Neuroengineering & Medicine Courses

https://neuroengineering.ucdavis.edu/courses-interest-students

Students interested in Neuroengineering may take classes from a variety of different departments on campus. Please check the UC Davis General Catalog for the most up-to-date information about each of the courses listed below.

**Track Name Key**
- **Tech**: Neurotechnology & Computational Tools (Devices, in vitro models, control algorithms under development state)
- **Cog**: Cognitive Neuroengineering (Modulation of brain states, cognition, emotions)
- **Bionic**: NeuroBionics (Prosthetics, brain-machine interfaces)
- **Rehab**: Human Performance & Rehabilitation (Biomechanics, rehabilitation of movement disorders)
- **Rx**: Neurotherapeutics (Device-/molecular therapies for neurological disorders, cancer, etc.)
- **General**: Relevant to all tracks above

<table>
<thead>
<tr>
<th><strong>Tech Track Courses</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Neurotechnology &amp; Computational Tools (Devices, in vitro models, control algorithms under development state)</td>
</tr>
</tbody>
</table>

### Upper-Division Undergraduate Courses – Tech Track

- NPB 167/NSC 267—Computational Neuroscience
- DES 167—Prototyping: From Objects to Systems [Winter quarter]
- ECS 170—Introduction to Artificial Intelligence [Winter quarter]
- ECS 171—Machine Learning [Fall quarter]
- ECS 174—Computer Vision
- DES 178—Design & Wearable Technology
- ECS 188—Ethics in an Age of Tech [Fall quarter]
- ECS 189G—Special Topics in Computer Science: Artificial Intelligence

### Graduate Courses – Tech Track

- NSC 200LB—Laboratory Methods in Neurobiology [Winter quarter]
- STA 208—Statistical Methods in Machine Learning [Spring quarter]
- PSC 208A—Fundamentals of Human Electrophysiology
- STA 209—Optimization for Big Data Analytics [Fall quarter]
- PTX/MCP 215—Electrophysiology Techniques and Applications
- NSC/NPB 222—Systems Neuroscience [Winter quarter]
- BST 227—Machine Learning in Genomics [Spring quarter]
- EEC/EMS/ECH/MAE 245—Micro- and Nano-Technology in Life Sciences [Spring quarter]
- MAE 252—Information Processing for Autonomous Robotics
- BIM 254—Statistical Methods in Genomics
- NSC/NPB 267/NPB 167—Computational Neuroscience
- ECS 270—Artificial Intelligence
- ECS 271—Machine Learning and Discovery
- MAE 272—Theory and Design of Control Systems
- BIM 289A—Selected Topics in Biomedical Engineering; Design of Neural Control Systems [Winter quarter]
- BIM 289B—Selected Topics in Biomedical Engineering; Biomedical Imaging
- BIM 289C—Selected Topics in Biomedical Engineering; Computational Bioengineering
Cog Track Courses
Cognitive Neuroengineering (Modulation of brain states, cognition, emotions)

Lower-Division Undergraduate Courses – Cog Track
PHI 010—Introduction to Cognitive Science [Fall quarter]

Upper-Division Undergraduate Courses – Cog Track
PSC 135—Cognitive Neuroscience: The Biological Foundations of the Mind [Winter quarter]

Graduate Courses – Cog Track
PSC 208—Physiological Psychology
PSC 208A—Fundamentals of Human Electrophysiology
NSC 223/PSC 261—Cognitive Neuroscience [Spring quarter]

Bionic Track Courses
NeuroBionics (Prosthetics, brain-machine interfaces)

Upper-Division Undergraduate Courses – Bionic Track
NPB 165—Neurobiology of Speech Perception
ECS 171—Machine Learning [Fall quarter]
ECS 174—Computer Vision
ECS 189G—Special Topics in Computer Science: Artificial Intelligence

Graduate Courses – Bionic Track
STA 208—Statistical Methods in Machine Learning [Spring quarter]
STA 209—Optimization for Big Data Analytics [Fall quarter]
PTX/MCP 215—Electrophysiology Techniques and Applications
NSC/NPB 222—Systems Neuroscience [Winter quarter]
MAE 252—Information Processing for Autonomous Robotics
BIM 254—Statistical Methods in Genomics
NSC/NPB 267/NPB 167—Computational Neuroscience
ECS 270—Artificial Intelligence
ECS 271—Machine Learning and Discovery
MAE 272—Theory and Design of Control Systems
BIM 289C—Selected Topics in Biomedical Engineering; Computational Bioengineering
BIM 289E—Selected Topics in Biomedical Engineering; Analysis of Human Movement
EEC 289L—Introduction to Neuroengineering [Winter quarter]
MAE/BIM 298—Directed Group Study. Design of Neural Control Systems [Fall quarter]
MAE 298—Introduction to Neural-Machine-Interfaces and Assisted Human Movement [Fall quarter]
### Rehab Track Courses
Human Performance & Rehabilitation (Biomechanics, rehabilitation of movement disorders)

#### Upper-Division Undergraduate Courses – Rehab Track
- PMR 100—Research Approaches to Disability & Rehabilitation
- ECS 171—Machine Learning [Fall quarter]
- ECS 174—Computer Vision
- ECS 189G—Special Topics in Computer Science: Artificial Intelligence

#### Graduate Courses – Rehab Track
- STA 208—Statistical Methods in Machine Learning [Spring quarter]
- STA 209—Optimization for Big Data Analytics [Fall quarter]
- NSC/NPB 222—Systems Neuroscience [Winter quarter]
- BST 227—Machine Learning in Genomics [Spring quarter]
- MAE 252—Information Processing for Autonomous Robotics
- BIM 254—Statistical Methods in Genomics
- NSC/NPB 267/NPB 167—Computational Neuroscience
- ECS 270—Artificial Intelligence
- ECS 271—Machine Learning and Discovery
- MAE 272—Theory and Design of Control Systems
- BIM 289E—Selected Topics in Biomedical Engineering; Analysis of Human Movement
- EEC 289L—Introduction to Neuroengineering [Winter quarter]
- MAE/BIM 298—Directed Group Study. Design of Neural Control Systems [Fall quarter]
- MAE 298- Introduction to Neural-Machine-Interfaces and Assisted Human Movement [Fall quarter]

