### Course descriptions

<table>
<thead>
<tr>
<th>Course name:</th>
<th>Neural interfaces and prostheses</th>
<th>Credits:</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class type, hours per week:</td>
<td>lecture 2, classroom practice 2</td>
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<tr>
<td>Type of the exam:</td>
<td>weekly written tests from the subject of the previous week, two written tests in the course of the semester, oral examination at the end of the course</td>
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<tr>
<td>Prerequisites:</td>
<td>Electrophysiological methods for the study of the nervous- and muscular-systems</td>
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### Course description:

The course makes the students familiar with neuroprosthetic devices that can substitute motor, sensory or cognitive functions. These devices make direct interfaces with the peripheral and central nervous system. Some of these devices are already routinely used in the clinical practice like the cochlear prostheses for restoring hearing others are still in the developmental phase. Neural interface is a connection between the living tissue and a man-made device, in most case a bioelectrode. Neuroprosthetic research is integrating different fields of medical and engineering disciplines.  

**Topics of the course:**
- Physiological basis of electrical stimulation  
- Functional electrical stimulation  
- Application of electrical stimulation in the neuroscience  
- Stereotaxic technique, chronic implantation of electrodes  
- Deep brain stimulation  
- Transcranial magnetic stimulation, DC electrical brain stimulation  
- Physiological basis of brain-computer interface  
- Cochlear function, implantable hearing aids  
- Cochlear prostheses, stimulation strategies  
- Retinal prostheses

### Required reading:

The lecture material are distributed to the students in form of handout.

### Recommended reading:


### Lecturer:

- György Karmos, M.D., Ph.D., emeritus professor

### Additional lecturers:

- István Ulbert, M.D. D.Sc., professor, Domonkos Horváth, Tamás Molnár, Bálint Péter Kerekes PhD students