

Time / Date	7:00 – 8:30	Lecture Session I 8:30 – 10:15	Exercise Session I 10:30 – 12:15	12:30 – 14:00	Lecture Session II 14:00 – 15:45	Exercise Session II 16:00 – 17:45	18:00 – 19:00	19:00 – ...
9 Sep	ARRIVAL DAY 1			Lunch	Mathematical Foundation 1 Kim Lefmann, Sidse Lolk & Johan Hellsvik	Mathematical Foundation 2 Kim Lefmann, Sidse Lolk & Johan Hellsvik	Free Time	Dinner
10 Sep	Mathematical Foundation 3 Kim Lefmann, Sidse Lolk & Johan Hellsvik	Mathematical Foundation 4 Kim Lefmann, Sidse Lolk & Johan Hellsvik	Lunch	Mathematical Foundation 5 Kim Lefmann, Sidse Lolk & Johan Hellsvik	Mathematical Foundation 6 Kim Lefmann, Sidse Lolk & Johan Hellsvik	WELCOME RECEPTION		
ARRIVAL DAY 2								
11 Sep	Break-fast	L1: Intro <ul style="list-style-type: none"> The Neutron Production / History / Future Basic interaction mechanism (also x-rays) Scattering from 1 & 2 nuclei Coherent / Incoherent Absorption Kim Lefmann	Ex. 1 <ul style="list-style-type: none"> Scattering from 1 & 2 Nuclei Coherent / Incoherent 	Lunch	L2: Neutron Sources & Instrumentation <ul style="list-style-type: none"> Sources Moderators Monochromators / choppers Collimation / Filters Guides Detection Kim Lefmann	Ex. 2 <ul style="list-style-type: none"> Build your virtual neutron instrument (e-learning)	Free Time	Dinner
12 Sep	Break-fast	L3: Neutron Interaction with Matter <ul style="list-style-type: none"> Cross Section Isotope Sensitivity Elastic / Inelastic Nuclear / Magnetic X-rays / Electrons Multiple Scattering Kim Lefmann	Ex. 3 <ul style="list-style-type: none"> Cross Section Selection of materials (e-learning)	Lunch	L4: Neutron Imaging <ul style="list-style-type: none"> Instrumentation Radiography Tomography In operando Neutrons / x-rays Luise Theil Kuhn	Ex. 4 <ul style="list-style-type: none"> Virtual Imaging Experiment (e-learning)	Free Time	Dinner
13 Sep	Break-fast	L5: Fourier Space <ul style="list-style-type: none"> Crystallography k-space Brillouin Zone Magnus Sørby	Ex. 5 <ul style="list-style-type: none"> (e-learning)	Lunch	L6: Diffraction I <ul style="list-style-type: none"> Instrumentation Powder Neutron / x-rays Magnus Sørby	Ex. 6 <ul style="list-style-type: none"> Refinement 	Free Time	Dinner
14 Sep	Break-fast	L7: Diffraction II <ul style="list-style-type: none"> Laue Single-crystal Total Scattering Nuclear / Magnetic Magnus Sørby	Ex. 7 <ul style="list-style-type: none"> Refinement (cont.) 	Lunch	L8: Magnetic Scattering <ul style="list-style-type: none"> Magnetism Magnetic Scattering TBA !	Ex. 8 <ul style="list-style-type: none"> Refinement (cont.) 	Free Time	Dinner
15 Sep	Break-fast	L9: SANS I <ul style="list-style-type: none"> Instrumentation Scattering Length Density Form-/Structure Factor Approximations Andrew Jackson	Ex. 9 "Experiment" <ul style="list-style-type: none"> Virtual SANS experiment Resolution (wavelength vs. angle) Data Treatment (e-learning)	Lunch	L10: SANS II <ul style="list-style-type: none"> Geometrical models Contrast Variations Time-resolved / stroboscopic Applications Andrew Jackson	Ex. 10 "Data Modeling" <ul style="list-style-type: none"> Spheres vs. cylinders Polydispersity Resolution 	Free Time	GALA DINNER

16 Sep		FREE DAY / EXCURSION							Dinner
17 Sep	Break-fast	L11: Reflectometry I <ul style="list-style-type: none"> Instrumentation Specular/off-specular Optical Matrix Kinematic Approximation Applications Adrian Rennie 🇬🇧	Ex. 11 <ul style="list-style-type: none"> Virtual reflectometry (TBA ???) Optical matrix fits (e-learning)	Lunch	L12: Reflectometry II + GiSANS <ul style="list-style-type: none"> Distorted Born approximation GiSANS Instrumentation In plane / out of plane Applications Adrian Rennie 🇬🇧	Ex. 12 <ul style="list-style-type: none"> Biomembranes Contrast Variations 	Free Time	Dinner	
18 Sep	Break-fast	L13: INS I "Nuclear" <ul style="list-style-type: none"> Instrumentations (TAS/ToF) E/p conservation k-space (reminder) Phonons (basics) ω/τ domain Cross sections Applications Kim Lefmann 🇩🇪	Ex. 13 <ul style="list-style-type: none"> Virtual INS experiment (e-learning)	Lunch	L14: INS II "Magnetic" <ul style="list-style-type: none"> Spin waves Magnetic Cross Section Applications Dan Huvonen 🇫🇮	Ex. 14 <ul style="list-style-type: none"> Modelling (2 tracks?) 	Free Time	Dinner	
19 Sep	Break-fast	L15: QENS I <ul style="list-style-type: none"> Instrumentation Energy/time-scales Coherent / Incoherent Diffusion Molecular dynamics Cross section Isotope labeling TBA !	Ex. 15 <ul style="list-style-type: none"> Polymer Dynamics (dynamics / diffusion) Isotope labeling 	Lunch	L16: QENS II + Spin Echo <ul style="list-style-type: none"> Instrumentation Applications TBA !	L17: Polarized Neutron Scattering <ul style="list-style-type: none"> Production, guiding and flipping Blume equations Uniaxial polarised neutron diffraction Vector polarisation analysis Neutron Depolarization Applications (soft and hard matter, elastic/inelastic etc.) TBA !	Free Time	Dinner	
20 Sep	Break-fast	L18: <u>Challenge 1</u> "Neutrons for Sustainability (energy)" Martin Månsson 🇸🇪	L19: <u>Challenge 2</u> "Neutrons for Industry" Magnus Hörnqvist Colliander (engineering) 🇸🇪	Lunch	L20: <u>Challenge 3</u> "Neutrons for Life" Jeremy H. Lakey 🇬🇧	L21: <u>Challenge 4</u> "Neutrons for Quantum Matter" TBA !	Free Time	Dinner	
21 Sep	Break-fast	<p style="text-align: center;">Exam</p> <ul style="list-style-type: none"> Proposal Writing Complimentary methods (or not)? Motivation Exercise brief reports? Methods (Diffraction, SANS, Reflectometry, INS, Imaging QENS) using template Examiners: Teaching Committee (NNSP & SwedNess)		Lunch	<p style="text-align: center;">Exam</p> <ul style="list-style-type: none"> Proposal Writing Complimentary methods (or not)? Motivation Exercise brief reports? Methods (Diffraction, SANS, Reflectometry, INS, Imaging QENS) using template Examiners: Teaching Committee (NNSP & SwedNess)	L22: Future Science at ESS <ul style="list-style-type: none"> ESS technologies & characteristics Instrument suite New opportunities Andreas Schreyer 🇦🇹	Free Time	END DINNER ???	
22 Sep	Break-fast	DEPARTURE DAY							