EEG in neurology and neuroscience 2018

Course organizers:
Prof. Micah Murray micah.murray@chuv.ch
PD Dr. David Benninger david.benninger@chuv.ch
Dr. Mehdi Ordikhani-Seyedlar mehdi.ordikhani@gmail.com

Contributing faculty:
• Dr. Jerome Barral Jerome.Barral@unil.ch Movement/ Motor control
• PD Dr. David Benninger david.benninger@chuv.ch Brain stimulation / movement
• Dr. Andrea Biasiucci andrea.biasiucci@epfl.ch Machine learning methods
• Prof. Aki Kawasaki aki.kawasaki@fa2.ch Pupillometry & Chronobiology
• Dr. Jean-François Knebel jean-francois.knebel@chuv.ch ERP analysis
• Dr. Corinne Kostic corinne.kostic@fa2.ch Pupillometry
• Prof. Micah Murray micah.murray@chuv.ch Electrical neuroimaging
• Prof. Kerstin von Plessen kerstin.plessen@gmail.com neuropsychiatry
• Dr. Mehdi Ordikhani-Seyedlar mehdi.ordikhani@gmail.com BCI
• Prof. Andrea Rossetti andrea.rossetti@chuv.ch Neurological EEG
• PD Dr. Francesca Siclari Francesca.siclari@chuv.ch Sleep

Course Dates and location:
• The course consists of 2 modules (Week 1 and Week 2) that can be taken together or separately
  (Module 1: March 5th-9th, 2018 / Module 2: March 12th-16th, 2018)
• 2 ECTS credits can be obtained for each course module
• There is one date for the ELECTRONIC EXAM for the course, independently of whether a student is
  enrolled in one or both weeks.

Course objectives:
• Offer students a review of the basics of electromagnetic brain mapping with an emphasis on recent
  developments in the theory and methods
• Familiarize students with the practicalities of EEG acquisition and analyses in clinical and basic
  research via hands-on experience
• Familiarize students with the literature as well as strengths/limits of EEG as a method for clinical and
  basic research
• Provide the ability for students to conceive a research project involving EEG
• Provide an active exchange between Ph.D. and M.D. students

Course description:
• This intensive course will include a combination of lectures, journal club discussions, and practical
  experience. The course is divided into separate 1-week long sessions. Students can register for either
  or both weeks.
• Journal clubs will cover 1 article. Articles for the journal clubs will be disseminated to enrolled
  students by February 21. The process for the presentation/discussion of journal club articles is
  described below.
• Practical work will entail students working in small groups and rotating over the afternoon session
  between the laboratory itself and a setting where data can be preprocessed and analyzed.
Students’ grades will be based on 2 aspects:
- Journal Club presentation (25% of total grade)
- Electronic written examination (75% of total grade)

The journal club presentation
- Each student will be assigned by to 1 of the 5 articles and should together with the other students assigned to the same article prepare a PowerPoint presentation (MAXIMUM 10-15 minutes in duration) entailing the following sections:
  a) Summary of the article
  b) Positive and negative criticisms
  c) Open issues and how to address them
- The students assigned to a given article should also be fully prepared to animate a discussion with the rest of the participants in the course. This can take any of several forms including, discussion of other pertinent literature, elaboration of ideas for specific experiments to address unresolved issues, consideration of clinical applications, etc. In short, the discussion should demonstrate students’ abilities to think critically and to pose targeted questions to one’s colleagues.
- On the day that a given article is to be discussed, the course organizers will randomly select from the students assigned to that article the person to present the summary, the criticisms, and the open issues. The other students assigned to that article will animate the discussion. In this way, all students assigned to a given article should be prepared for all aspects of the presentation/discussion.

