

Time / Date	7:00 – 8:30	Lecture Session I 8:30 – 10:00	Exercise Session I 10:30 – 12:00	12:30 – 14:00	Lecture Session II 14:00 – 15:30	Exercise Session II 16:00 – 17:30	17:30 – 19:00	19:00 – ...	
6 Sep	ARRIVAL DAY 1						Free Time	Dinner *	
7 Sep	Break-fas	Mathematical Foundation 1 Kim Lefmann, Jakob Lass	Mathematical Foundation 2 Kim Lefmann, Jakob Lass	Lunch	Mathematical Foundation 3 Kim Lefmann, Jakob Lass	Mathematical Foundation 4 Kim Lefmann, Jakob Lass	Free Time	Dinner *	
8 Sep	Break-fas	Mathematical Foundation 5 Kim Lefmann, Jakob Lass	Mathematical Foundation 6 Kim Lefmann, Jakob Lass	Lunch	Solid State Physics Foundation Kim Lefmann, Jakob Lass	Magnetism Foundation Kim Lefmann, Jakob Lass	WELCOME RECEPTION		
ARRIVAL DAY 2									
9 Sep	Break-fast	Welcome to the School <ul style="list-style-type: none"> Practicals, Examination Process How to write a proposal (45 min) Safety at large-scale facilities Kim Lefmann, University of Copenhagen Martin Månsson, KTH	L0: Overview of the course <ul style="list-style-type: none"> The Neutron/scattering experiment Production / “Filters / Detection Elastic/Inelastic Brief overview of the techniques Martin Månsson, KTH	Lunch	L1: Intro <ul style="list-style-type: none"> Basic interaction mechanism (+x-rays) Scattering from 1 & 2 nuclei Coherent / Incoherent / Absorption Kim Lefmann, University of Copenhagen	Ex. 1 <ul style="list-style-type: none"> Scattering from 1 & 2 Nuclei Coherent / Incoherent 	Free Time	Dinner *	
10 Sep	Break-fast	L2: Neutron Sources & Instrumentation <ul style="list-style-type: none"> Sources Moderators Monochromators / choppers Collimation / Filters / Guides Detection Kim Lefmann, University of Copenhagen	Ex. 2 <ul style="list-style-type: none"> Build your virtual neutron instrument (e-learning)	Lunch	L3: Neutron Interaction with Matter <ul style="list-style-type: none"> Cross Section, Isotope Sensitivity Elastic / Inelastic X-rays/electrons Multiple Scattering Kim Lefmann, University of Copenhagen	Ex. 3 <ul style="list-style-type: none"> Cross Section Selection of materials^e (e-learning)	Free Time	Dinner *	
11 Sep	Break-fast	L4: Magnetic Scattering <ul style="list-style-type: none"> Magnetism Nuclear/Magnetic Scattering Kim Lefmann, University of Copenhagen	Ex. 4 <ul style="list-style-type: none"> Spin Structure (new e-learning)	Lunch	L5: Crystallography <ul style="list-style-type: none"> Crystallography k-space Brillouin Zone Nami Matsubara, KTH	Ex. 5 <ul style="list-style-type: none"> (e-learning) 	Free Time	Dinner *	
12 Sep	Break-fast	L6: Diffraction I <ul style="list-style-type: none"> Instrumentation Powder Neutron / x-rays Nami Matsubara, KTH	Ex. 6 <ul style="list-style-type: none"> Refinement Nami Matsubara, KTH	Lunch	L7: Diffraction II <ul style="list-style-type: none"> Laue, Single-crystal Total Scattering Nuclear / Magnetic Nami Matsubara, KTH	Ex. 7 Refinement (cont.) Nami Matsubara, KTH	Free Time	Dinner *	
13 Sep	Break-fast	FREE DAY / EXCURSION							Dinner *
14 Sep	Break-fast	L8: Reflectometry I <ul style="list-style-type: none"> Instrumentation Specular/off-specular Optical Matrix Kinematic Approximation Applications Adrian Rennie, Uppsala University	Ex. 8 <ul style="list-style-type: none"> Virtual reflectometry Optical matrix fits (e-learning)	Lunch	L9: Reflectometry II + GiSANS <ul style="list-style-type: none"> Distorted Born approximation GiSANS Instrumentation In plane / out of plane Applications Adrian Rennie, Uppsala University	Ex. 9 <ul style="list-style-type: none"> Biomembranes Contrast Variations Magnetism 	Free Time	GALA DINNER	

