Department of Psychology

Michael Tarr, Department Head
Erik Thiessen, Director of Undergraduate Education in Psychology
Chante Cox-Boyd, Associate Director of Undergraduate Education in Psychology
Emilie O’Leary, Academic Advisor in Psychology
Crista Crittenden, Academic Advisor in Psychology

www.cmu.edu/dietrich/psychology (http://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 professional environment in which all individuals can thrive and do their best work with community support and free from harassment, intimidation, or disrespect. We embrace and champion the following values:

Courteous and Respect for Individuals

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/postgrad-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 (https://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 used 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 course 85-198 Research Training. Psychology, 85-506 Readings in Psychology, Fall research experience in 85-507 Research in Psychology or Spring research experience in 85-508 Research in Psychology. In the psychology course, the student may work on an ongoing research project 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 scholastic perspective. 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/).

There is university and departmental funding (https://www.cmu.edu/dietrich/psychology/undergraduate/current-students/research-and-internships/undergrad-research-grants.html) available to help support student-initiated research projects and student travel to present research results at scientific meetings and conferences. In the Readings courses, the student reads extensively on a particular topic. 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/hospitals/western-psychiatric/?gclid=aw.ds&gclid=sw25spgG0utm_source=GOOGLE&utm_medium=cpc&+western+psychiatric) which operates under the hospital’s auspices. The program operates under the auspices of Carnegie Mellon University and is affiliated with the Department of Psychiatry at the University of Pittsburgh Medical School. During the internship, students gain first-hand experience with different clinical populations. Developmental Practicum experience is available in the department-run CMU Children’s School (http://www.cmu.edu/dietrich/psychology/centers-and-facilities/).
If you would like to learn more about the BA and BS in Psychology, please reach out to Crista Crittenden ccritten@andrew.cmu.edu for more information.

**Bachelor of Arts in Psychology**

<table>
<thead>
<tr>
<th>Mathematics</th>
<th>10-20 units</th>
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<tbody>
<tr>
<td>21-111-21-112 Calculus I-II</td>
<td>20</td>
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</table>
| 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*

<table>
<thead>
<tr>
<th>Statistics Sequence</th>
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<tbody>
<tr>
<td>36-309 Experimental Design for Behavioral &amp; Social Sciences</td>
<td>9</td>
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<thead>
<tr>
<th>Psychology Surveys</th>
<th>27 units</th>
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</table>
| 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 | |
| 85-219 Biological Foundations of 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*

<table>
<thead>
<tr>
<th>Research Methods</th>
<th>18 units</th>
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<tbody>
<tr>
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<tr>
<td>85-310 Research Methods in Cognitive Psychology</td>
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<tr>
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<tr>
<td>85-294 Teaching Assistantship</td>
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<td>66-501 Dietrich College Senior Honors Thesis I</td>
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| 66-502 Dietrich College Senior Honors Thesis II | Must receive a B or higher; 9 units min |
| 99-270 Summer Undergraduate Research Apprentice | 9 |

<table>
<thead>
<tr>
<th>Breadth</th>
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<tbody>
<tr>
<td>Any 200 level Psychology survey course.</td>
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<tr>
<td>85-104 Psychopathology</td>
<td>9</td>
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<tr>
<td>85-105 Hack Your Life</td>
<td>9</td>
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<tr>
<td>85-106 Animal Minds</td>
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<td>85-107 The Psychology of Video Games</td>
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<td>15-110 Principles of Computing</td>
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</tr>
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<td>or 88-300 Programming and Data Analysis for Social Scientists</td>
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<th>Natural Science Requirement (B.A. 18 units of which include 9 units of Gen Ed Science)</th>
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<tr>
<td>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:</td>
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<tr>
<td>• 03-XXX Biology</td>
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*Given the growing relevance of biology to psychology, it is strongly recommended to take a course in Biological Sciences*

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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 .

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85-320 Research Methods in Developmental Psychology 9
85-330 Analytic Research Methods 9
85-340 Research Methods in Social Psychology 9

Advanced Courses 27 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

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

Breadth
Any 200 level psychology survey course.
85-104 Psychopathology 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 ccrittenden@andrew.cmu.edu or Emilie O’Leary at emilier@andrew.cmu.edu

Computer Science Requirement 10 units
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.S. 27 UNITS OF WHICH INCLUDE 9 UNITS OF GEN ED SCIENCE)
The B.S. in psychology requires two courses beyond the General Education requirement in natural science.

