

TENSS 2016 Schedule

DATE	DAY	TIME SLOT	MAIN RESPONSIBLE	GROUPS	CONTENT
31/5/2016	0	19:00 – 20:30 20:30 – 21:30	Florin, Raul, Adam Dinner		Introduction to the course and the people
1/6/2016	1	08:00 – 09:00 09:00 – 10:00 10:00 – 11:00 11:00 – 12:00 12:00 – 12:15 12:15 – 13:00 13:00 – 14:00 14:00 – 16:00 16:00 – 16:30 16:30 – 18:00 18:00 – 20:30 20:30 – 21:30 21:30 – 23:00	Florin Albeanu Adriana TAs TAs Mehrab TAs TAs	 ABCD ABCD ABCD ABCD	Morning run/swim Breakfast Intro to Optics Intro to image formation Coffee break Simple microscopes : Lenses and image formation properties Lunch Simple microscopes : Lenses and image formation properties Coffee Koehler Illumination: numerical aperture and resolution Bench-top koehler microscopes – depth of field and aperture Dinner Bench-top koehler microscopes – depth of field and aperture
2/6/2016	2	08:00 – 09:00 09:00 – 10:00 10:00 – 11:00 11:00 – 11:15	 Priyanka/Mehrab		Morning run/swim Breakfast Recap – diffraction, resolution, numerical aperture, objectives Coffee break

11:15 – 13:00	Florin Albeanu		Fluorescence: Wide-field epi-fluorescence, PSFs and resolution, dF/F, bleaching, ratiometry (dF/dR)
13:00 – 14:00			Lunch
14:00 – 16:30	TAs	ABCD	Convert bench-top koehler microscopes to epi-fluorescence
16:30 – 16:45			Coffee break
16:45 – 18:30	Adam / Goncalo		Detecting signals: Noise, Cameras, PMTs and diodes, Introducing lab session on noise measurements
18:30 – 20:30	TAs	ABCD	Noise measurements, measure PSFs using fluorescent beads
20:30 – 21:30			Dinner
21:30 – 24:00	TAs	ABCD	Discussion, analysis, continue Labs

3/6/2016	3	08:00 – 09:00		Morning run/swim
		09:00 – 10:00		Breakfast
		10:00 – 11:30	Juan Burrone	Fluorescent probes: GFP, calcium indicators vs. voltage dyes, synaptophluorins
		11:30 – 11:45		Coffee break
		11:45 – 13:00	Tomas, Goncalo	Programming I: Basics
		13:00 – 14:00		Lunch
		14:00 – 15:00	Jim Watson	Going for the scientific gold!
		15:00 – 17:30	Fede, Tomas, Goncalo	Programming II: Arduinos
		17:30 – 17:45		Coffee break
		17:45 – 20:30	TAs	Image fixed brain slices on the bench-top fluorescence microscopes. Analyze noise and PSF measurements, compile results and make presentations.
		20:30 – 21:30		Dinner
		21:30 onwards	TAs	Continuation of analysis and making presentations.

4/6/2016	4	08:00 – 09:00	Tomas, Goncalo		Morning run/swim		
		09:00 – 10:00			Breakfast		
		10:00 – 11:00			Student presentations (10 + 5 minutes): PSFs, noise characterization of wide-field microscopes		
		11:00 – 13:00			Programming III: Matlab and Data acquisition		
		13:00 – 14:30			Buffet Lunch with student chalk talks		
		14:30 – 20:30			Free time to relax		
		20:30 onwards			Dinner and party		
<hr/>							
5/6/2016	5	08:00 – 09:00			Morning run/swim		
		09:00 – 10:00			Breakfast		
		10:00 – 11:30		Mark Hubener		Intrinsic Imaging - Principles and Intro to Lab session - practical aspects and comparison with wide field fluorescence imaging	
		11:30 – 11:45		Florian Engert		Coffee break	
		11:45 – 13:00				Scanning and Confocal Microscopy	
		13:00 – 14:00				Lunch	
		14:00 – 16:00		TAs	AB		Set up microscopes for intrinsic and widefield fluorescence imaging and determine optimal imaging parameters
				Rob	CD		Set up bench top scanners and simple beam alignment
		16:00 – 16:30					Coffee break
		16:00 – 20:30		TAs	AB		Image intrinsic optical and fluorescence signals, analyze acquired signals
				Rob	CD		Write scanning software
20:30 – 21:30				Dinner			
21:30 – 23:00	TAs	ABCD		Continue respective lab sessions			
<hr/>							
6/6/2016	6	08:00 – 09:00			Morning run/swim		
		09:00 – 10:00			Breakfast		
		10:00 – 12:00		Rob	AB		Set up bench top scanners and simple beam alignment
TAs	CD			Set up microscopes for intrinsic and widefield fluorescence imaging and determine optimal imaging parameters			