15 Sep	Break-fast	L10: Neutron Imaging <ul style="list-style-type: none"> Instrumentation Radiography / Tomography In operando Neutrons / x-rays Luise Theil Kuhn, DTU	Ex. 10 <ul style="list-style-type: none"> Virtual Imaging Experiment (e-learning)	Lunch	L11: SANS I <ul style="list-style-type: none"> Instrumentation2 Scattering Length Density Form-/Structure Factor Approximations Andrew Jackson, Lund University / ESS	Ex. 11 "Experiment" <ul style="list-style-type: none"> Virtual SANS experiment Resolution (wavelength vs. angle) Data Treatment (e-learning) 	Free Time	Dinner *	
16 Sep	Break-fast	L12: SANS II <ul style="list-style-type: none"> Geometrical models Contrast Variations Time-resolved / stroboscopic Applications Andrew Jackson, Lund University / ESS	Ex. 12 "Data Modeling" <ul style="list-style-type: none"> Spheres vs. cylinders Polydispersity Resolution + Magnetism !!! 	Lunch	L13: INS I "Intro" <ul style="list-style-type: none"> Instrumentations (TAS/ToF) Direct / Indirect geometry Pulsed/Continuous E/p conservation k-space (reminder) Examples (nuclear / magnetic) Kim Lefmann, University of Copenhagen	Ex. 13 <ul style="list-style-type: none"> Virtual INS experiment (e-learning)	Free Time	Dinner *	
17 Sep	Break-fast	L14: INS II "Nuclear" <ul style="list-style-type: none"> Phonons (basics) ω/τ domain Cross sections Applications Gediminas Simutis, Paul Scherrer Institute	L15: INS III "Magnetic" <ul style="list-style-type: none"> Spin waves Magnetic Cross Section Applications Kim Lefmann, University of Copenhagen	Lunch	Ex. 14 <ul style="list-style-type: none"> Modelling phonons/spin waves Extract J's Spin-W Simon Ward, ESS / DMSC Johan Hellsvik, NORDITA	Ex. 14 (continued) <ul style="list-style-type: none"> Modelling phonons/spin waves Extract J's Spin-W Simon Ward, ESS / DMSC Johan Hellsvik, NORDITA	Free Time	Dinner *	
18 Sep	Break-fast	L16: Polarized Neutron Scattering: BASICS <ul style="list-style-type: none"> Polarizing/Flipping/Detecting the neutron spin (theory & technologies) Basic theory Examples (Elastic & Inelastic) Werner Schweika, ESS	L17: QENS <ul style="list-style-type: none"> Instrumentation Energy/time-scales Coherent / Incoherent Diffusion, Molecular dynamics Cross section & Isotope labeling Mark Telling, STFC/ISIS	Lunch	Ex. 15 <ul style="list-style-type: none"> Polymer Dynamics (dynamics / diffusion) Isotope labeling Mark Telling, STFC/ISIS	Ex. 15 (continued) <ul style="list-style-type: none"> Polymer Dynamics (dynamics / diffusion) Isotope labeling Mark Telling, STFC/ISIS	Free Time	Dinner *	
19 Sep	Break-fast	L18: Keynote Lecture: "Challenge 1" Neutrons for Life Luke Clifton STFC / ISIS UK	L19: Keynote Lecture: "Challenge 2" Neutrons for Skyrmions Henrik Rønnow EPF Lausanne Switzerland	Lunch	L20-21: Keynote Lecture: "Challenge 3" Neutrons + Muons + X-rays for Sustainability (energy) Martin Månsson KTH Royal Institute of Technology Sweden		Free Time	End Dinner	
20 Sep	Break-fast	Help for Proposal Writing <ul style="list-style-type: none"> Proposal Writing "Workshop" Teachers + NNSP/SwedNess admin will be available 	L22: Key-Note Lecture: "ESS" Future Science at ESS Andreas Schreyer, ESS	Lunch	Help for Proposal Writing <i>(continued)</i>			Dinner *	
21 Sep	Break-fast	DEPARTURE DAY							

* Dinners during the normal lecture days are your own responsibility. SwedNess/NNSP are only organizing the "Welcome Reception", "Gala Dinner" and "End Dinner". Lunch is included.