• 03-xxx Biology*
• 09-xxx Chemistry
• 33-xxx Physics
* Given the growing relevance of biology to psychology, it is strongly recommended to take at least one course in Biological Sciences

Additional Major in Psychology
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 Biological Foundations of Behavior 9
85-241 Social Psychology 9

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

As an advanced psychology course 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 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 Neuroparmacology: Drugs, Brain and Behavior 9

As part of the psychology Breadth requirement:
85-211 Cognitive Psychology 9
85-219 Biological Foundations of 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 an advanced psychology course 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
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:  
03-121 Modern Biology 9

As part of the psychology Breadth requirement:  
85-211 Cognitive Psychology 9

As part of the psychology Research Methods requirement:  
85-310 Research Methods in Cognitive Psychology 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
85-360 Origins of Intelligence 9
85-363 Attention, Its Development and Disorders 9
85-370 Perception 9
85-385 Auditory Perception: Sense of Sound 9
85-395 Applications of Cognitive Science 9
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 Breadth, Depth and Application requirement, at least one of the following:  
85-507 Research in Psychology 9
85-508 Research in Psychology 9
88-342 The Neuroscience of Decision Making 9

As part of the psychology Research Methods requirement:  
85-241 \( x \) 9
85-104 Psychopathology 9

As part of the psychology Breadth requirement:  
03-121 Evolution 9
03-121 Modern Biology 9
03-364 Developmental Neuroscience 9
03-365 Neural Correlates of Learning and Memory 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
85-354 Infant Language Development 9
85-360 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

As part of the Breadth, Depth and Application requirement, at least two of the following:  
85-294 Teaching Assistantship 9
85-484 Practicum in Child Development 9
85-507 Research in Psychology 9
85-508 Research in Psychology 9
76-420 The Cognition of Reading and Writing: Introduction to a Social/Cognitive Process 9
05-291 Learning Media Design 12
05-418 Design Educational Games 12
57-331 Principles of Education 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 9
85-482 Internship in Psychology 9
05-320 Social Web 12

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:  
Units
03-125 Evolution 9
03-121 Modern Biology 9
03-364 Developmental Neuroscience 9
03-365 Neural Correlates of Learning and Memory 9

As part of the psychology Breadth requirement:  
85-211 Cognitive Psychology 9
85-221 Principles of Child Development 9

As part of the psychology Research Methods Requirement:  
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
85-354 Infant Language Development 9
85-360 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

As part of the Breadth, Depth and Application requirement, at least two of the following:  
85-294 Teaching Assistantship 9
85-484 Practicum in Child Development 9
85-507 Research in Psychology 9
85-508 Research in Psychology 9
76-420 The Cognition of Reading and Writing: Introduction to a Social/Cognitive Process 9
05-291 Learning Media Design 12
05-418 Design Educational Games 12
57-331 Principles of Education 9

Or an additional advanced psychology seminar from the list above

Social-Personality Psychology Concentration

For Psychology majors who wish to have a focus of their study be on Social and/or Personality 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 psychology Breadth requirement:  
Units
85-104 Psychopathology 9
85-241 Social Psychology 9
85-251 Personality 9

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

As part of the advanced coursework in psychology requirement, at least two of the following:  
85-350 Psychology of Prejudice 9
85-358 Pro-Social Behavior 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

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 9
85-482 Internship in Psychology 9
05-320 Social Web 12

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

As part of the psychology Breadth requirement:  
85-211 Cognitive Psychology 9

As part of the psychology Research Methods requirement:  
85-310 Research Methods in Cognitive Psychology 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
85-360 Origins of Intelligence 9
85-363 Attention, Its Development and Disorders 9
85-370 Perception 9
85-385 Auditory Perception: Sense of Sound 9
85-395 Applications of Cognitive Science 9
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 Breadth, Depth and Application requirement, at least one of the following:  
85-507 Research in Psychology 9
85-508 Research in Psychology 9
88-342 The Neuroscience of Decision Making 9

As part of the psychology Research Methods requirement:  
85-241 \( x \) 9
85-104 Psychopathology 9

As part of the psychology Breadth requirement:  
03-125 Evolution 9
03-121 Modern Biology 9
03-364 Developmental Neuroscience 9
03-365 Neural Correlates of Learning and Memory 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
85-354 Infant Language Development 9
85-360 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