### Rx Track Courses
Neurotherapeutics (Device-/molecular therapies for neurological disorders, cancer, etc.)

#### Upper-Division Undergraduate Courses – Rx Track
- PMR 100—Research Approaches to Disability & Rehabilitation

#### Graduate Courses – Rx Track
- NSC 200LB—Laboratory Methods in Neurobiology [Winter quarter]
- PTX/MCP 215— Electrophysiology Techniques and Applications
- EEC/EMS/ECH/MAE 245—Micro- and Nano-Technology in Life Sciences [Spring quarter]
- BIM 289A—Selected Topics in Biomedical Engineering; Design of Neural Control Systems [Winter quarter]
- BIM 289B—Selected Topics in Biomedical Engineering; Biomedical Imaging
- BIM 289C—Selected Topics in Biomedical Engineering; Computational Bioengineering
- BIM 289D—Selected Topics in Biomedical Engineering; Cell and Tissue Biomechanics [Fall quarter]
- EEC 289L—Introduction to Neuroengineering [Winter quarter]
General Track Courses

Relevant to all tracks above

Lower-Division Undergraduate Courses - General Track

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Quarter</th>
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<tbody>
<tr>
<td>PHI 005</td>
<td>Critical Reasoning</td>
<td>Fall quarter</td>
</tr>
<tr>
<td>PHI 013G</td>
<td>Minds, Brains, &amp; Computers with Discussion</td>
<td>Fall quarter</td>
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<tr>
<td>PHI 015</td>
<td>Introduction to Bioethics</td>
<td>Fall quarter</td>
</tr>
<tr>
<td>NPB 017</td>
<td>The Path to Cyborgs: Introduction to Prostheses &amp; Human Machine Interfaces</td>
<td>Winter quarter</td>
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<tr>
<td>PHI 024</td>
<td>Introduction to Ethics</td>
<td>Fall quarter</td>
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<tr>
<td>PHI 030</td>
<td>Introduction to Philosophy of Science</td>
<td>Fall quarter</td>
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<tr>
<td>PHI 038</td>
<td>Introduction to Philosophy of Biology</td>
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Upper-Division Undergraduate Courses – General Track

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Quarter</th>
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<tbody>
<tr>
<td>STS 100</td>
<td>Methods in Science, Technology, &amp; Medicine Studies</td>
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<tr>
<td>UWP 102E</td>
<td>Writing in the Disciplines: Engineering</td>
<td>Fall quarter</td>
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<tr>
<td>NEU/CHA 103</td>
<td>Human Clinical Neuroanatomy</td>
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<tr>
<td>EXB 106/CHA 101</td>
<td>Human Gross Anatomy</td>
<td>Winter quarter</td>
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<td>EXB 106L/CHA 101L</td>
<td>Human Gross Anatomy Laboratory</td>
<td>Winter quarter</td>
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<tr>
<td>MAT/BIS 107</td>
<td>Probability and Stochastic Processes with Applications to Biology</td>
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<tr>
<td>PHI 115</td>
<td>Problems in Normative Ethics</td>
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<tr>
<td>PSC 121</td>
<td>Physiological Psychology</td>
<td>Winter quarter</td>
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<tr>
<td>PHI 121</td>
<td>Bioethics</td>
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<tr>
<td>NPB/PSC 124</td>
<td>Comparative Neuroanatomy</td>
<td>Winter quarter</td>
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<tr>
<td>PHE 131</td>
<td>Physical Activity &amp; the Disabled</td>
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<tr>
<td>PSC 135</td>
<td>Cognitive Neuroscience: The Biological Foundations of the Mind</td>
<td>Winter quarter</td>
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<tr>
<td>NPB 163</td>
<td>Systems Neuroscience</td>
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<tr>
<td>DES 166</td>
<td>Human Centered Design</td>
<td>Fall quarter</td>
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<tr>
<td>BIM 172</td>
<td>Neuroengineering Lab</td>
<td>Winter quarter</td>
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Graduate Courses – General Track

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Quarter</th>
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<tbody>
<tr>
<td>CLH 204</td>
<td>The Ethics of Research</td>
<td>Fall &amp; Winter quarter</td>
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<tr>
<td>CLH 207</td>
<td>Team Science</td>
<td>Winter quarter</td>
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<tr>
<td>CLH 208</td>
<td>Introduction to Grant Writing, I</td>
<td>Fall quarter</td>
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<tr>
<td>CLH 209</td>
<td>Introduction to Grant Writing, II</td>
<td>Winter quarter</td>
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<tr>
<td>CLH 214A</td>
<td>Biodesign I</td>
<td></td>
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<tr>
<td>CLH 214B</td>
<td>Biodesign II</td>
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<tr>
<td>NPB/NSC 287A</td>
<td>Topics in Theoretical Neuroscience</td>
<td>Fall quarter</td>
</tr>
<tr>
<td>NPB/NSC 287B</td>
<td>Topics in Theoretical Neuroscience</td>
<td>Winter quarter</td>
</tr>
<tr>
<td>EEC 289L</td>
<td>Introduction to Neuroengineering</td>
<td>Winter quarter</td>
</tr>
<tr>
<td>BIM/NSC 295</td>
<td>Literature in Neuroengineering</td>
<td>Fall quarter</td>
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</tbody>
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