09:00 Welcome and introduction
09:15 Lecture: **TMS Physiology and Common Measures**
   - Physiology of transcranial motor cortex stimulation
   - Basic principles of magnetic and electrical stimulation
   - Physiology of transcranial magnetic and electrical motor cortex stimulation
   - Common measurements and applications of single-pulse TMS
10:15 Lecture: **TMS Safety - Contraindications & Ethics**
10:45 Break
11:00 Practical session: **Single Pulse TMS**
   - Brief familiarisation with hardware and setup, followed by demonstration of TMS. Delegates will be asked to:
   - Locate motor hotspot for a hand muscle
   - Find resting motor threshold
   - Recognise relevant features of the motor evoked potential (MEP) and how they are affected by intrinsic and extrinsic factors
   - Stimulus-response curve
13:00 Lunch
14:00 Lecture: **Applications of TMS in Research**
   - Overview of how TMS is applied, looking at and discussing studies that have used TMS as a tool to investigate causal brain-behaviour relations
   - Effects on behaviour (online/offline lesions)
15:00 Practical session: **Neuronavigation and TMS**
   - Delegates will have the opportunity to practice:
   - Locating and recording the hotspot using Brainsight (MEP guided approach)
   - Attempt to map a hand representation of the motor cortex
   - Locate the hotspot using MRI image of the brain (anatomy guide approach)
16:30 Lecture: **Influences on the Excitability of the Brain / rTMS for the induction of plasticity**
   - Induction of plasticity-life processes via rTMS (intrinsic and extrinsic plasticity)
   - rTMS protocols
   - Safety
   - Effects on intracortical excitability and cortico-cortical connectivity
   - Note of caution: inter- and intra-individual variability
17:30 Wrap up day one

**Day One**
Day Two

09:30  Lecture: **Paired-Pulse TMS**
- Insights into intracortical circuitry
- Basic principles of paired-pulse TMS
- Physiology of cortical circuits investigated with paired-pulse TMS
- Research and clinical applications

10:30  **Practical session: Paired-Pulse TMS**
- Initial demonstration of paired-pulse TMS paradigms
- Delegates will be asked to:
  - Find the hotspot, resting, and active motor thresholds
- Use and interpret some intracortical inhibitory and facilitatory paradigms:
  - Short-interval intracortical inhibition (SICI)
  - Intracortical facilitation (ICF)
  - Short-interval intracortical facilitation (SICF)
  - Long-interval intracortical inhibition (LICI)

13:00  Lunch

14:00  Lecture: **Twin-coil TMS**
- Insights into cortico-cortical connectivity
- Basic principles of twin-coil TMS
- Intra- and inter-hemispheric circuits activated by twin-coil TMS
- Research and clinical applications

14:30  **Practical session: Twin-coil TMS**
- Initial demonstration of twin-coil TMS to assess cortico-cortical connectivity
- Delegates will be asked to:
  - Find bilateral hotspots
- Use and interpret intracortical and facilitatory paradigms
  - Inter-hemispheric inhibition (IHI)

15:30  **Practical session: rTMS and Robot Positioning**
- Delegates will be split into two groups who will rotate between the two practical sessions:
  - **Group A:** rTMS systems and protocols
    - 1Hz, 10Hz, cTBS, iTBS, and QPS
  - **Group B:** TMS using navigated robotics

16:30  **Group Q&A session**
- Discuss and review delegates’ research concepts and ideas
- Discuss the potential and relevance of TMS in future research projects
- Future training/workshop requirements

17:00  Workshop summary and wrap up