As part of the Breadth, Depth and Application requirement, at least two of the following:  
85-294 Teaching Assistantship 9
85-484 Practicum in Child Development 9
85-507 Research in Psychology 9
85-508 Research in Psychology 9
76-420 The Cognition of Reading and Writing: Introduction to a Social/Cognitive Process 9
05-291 Learning Media Design 12
05-418 Design Educational Games 12
57-331 Principles of Education 9

Or an additional advanced psychology seminar from the list above
Neuroscience

global partnerships with other institutions all with the same motivating goal

lectures hosted on various topics, newly funded CMU campus research

Students will be able to take advantage of exciting opportunities such as
designed to leverage its core strengths in cognitive science, engineering,
#bachelorofscienceinneurosciencetext

Programs

of Science in Neuroscience can be found under

with an interest in these approaches can pursue that interest
undergraduate/

Center for the Neural Basis of Cognition

the

university centers that operate from or heavily involve the department (e.g.,

www.cmu.edu/dietrich/psychology/research-areas/

systems. These interests are manifested in

from the interaction of behavior with the nervous, endocrine, and immune

The Psychology Department at Carnegie Mellon University has a major
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/)) as well as
undergraduate coursework (http://www.cm.edu/dietrich/psychology/
undergraduate/) 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://coursescatalog.web.cmu.edu/intercollegeprograms/
bachelorofscienceinneurosciencetext).

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.

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.

One of the following:

03-133 Neurobiology of Disease 9
03-366 Neuropharmacology: Drugs, Brain and Behavior 9
09-303 Hooked: The Molecular Basis of Addiction 6

As part of the Psychology Breadth requirement at least two of

85-221 Principles of Child Development 9
85-241 Social Psychology 9
85-251 Personality 9

Required coursework:

85-104 Psychopathology 9
85-422 Clinical Psychology: Science and Practice 9
85-480 Internship in Clinical Psychology 9

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

85-320 Research Methods in Developmental Psychology 9
85-340 Research Methods in Social 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

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undergraduate coursework (http://www.cm.edu/dietrich/psychology/
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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 85-310/85-314/85-330and 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
15-112 Fundamentals of Programming and Computer Science 10 units
Mathematics
21-111-21-112 Calculus I-II 29-30 units
or
21-120 Differential and Integral Calculus + 20 units
21-127 Concepts of Mathematics 10 units

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

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

Computational/Cognitive Modeling Core
21 units
29-31 units

Two of the following:
15-122 Principles of Imperative Computation 10 units
15-150 Principles of Functional Programming 10 units
15-251 Great Ideas in Theoretical Computer Science 12 units

Plus one of the following:
Units
85-412 Cognitive Modeling 9 units
85-419 Introduction to Parallel Distributed Processing 9 units
85-435 Biologically Intelligent Exploration 9 units

Cognitive Psychology Core
27 units
85-211 Cognitive Psychology 9 units
or 85-213 Human Information Processing and Artificial Intelligence 9 units

Plus two of the following, one of which need to be 85-xxx:
85-219 Biological Foundations of Behavior 9 units
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 Emile 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

16-385  Computer Vision  12
15-453  Formal Languages, Automata, and Computability  9
15-213  Introduction to Computer Systems  12

Psychology

85-219  Biological Foundations of Behavior  9
85-354  Infant Language Development  9
85-360  Origins of Intelligence  9
85-363  Attention, Its Development and Disorders  9
85-370  Perception  9
85-375  Crosscultural Psychology  9
85-385  Auditory Perception: Sense of Sound  9
85-395  Applications of Cognitive Science  9
85-406  Autism: Psychological and Neuroscience Perspectives  9
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
85-382  The Psychology and Neuroscience of Consciousness  9
85-408  Visual Cognition  9
85-407  How the Brain Makes Meaning  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
85-423  Cognitive Development  9
85-426  Learning in Humans and Machines  9
85-429  Cognitive Brain Imaging  9
85-432  Data Science for Psychology and Neuroscience  9

Philosophy

80-210  Logic and Proofs  9
80-211  Logic and Mathematical Inquiry  9
80-220  Philosophy of Science  9
80-249  AI, Society, and Humanity  9
80-254  Analytic Philosophy  9
80-255  Pragmatism  9
80-270  Problems of Mind and Body: Meaning and Doing  9
80-271  Mind and Body: The Objective and the Subjective  9
80-310  Formal Logic  9
80-311  Undecidability and Incompleteness  9
80-314  Causal Discovery, Statistics, and Machine Learning  9