12:00 – 13:00			Early Lunch
13:00 - 14:00	Ruben Portugues		Light Sheet and Light Field Microscopy
	Rob	AB	Write scanning software
14:00 – 18:15	TAs	CD	Image intrinsic optical and fluorescence signals, analyze acquired signals
18:15 – 18:30			Coffee break
18:30 – 20:30	TAs, Ruben	ABCD	Light sheet demo / Continue respective lab sessions
20:30 – 21:30			Dinner
21:30 – 23:00			Student presentations (10 + 5 minutes): Widefield imaging
23:00 onwards	TAs, Ruben		Continue Light sheet demo or lab sessions if needed

7/6/2016	7	08:00 – 09:00		Morning run/swim
		09:00 – 10:00		Breakfast
		10:00 – 11:15	Georg Keller	Two-photon microscopes – Theory, Microscope basics, Resonant scanning, Example applications in neuroscience
		11:15 – 11:30		Coffee break
			Rob	AB
		11:30 – 13:00	Florin	CD
				Write X-Y- Z scanning and image acquisition software
				Building a two-photon microscope – general discussion on practical aspects and optical diagram
		13:00 – 14:00		Lunch
			Rob	AB
		14:00 – 19:00	TAs	CD
				Write X-Y- Z scanning and image acquisition software
				Building a two-photon microscope - lab
		19:00 – 19:15		Coffee break
		19:15 – 20:30	Na Ji	Adaptive Optics
		20:30 – 21:30		Dinner
		21:30 – 23:00	TAs	ABCD
				Continuation of lab sessions

8/6/2016	8	08:00 – 09:00		Morning run/swim
		09:00 – 10:00		Breakfast
		10:00 – 11:15	Florin	Optogenetics and stimulation methods (LEDs, fibers, DLP)
		11:15 – 11:30		Coffee break

11:30 – 13:00	Florin	AB	Building a two-photon microscope – general discussion on practical aspects and optical diagram
	Rob	CD	Write X-Y- Z scanning and image acquisition software
13:00 – 14:00			Lunch
14:00 – 19:00	TAs	AB	Building a two-photon microscope - lab
	Rob	CD	Write X-Y- Z scanning and image acquisition software
19:00 – 19:15			Coffee break
19:15 – 20:30	Na Ji		Structured Illumination via Phase modulation and Temporal
20:30 – 21:30			Dinner
21:30 – 23:00	TAs	ABCD	Continuation of lab sessions

9/6/2016	9	08:00 – 09:00		Morning run/swim
		09:00 – 10:00		Breakfast
		10:00 – 11:00	Marius	Introduction to 2p data analysis
			TAs	AB In vivo 2p Lab imaging session
		11:00 – 13:00	Marius, Georg	CD Image Analysis / VR, Miniature Microscope demo
		13:00 – 14:00		Lunch
		14:00 – 16:00	Marius, Georg	CD Image Analysis / VR, Miniature Microscope demo
			TAs	AB In vivo 2p Lab imaging session
		16:00 – 16:30		Coffee
		16:30 – 19:30	Marius, TAs	ABCD Analysis of 2p imaging data
		19:30 – 20:30	Hannan Monyer	TBA
		20:30 – 21:30		Dinner
		21:30 – 23:30	Marius, TAs	ABCD Analysis of 2p imaging data, make presentations

10/6/2016	10	08:00 – 09:00		Morning run/swim
		09:00 – 10:00		Breakfast
		10:00 – 11:15	Nacho	Intro to Animal Behavior and Machine Vision/Bonsai
		11:15 – 11:30		Coffee
		11:30 – 13:00		Student presentations - multiphoton microscopy
		13:00 – 20:30		Picnic/Barbecue on the hills featuring Florian and LASERS

20:30 onwards

Dinner and Party

11/6/2016	11	08:00 – 09:00			Morning run/swim
		09:00 – 10:00			Breakfast
		10:00 – 11:15	Upi Bhalla		Biophysics of neurons - RC circuits, dipoles and impedance (Introduce 'cell in a dish' lab demo)
		11:15 – 11:30			Coffee break
		11:30 – 13:00	Petr		Introduction to chronic extracellular recordings
		13:00 – 14:00			Lunch
		14:00 – 17:00	Upi, Mehrab, Adriana	AB	Cell in a dish: Bench top electronics and basics of electrophysiology, Tetrode Making
			TAs	CD	Animal behavior I - Assembling a simple re-inforcement learning setup
		17:00 – 17:30			Coffee break
		17:30 – 20:30	TAs	AB	Animal behavior I - Assembling a simple re-inforcement learning setup
	Upi, Mehrab, Adriana	CD	Cell in a dish: Bench top electronics and basics of electrophysiology, Tetrode Making		
20:30 – 21:30			Dinner		
21:30 – 23:00	Georg Keller		Virtual reality and closed loop behaviors - Mice		

