

# Signal and Data Analysis in Neuroscience

**Course number:** 27-505

**Lecturer:** Prof. Izhar bar Gad

**Semester:** 2

**Hours:** 2+1 h/w

## Course goals

Provide the basis for enabling the analysis of signals and data acquired in the various fields related to brain sciences.

## Course topics

- Signals & data in neuroscience
- Stochastic processes
- Poisson processes
- Single spike train
- Multiple spike trains
- Event related activity

- Neural encoding
- Neural discrimination
- Neural decoding
- Optimization
- Information theory
- Frequency domain
- Systems
- Filters
- Spectral analysis
- Wavelets
- Clustering
- Dimensionality reduction
- Independent component analysis (ICA)



**Course Website:** <https://www.ibglab.org/courses>

## Course requirements

Homework submission, passing the exams

## Final grade

Homework 50%

Two exams, 25% each

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Multidisciplinary Brain  
Research Center | Bar-Ilan  
University Ramat-Gan,  
5290002 Israel | Telephone:  
972.3.5317755 | Fax :  
972.3.7384173 | [Contact Us](#)

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