Human Computer Interaction

05-317  Design of Artificial Intelligence Products  12
05-320  Social Web  12
05-333  Gadgets, Sensors and Activity Recognition in HCI  12
05-823  E-Learning Design Principles and Methods  12
05-433  Programming Usable Interfaces OR Software Structures for Usable Interfaces  6
05-418  Design Educational Games  12
05-413  Human Factors  9
05-410  User-Centered Research and Evaluation  12

Linguistics

80-180  Nature of Language  9
80-280  Linguistic Analysis  9
80-315  Modal Logic  9
76-385  Introduction to Discourse Analysis  9

Machine Learning

10-301  Introduction to Machine Learning (Undergrad)  12
10-335  Art and Machine Learning  12
10-315  Introduction to Machine Learning (SCS Majors)  12
10-405  Machine Learning with Large Datasets (Undergraduate)  12
11-344  Machine Learning in Practice  12
11-411  Natural Language Processing  12

Decision Sciences

88-275  Bubbles: Data Science for Human Minds  9
88-302  Behavioral Decision Making  9
88-380  Dynamic Decisions  9
88-388  Psychological Models of Decision Making  9
88-231  Thinking in Person vs. Thinking Online  9
88-230  Human Intelligence and Human Stupidity  9
88-223  Decision Analysis  12
88-120  Reason, Passion and Cognition  9

Neurosciences

03-133  Neurobiology of Disease  9
03-365  Neural Correlates of Learning and Memory  9
03-366  Neuropharmacology: Drugs, Brain and Behavior  9
03-370  Principles of Biotechnology  9
86-375  Computational Perception  9
03-362  Cellular Neuroscience  9
03-363  Systems Neuroscience  9
42-202  Physiology  9
15-386  Neural Computation  9
15-883  Computational Models of Neural Systems  12
Science Requirement
The Cognitive Science program requires two additional science courses beyond the college's one course Science General Education requirement.

These can be selected from any one of the following areas.

- 03-xxx Biology
- 09-xxx Chemistry
- 33-xxx Physics

* Those interested in a cognitive neuroscience focus are recommended to take biology courses, including if possible, 03-362, or 03-363.

Additional Major in Cognitive Science
In order to complete a double major in Cognitive Science, a student must fulfill the major requirements as listed under the Cognitive Science major. These include the programming requirement (15-112), the Mathematics and Statistics prerequisites, Computational/Cognitive Modeling Core, The Cognitive Psychology Core, the Cognitive Science Concentration Requirement, and the Supplementary Science Requirement. Students will be assigned a department advisor to help plan their program of studies in Cognitive Science.

Unified Double Major in Psychology & Biological Sciences
Veronica Hinman, Department Head, Biological Sciences
Michael Tarr, Department Head, Psychology

This major is intended to reflect the interdisciplinary nature of current research in the fields of biology and psychology, as well as the national trend in some professions to seek individuals broadly trained in both the social and natural sciences.

Note: Students entering from the Dietrich College of Humanities and Social Sciences will earn a Bachelor of Science in Psychology and Biological Sciences. Students in the Mellon College of Science will earn a Bachelor of Science in Biological Sciences and Psychology, Depending on a student’s home college (DC or MCS), General Education (GenEd) requirements will be different. GenEd requirements for DC ([http://coursecatalog.web.cmu.edu/schools-colleges/dietrichcollegeofhumanitiesandsocialsciences/#hampssgeneralizeducationprogram160](http://coursecatalog.web.cmu.edu/schools-colleges/dietrichcollegeofhumanitiesandsocialsciences/#hampssgeneralizeducationprogram160)) and MCS ([http://coursecatalog.web.cmu.edu/schools-colleges/melloncollegeofscience/](http://coursecatalog.web.cmu.edu/schools-colleges/melloncollegeofscience/)) are found on their respective Catalog pages.