Electronic written examination
- At 9:00am on the morning of April 30th examination questions for each week of the course will be disseminated to all students by email (students will of course only need to respond to the questions corresponding to the course week(s) they followed). If a student does not receive these questions, he/she has the responsibility to contact one of the course organizers to ensure transmission of the examination.
- Exams must be written in English.
- The completed examination must be sent to ALL of the course organizers by 5pm on May 5th. NO EXCEPTIONS WILL BE MADE. Our email addresses appear above.
- Each course organizer will provide 2 questions. The replies to both of the questions of any course organizer should not exceed 1 single-space typed page (minimum 11-point font).
- Each course organizer will provide a grade (1 to 6) for the cumulative replies to his/her questions.
- To pass the course, students cannot receive a grade below 4.0 from more than 1 course organizer on the written exam, and the average of the grades across the topics (each proposed by one course organizer) may not be below 4.
- MD and PhD students will all complete the same examinations. The course organizers expect a more elaborated level from the PhD students. That is, PhD students should demonstrate a higher level of mastery of experimental design, statistical analysis, and critical thinking about data interpretation. These elements should be reflected in the written examinations.

Registration
The course is limited to 24 participants. Lemanic PhD students register before February 2, 2018 by writing a mail to lndscourses@gmail.com (with your supervisor in copy) and stating "EEG module 1" OR "EEG module 1" OR "EEG module 1&2" as subject.
### Course Schedule

<table>
<thead>
<tr>
<th>Week1</th>
<th>9-11am</th>
<th>11-12</th>
<th>12-1:30</th>
<th>1:30-4:30</th>
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<tbody>
<tr>
<td><strong>Monday March 5</strong>&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Rossetti – Clinical EEG</td>
<td>Journal Club 1</td>
<td>Lunch</td>
<td>Practical work – Clinical EEG</td>
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<td><strong>Tuesday March 6</strong>&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Murray - ERPs</td>
<td>Journal Club 2</td>
<td>Lunch</td>
<td>Practical work – ERPs</td>
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<td><strong>Wednesday March 7</strong>&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Siclari - Sleep</td>
<td>Journal Club 3</td>
<td>Lunch</td>
<td>Practical work – Sleep</td>
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<td><strong>Thursday March 8</strong>&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Benninger – Brain Stimulation</td>
<td>Journal Club 4</td>
<td>Lunch</td>
<td>Practical work – Brain Stimulation</td>
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<td><strong>Friday March 9</strong>&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Kawasaki - Pupillometry</td>
<td>Journal Club 5</td>
<td>Lunch</td>
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<tr>
<th>Week2</th>
<th>9-11am</th>
<th>11-12</th>
<th>12-1:30</th>
<th>1:30-3:30</th>
<th>3:30-4:30</th>
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<tr>
<td><strong>Monday March 12</strong>&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Biasucci – Machine learning</td>
<td>Journal Club 5</td>
<td>Lunch</td>
<td>Practical work – Machine Learning</td>
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<td><strong>Tuesday March 13</strong>&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Ionta – sensorimotor</td>
<td>Journal Club 6</td>
<td>Lunch</td>
<td>Practical work – sensorimotor interactions</td>
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<td><strong>Wednesday March 14</strong>&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Barral – movement</td>
<td>Journal Club 7</td>
<td>Lunch</td>
<td>Practical work – movement</td>
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<td><strong>Thursday March 15</strong>&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Ordikhani – BCI</td>
<td>Journal Club 8</td>
<td>Lunch</td>
<td>Practical work – BCI</td>
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<tr>
<td><strong>Friday March 16</strong>&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Von Plessen - Psychiatry</td>
<td>Journal Club 9</td>
<td>Lunch</td>
<td>Matusz – Development &amp; Attention</td>
<td>Journal Club 10</td>
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### Course Locations

All courses take place in Lausanne, Bugnon (BU) area, accessible by Metro M2 from Lausanne CFF, stop « CHUV ». A detailed map of the auditoria can be found [here](#).

05.03.2018 BU19 04-Pierre Decker (Rue Bugnon 19)
06.03.2018 BU19 04-Pierre Decker
07.03.2018 BU19 04-Pierre Decker
08.03.2018 BH08 4 - Mathias Mayor (CHUV main building)
09.03.2018 BH08 2 - Auguste Tissot (CHUV main building)
12.03.2018 BU19 04-Pierre Decker
13.03.2018 BU19 04-Pierre Decker
14.03.2018 BU19 04-Pierre Decker
15.03.2018 BU19 04-Pierre Decker
16.03.2018 (Morning) BT03 – Hôpital Beaumont
16.03.2018 (Afternoon) Placide Nicod – Hôpital Orthopedique