BIO-382 **Neuroscience for engineers**

Blanke Olaf

Cursus	Sem.	Type
Life Sciences Engineering	BA6	Opt.

Language of teaching	English
Credits	4
Session	Summer
Semester	Spring
Exam	Written
Workload	120h
Weeks	14
Hours	**4 weekly**
Courses	2 weekly
Exercises	2 weekly
Number of positions	

Summary

This optional course provides students who consider a specialization in Neuroengineering during their Master with a very broad overview of the many practical applications in the field. It should ensure these students to be well informed when choosing their specialization.

Content

• **General Introduction & Visual system** (Blanke)
Exercises: To virtual reality (Blanke)

• **Vision: Perception, Neurophysiology, Neuroimaging** (Herzog)
Exercises: Computer Vision (Herzog)

• **Hodgkin-Huxley model: from Ion channels to Mathematics** (Gerstner)
Exercises: Neuron modelling (Gerstner)

• **Large scale modelling of the brain** (Markram)
Exercises: Blue Brain (Schürmann)

• **Systems: Audition**(BMI professor)
Exercises: Cochlear Implants (External)

• **Systems: Somatosensation and Optogenetics** (Petersen)
Exercises: Optogenetics (Petersen)

• **Systems: Motor** (Luthi-Carter)
Exercises: Parkinson's and Huntington Disease, ALS (Moore)

• **Neuroprosthetics: Artificial Arms** (Blanke)
Exercises: Neuroprosthetics (Blanke)

• **Neuroprosthetics: BCI and EEG** (Blanke)
Exercises: Brain-Computer Interface (Millan)

• **Brain metabolism and Neuroimaging**(Magistretti)
Exercises: Physics of Brain imaging (Gruetter)

• **MRI in humans**(Hadjikhani)
Exercises: Diffusion Tensor Imaging (Thiran)

• **Memory**(Sandi)
Exercises: Memory (Sandi)

• **Alzheimer Disease** (Fraering)
Exercises: Therapeutic interventions (Fraering)

• **Language and Summary** (Blanke)
Exercises: Aphasia (Blanke)

Resources

Ressources en bibliothèque

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