Degree Requirements:

<table>
<thead>
<tr>
<th>Biological Sciences</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>03-151 or 03-121</td>
<td>Honors Modern Biology</td>
</tr>
<tr>
<td>Modern Biology</td>
<td></td>
</tr>
<tr>
<td>03-220 or 03-221</td>
<td>Genetics</td>
</tr>
<tr>
<td>Genomes, Evolution, and Disease: Introduction to Quantitative Genetic Analysis</td>
<td></td>
</tr>
<tr>
<td>03-231</td>
<td>Honors Biochemistry</td>
</tr>
<tr>
<td>03-320</td>
<td>Cell Biology</td>
</tr>
<tr>
<td>03-343</td>
<td>Experimental Techniques in Molecular Biology</td>
</tr>
<tr>
<td>03-411</td>
<td>Topics in Research</td>
</tr>
<tr>
<td>03-412</td>
<td>Topics in Research</td>
</tr>
<tr>
<td>03-xxx</td>
<td>General Biology Elective</td>
</tr>
<tr>
<td>03-3xx</td>
<td>Advanced Biology Elective</td>
</tr>
</tbody>
</table>

Total Biology units: 78

<table>
<thead>
<tr>
<th>Mathematics, Statistics, Physics and Computer Science</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-120 or 21-122</td>
<td>Differential and Integral Calculus</td>
</tr>
<tr>
<td>21-124 or 21-122</td>
<td>Calculus II for Biologists and Chemists</td>
</tr>
<tr>
<td>36-247 or 36-200</td>
<td>Statistics for Lab Sciences</td>
</tr>
</tbody>
</table>

Experimental Design for Behavioral & Social Sciences
or Statistical Concepts and Methods for Behavioral and Social Science

Physics I for Science Students
or Physics I for Engineering Students

Principles of Computing
or Fundamentals of Programming and Computer Science

Computing @ Carnegie Mellon

Total Science units: 63-65

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

Total Psychology units: 63

<table>
<thead>
<tr>
<th>Additional Advanced Elective</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Choose one of the following courses)</td>
<td></td>
</tr>
<tr>
<td>85-3xx</td>
<td>Advanced Psychology Elective</td>
</tr>
<tr>
<td>03-3xx</td>
<td>Advanced Psychology Elective</td>
</tr>
</tbody>
</table>

Total Elective units: 69-84

Minimum number of units required for degree: 360

Minors in Psychology and Cognitive Neuroscience

Minor in Psychology

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Introductory course</td>
</tr>
<tr>
<td>85-102</td>
</tr>
</tbody>
</table>

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

85-104
Research Methods in Cognitive Psychology
85-211
Biological Foundations of Behavior
85-212
Principles of Child Development
85-241
Social Psychology
85-251
Personality

III. Statistics

36-200
Reasoning with Data
36-309
Experimental Design for Behavioral & Social Sciences
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
85-311
Cognitive Neuroscience Research Methods
85-320
Research Methods in Developmental Psychology
85-330
Analytic Research Methods
85-340
Research Methods in Social Psychology

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

V. Advanced courses (minimum 9 units)

Advanced psychology courses exist within four areas (cognitive, cognitive neuroscience, developmental, social and health psychology.) Any advanced content course or seminar in psychology or any psychology course higher than 85-350. Exceptions for the advanced course requirement are: 85-480, 85-482, 85-484, 85-486, 85-488, 85-506, 85-508, 85-601, 85-602.

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

02-121
Modern Biology
03-363
Systems Neuroscience
85-219
Biological Foundations of Behavior
or 03-161
Molecules to Mind
85-211
Cognitive Psychology
or 03-362
Cellular Neuroscience

Distribution Requirements

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

Approaches to Cognitive Neuroscience
85-104
Psychopathology
85-106
Animal Minds
85-314
Cognitive Neuroscience Research Methods
85-382
The Psychology and Neuroscience of Consciousness
85-407
How the Brain Makes Meaning
85-408
Visual Cognition

85-412
Cognitive Modeling
85-414
Cognitive Neuropsychology
85-419
Introduction to Parallel Distributed Processing
85-435
Biologically Intelligent Exploration
15-386
Neural Computation
15-883
Computational Models of Neural Systems
36-746
Statistical Methods for Neuroscience and Psychology
86-375
Computational Perception

Cognitive Neuroscience Electives
03-133
Neurobiology of Disease
03-362
Cellular Neuroscience
03-365
Neural Correlates of Learning and Memory
85-211
Cognitive Psychology
85-359
Introduction to Music Cognition Research
85-360
Origins of Intelligence
85-370
Perception
85-385
Auditory Perception: Sense of Sound
85-351
What is Attention?

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.cmu.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 Zdrojkowski 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–

LOUIE L. HOLT, Professor of Psychology – Ph.D., University of Wisconsin; Carnegie Mellon, 1999–

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

ROBERTA KLAZTKY, 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–
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–

BONNIE NOZARI, Associate Professor - PhD, University of Illinois at Urbana-Champaign; Carnegie Mellon, 2011–

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