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

Tech Track Courses

Neurotechnology & Computational Tools (Devices, in vitro models, control algorithms under development state)

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

BIM 289D—Selected Topics in Biomedical Engineering; Cell and Tissue Biomechanics [Fall quarter]
EEC 289L—Introduction to Neuroengineering [Spring quarter]
EEC 289Q—Special Topics in Electrical and Computer Engineering; Computer Engineering
ECS 289G—Special Topics in Computer Science: Artificial Intelligence [Fall 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]

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 [Spring 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 [Spring 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 [Spring quarter]

General Track Courses

Relevant to all tracks above

Lower-Division Undergraduate Courses - General Track

PHI 005—Critical Reasoning [Fall quarter]
PHI 013G—Minds, Brains, & Computers with Discussion [Fall quarter]
PHI 015—Introduction to Bioethics [Fall quarter]
NPB 017—The Path to Cyborgs: Introduction to Prostheses & Human Machine Interfaces [?Winter quarter]
PHI 024—Introduction to Ethics [Fall quarter]
PHI 030—Introduction to Philosophy of Science [Fall quarter]
PHI 038—Introduction to Philosophy of Biology

Upper-Division Undergraduate Courses – General Track

STS 100—Methods in Science, Technology, & Medicine Studies
UWP 102E—Writing in the Disciplines: Engineering [Fall quarter]
NEU/CHA 103—Human Clinical Neuroanatomy
EXB 106/CHA 101—Human Gross Anatomy [Winter quarter]
EXB 106L/CHA 101L—Human Gross Anatomy Laboratory [Winter quarter]
MAT/BIS 107—Probability and Stochastic Processes with Applications to Biology
PHI 115—Problems in Normative Ethics
PSC 121—Physiological Psychology [Winter quarter]
PHI 121—Bioethics
NPB/PSC 124—Comparative Neuroanatomy [Winter quarter]
PHE 131—Physical Activity & the Disabled
PSC 135—Cognitive Neuroscience: The Biological Foundations of the Mind [Winter quarter]
NPB 163—Systems Neuroscience
DES 166—Human Centered Design [Fall quarter]
BIM 172—Neuroengineering Lab [Winter quarter]

Graduate Courses – General Track

CLH 204—The Ethics of Research [Fall & Winter quarter]
CLH 207—Team Science [Winter quarter]
CLH 208—Introduction to Grant Writing, I [Fall quarter]
CLH 209—Introduction to Grant Writing, II [Winter quarter]
CLH 214A—Biodesign I
CLH 214B—Biodesign II
NPB/NSC 287A—Topics in Theoretical Neuroscience [Fall quarter]
NPB/NSC 287B—Topics in Theoretical Neuroscience [Winter quarter]
EEC 289L—Introduction to Neuroengineering [Spring quarter]
BIM/NSC 295—Literature in Neuroengineering [Fall quarter]