The Sainsbury Wellcome Centre for Neural Circuits and Behaviour (SWC) is a new initiative funded by the Wellcome Trust and the Gatsby Charitable Foundation. Located within University College London, the SWC combines molecular, optical, physiology and behaviour approaches to investigate how brain circuits create the neural representations that guide behaviour. The SWC has close ties with the Gatsby Computational Neuroscience Unit with whom it shares a new building - purpose built for collaborative interaction between experimental and theoretical neuroscientists.

**Year 1**

**Pre-Term “Boot Camp” (September)**
All new students will arrive in early September. Housing will be provided and a number of social/training activities will be organized during this introductory mini-term. This buffer period will also provide students new to London additional time to settle, find housing, and sort out other logistics.

- Week 1: Orientation and Animal-Training course
- Week 2: Hardware Essentials: Microcontrollers, Sensors, Actuators and Robots
- Week 3: Coding Crash Course: Python (interpreted), Julia (JIT), and compiled languages (C#)
- Week 4: Fundamental Maths of Neuroscience: Linear Algebra, DfEQ, Stats/Prob, etc.

**Fall Term (October-December)**
There will be two mandatory courses running in parallel during the Fall term for first-year students:

- Theoretical and Systems Neuroscience
- Experimental Neuroscience

The term will be divided into 5 two-week modules (Intro, Motor, Sensory, Learning, and Cognitive Systems). For the Theoretical and Systems course, each module will have two systems and two theoretical lectures with related assignments. Experimental course projects will be aligned with the module topics.

*Module 1: Systems Neuroscience Basics*
  Experimental: Core Techniques (Microscopy and Histology/Anatomy)

*Module 2: Motor Systems*
  Experimental: Optics, Imaging, and Genetics

*Module 3: Sensory Systems*
  Experimental: Electrophysiology and Molecular Biology

*Module 4: Learning Systems*
  Experimental: Behaviour

*Module 5: Cognitive Systems*
  Experimental: Course Project
**Winter Term (January-March)**

During the first week back from holidays, students will present the results of their *Experimental* course project.

**Open SWC:** During the second week back, the labs of the SWC will host an “open week” in which all first-year students can come to existing rigs to brainstorm and design/attempt a group experiment. The goal will be to collect interesting datasets for subsequent analysis during the forthcoming “Methods in Data Analysis” half-term course.

At this point (end of January), the SWC students will begin the first of three rotations. They will also participate in the “Data Analysis” course along with their Gatsby peers. They will be assigned a dedicated slot in the Systems Neuroscience Journal Club series and will each host and introduce a speaker in the Systems Neuroscience Seminar Series; this will be considered part of their PhD course-work.

**SWC Students:** Systems journal club/Systems seminar series, **Rotation #1**

**Methods in Data Analysis**

This half-term (5-week, bi-weekly) course focuses on data analysis strategies for modern experiments in systems neuroscience: STCOV, population dynamics, behavioural space, etc. Ideally, data used for this analysis will be gathered during the “Open SWC” week by first-year student teams supervised by their SWC colleagues.

**Systems Neuroscience Journal Club**

Mirroring the Theoretical Neuroscience Journal Club of the Gatsby Unit, the Systems Neuroscience Journal Club will highlight important (new or old) papers in the field via a detailed presentation by a member of the SWC (PIs, post-docs, and students). During the Winter and Spring terms, each first year student will be tasked with giving one Journal Club presentation. They will be paired with a senior member of the SWC to help prepare and practice their presentation.

**Systems Neuroscience Seminar Series**

External invited speakers will be hosted by members of the SWC. During the Winter and Spring terms, first-year SWC students will serve as hosts and will introduce the speaker.

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**Spring Term (April-June)**

Similar to the winter term.

**SWC Students:** Systems journal club/Systems seminar series, **Rotation #2**

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**Summer Term (July-September)**

At the end of this term, SWC students will have chosen their lab and selected a potential PhD project.

**SWC Students:** Systems journal club/Systems seminar series, **Rotation #3**

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**Year 2**

**Fall Term (October-December)**

SWC students begin work on their PhD project.

*In early December, SWC students present their PhD project as a qualifying exam.*