellon University; Carnegie Mellon, 1993–

CHANTE COX-BOYD, Associate Teaching Professor – Ph.D., University of North Carolina at Chapel Hill; Carnegie Mellon, 1999–

DAVID CRESWELL, Professor – Ph.D., University of California, Los Angeles; Carnegie Mellon, 2008–

KASEY CRESWELL, Associate Professor – Ph.D., University of Pittsburgh; Carnegie Mellon, 2012–

BROOKE C. FEENEY, Professor – Ph.D., State University of New York at Buffalo; Carnegie Mellon, 2001–

ANNA FISHER, Associate Professor – Ph.D., The Ohio State University; Carnegie Mellon, 2006–

VICKI S. HELGESON, Professor – Ph.D., University of Denver; Carnegie Mellon, 1990–

LAURIE HELLER, Teaching Professor – Ph.D., University of Pennsylvania; Carnegie Mellon, 2009–

MARCEL A. JUST, D. O. Hebb University Professor of Psychology – Ph.D., Stanford University; Carnegie Mellon, 1972–

ROBERTA KLATZKY, Charles J. Queenan Jr., University Professor of Psychology – Ph.D., Stanford University; Carnegie Mellon, 1993–

KENNETH R. KOEDINGER, Hillman Professor & METALS Program Director – Ph.D., Carnegie Mellon University; Carnegie Mellon, 2001–

PHOEBE LAM, Assistant Professor – Ph.D, Northwestern University; Carnegie Mellon, 2023–

MARSHA C. LOVETT, Teaching Professor – Ph.D., Carnegie Mellon University; Carnegie Mellon, 2000–

BRIAN MACWHINNEY, Teresa Heinz Professor of Cognitive Psych – Ph.D., University of California, Berkeley; Carnegie Mellon, 1981–

BRADFORD MAHON, Associate Professor – PhD, Harvard University; Carnegie Mellon, 2009–

KODY MANKE, Assistant Teaching Professor – Ph.D, Standford University; Carnegie Mellon, 2016–

DAVID PLAUT, Professor of Psychology – Ph.D., Carnegie Mellon University; Carnegie Mellon, 1994–

DAVID RAKISON, Associate Professor – D.Phil., University of Sussex; Carnegie Mellon, 2000–

MICHAEL TARR, Professor & Dept Head and Kav#i#-Moura Professor of Cognitive and Brain Science – Ph.D., Massachusetts Institute of Technology; Carnegie Mellon, 2009–

ERIK D. THIESSEN, Associate Professor, Director of Undergraduate Education in Psychology – Ph.D., University of Wisconsin, Madison; Carnegie Mellon, 2004–

MICHAEL TRUJILLO, Assistant Professor – PhD, Virginia Commonwealth University; Carnegie Mellon, 2018–

TIMOTHY VERSTYNE, Associate Professor and Co Director of the CMU-Pitt BRIDGE Center – Ph.D., University of California, Berkeley; Carnegie Mellon, 2006–