12/6/2016	12	08:00 – 09:00			Morning run/swim
		09:00 – 10:00			Breakfast
		10:00 – 13:00	TAs	AB	Building Tetrodes and tetrode drives
				CD	Animal behavior II - machine vision
		13:00 – 14:00			Lunch
		14:00 – 15:15	Tomas Hromadka		Introduction to patch clamp
		15:15 – 16:15	Suhasa		Autopatcher
		16:15 – 16:30			Coffee break
		16:30 – 19:30	TAs	AB	Animal behavior II - machine vision
				CD	Building Tetrodes and tetrode drives
19:30 – 20:30			Early Dinner		

20:30 – 21:30 Tom Flogel
 21:30 – 24:00 ABCD Combining two photon with behavior and physiology
 Continue building drives

13/6/2016 13 08:00 – 09:00 Morning run/swim
 09:00 – 10:00 Breakfast
 10:00 – 13:00 TAs AB Physiology basics - record from implanted mice, spike detection,
 sorting, optogenetic tagging
 TAs CD Animal behavior III
 13:00 – 14:00 Lunch
 14:00 – 15:00 Tony Zador TBA
 TAs AB Animal behavior III
 15:00 – 18:00 TAs CD Physiology basics - record from implanted mice, spike detection,
 sorting, optogenetic tagging
 18:00 – 18:30 Coffee break
 18:30 – 20:30 Balazs, TAs ABCD Analysis of acquired data (filtering, spike sorting, PSTH)
 20:30 – 21:30 Dinner
 21:30 – 22:30 Danko Nikolic Analysis of neural data: cross-/scaled-correlation, PSTHs, tuning
 curves, spike-sorting
 22:30 – 24:00 TAs ABCD Continue analysis

14/6/2016 14 08:00 – 09:00 Morning run/swim
 09:00 – 10:00 Breakfast
 10:00 – 13:00 TAs AB Physiology III - recording from behaving mice
 Tomas, Suhasa CD In vivo patch clamp
 Karel Svoboda TBA
 14:00 - 15:00
 15:00 – 17:00 Tomas, Suhasa AB In vivo patch clamp
 TAs CD Physiology III - recording from behaving mice
 17:00 – 17:30 Coffee break
 17:30 – 20:30 ABCD Continue lab/analysis/presentation making
 20:30 – 21:30 Dinner
 21:30 – 22:30 ABCD Continue lab/analysis/presentation making

22:30 – 24:00

ABCD **Student Talks**

15/6/2016	DAY 15	08:00 – 09:00			Morning run/swim
		09:00 – 10:00			Breakfast
		10:00 – 20:30			Trip to Cluj and Turda
		20:30 – onwards			Dinner and Party

16/6/2016	DAY 16	08:00 – 09:00			Morning run/swim
		09:00 – 10:00			Breakfast
		10:00 – 11:00	<i>Mike Dickinson</i>		Sensory-motor integration in the flight control behavior of fruit flies
		11:00 – 12:00	<i>Tamas Freund</i>		The reciprocal GABAergic septo-hippocampal connection: wiring and dynamics of circuits underlying theta oscillation
		12:00 – 13:00			Early lunch
			Venki, TAs	AB	Student Projects
		13:00 – 15:00	Tomas, Suhasa, M. Dickinson	CD	In vivo patching/ Flight arena demo
		15:00 – 15:15			Coffee
			Venki, TAs	CD	Student Projects
		15:15 – 17:15	Tomas, Suhasa, M. Dickinson	AB	In vivo patching / Flight arena demo
		17:15 – 17:30			Coffee
		17:30 – 20:30	TAs		Student Projects
		20:30 – 21:30			Dinner
		21:00 – 23:00	TAs		Student Projects

17/6/2016	DAY 17	08:00 – 09:00			Morning run/swim
		09:00 – 10:00			Breakfast
		10:00 – 12:00			Group Experiments
		12:00 – 13:00			Lunch
		13:00 – 20:30			Group Experiments

20:30 – 21:30
21:00 – 23:00

Dinner
Group Experiments

18/6/2016 DAY 18

08:00 – 09:00
09:00 – 10:00
10:00 – 11:00
11:00 – 12:00
12:00 – 13:00
13:00 – 18:00
18:00 – 20:30
20:30 – 21:30
21:00 – 23:00

Raul Muresan

Running around
Breakfast
TBA : Oscillations and analysis techniques

Lunch
Group Experiments
Group Experiments
Dinner
Student presentations - group projects

19/6/2016 DAY 19

08:00 – 09:00
09:00 – 10:00

10:00 – 11:45

11:45 – 12:00
12:00 – 13:30
13:30 – 14:30
14:30 – 16:00
Evening onwards

Morning run/swim
Breakfast
Informal chalk board talks by students (10 + 5 minutes): Very brief
intro to current research work and defend future proposals to use
knowledge acquired at the course
Coffee
Informal chalk board talks by students continue
Lunch
Round up and feedback
Music, movies, swim and party
