

(COURSE 1)	WEEK #1					
juas...	12 Jan. Monday	13 Jan. Tuesday	14 Jan. Wednesday	15 Jan. Thursday	16 Jan. Friday	
MORNING (From 08:45 to 12:00)		Transverse Beam Dynamics B. Holzer	Transverse Beam Dynamics B. Holzer	Transverse Beam Dynamics B. Holzer	Transverse Beam Dynamics B. Holzer	08:45 - 09:45
		Transverse Beam Dynamics B. Holzer	Transverse Beam Dynamics B. Holzer	Transverse Beam Dynamics B. Holzer	Transverse Beam Dynamics B. Holzer	09:45 - 10:45
		Transverse Beam Dynamics B. Holzer	Transverse Beam Dynamics B. Holzer	Transverse Beam Dynamics B. Holzer	Transverse Beam Dynamics B. Holzer	10:45 - 12:00
AFTERNOON (From 13:15 to 16:30, or more sometimes)	OFFICIAL OPENING (1/2): Presentation of ESI and JUAS <i>E. Métral, F. Mouthon, D. Baizhanova</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	12:00 - 13:15 13:15 - 14:15
	Particle Accelerators in the 21st century Seminar <i>M. Vretenar</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	14:15 - 15:15
	Hotel check-in	Longitudinal Beam Dynamics <i>A. Lasheen</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	15:15 - 16:30
	(16:30 - 18:30) Special relativity, electromagnetism, classical & quantum mechanics: What to remember for particle accelerators <i>E. Métral</i>	Introduction to CERN & its Accelerator Complex Seminar <i>(Under discussion with Oliver Bruning)</i>	Special session to check the software installations	Electron-positron circular colliders Seminar <i>J. Keintzel</i>		16:30 - 17:30
	(18:30 - 20:00) OFFICIAL OPENING (2/2): Introduction of students + ice breaking + apero <i>E. Métral, F. Mouthon, D. Baizhanova</i>					17:30 - 18:30 18:30 - 20:00

(COURSE 1)		WEEK #2				
juas... MORNING (From 08:45 to 12:00)	19 Jan. Monday	20 Jan. Tuesday	21 Jan. Wednesday	22 Jan. Thursday	23 Jan. Friday	
	Transverse Beam Dynamics (exam preparation) B. Holzer		Linacs D. Alesini	Linacs D. Alesini	Linacs D. Alesini	08:45 - 09:45
	Transverse Beam Dynamics (exam preparation) B. Holzer	Longitudinal Beam Dynamics (exam preparation) A. Lasheen	Linacs D. Alesini	Linacs D. Alesini	Linacs D. Alesini	09:45 - 10:45
	Introduction to MAD-X => Xsuite transverse N. Fuster Martinez	Longitudinal Beam Dynamics (exam preparation) A. Lasheen	Linacs D. Alesini	Linacs D. Alesini	Linacs D. Alesini	10:45 - 12:00
AFTERNOON (From 13:15 to 16:30, or more sometimes)						12:00 - 13:15
	MADX workshop => Xsuite transverse N. Fuster Martinez	GROUP1: Xsuite longitudinal workshop B. Salvant GROUP2: Longitudinal Beam Dynamics A. Lasheen	Transverse linear imperfections D. Gamba	Transverse linear imperfections D. Gamba	Transverse linear imperfections D. Gamba	13:15 - 14:15
	MADX workshop => Xsuite transverse N. Fuster Martinez		Transverse linear imperfections D. Gamba	Transverse linear imperfections D. Gamba	Transverse linear imperfections D. Gamba	14:15 - 15:15
	MADX workshop => Xsuite transverse N. Fuster Martinez	GROUP2: Xsuite longitudinal workshop B. Salvant GROUP1: Longitudinal Beam Dynamics A. Lasheen	Transverse linear imperfections D. Gamba	Transverse linear imperfections D. Gamba	Transverse linear imperfections D. Gamba	15:15 - 16:30
			Low-emittance lattices for large colliders Seminar Pantaleo Raimondi	IBS and Touschek Seminar Fanouria Antoniou		16:30 - 17:30

(COURSE 1)		WEEK #4										
juas		2 Feb. Monday		3 Feb. Tuesday		4 Feb. Wednesday		5 Feb. Thursday		6 Feb. Friday		
MORNING (From 08:45 to 12:00)	WRITTEN EXAMINATION 3/4 (09:00 - 11:00) Synchrotron Radiation	Collective effects (mainly space charge & instabilities) M. Migliorati and E. Chiadroni		Collective effects (mainly space charge & instabilities) M. Migliorati and E. Chiadroni		Collective effects (mainly space charge & instabilities) M. Migliorati and E. Chiadroni		ORAL EXAMINATION Accelerator design		08:45 - 09:45		
		Collective effects (mainly space charge & instabilities) M. Migliorati and E. Chiadroni		Collective effects (mainly space charge & instabilities) M. Migliorati and E. Chiadroni		Accelerator design Workshop A. Oeftiger				09:45 - 10:45		
		Collective effects (mainly space charge & instabilities) M. Migliorati and E. Chiadroni		Collective effects (mainly space charge & instabilities) M. Migliorati and E. Chiadroni		Accelerator design Workshop A. Oeftiger				10:45 - 12:00		
											12:00 - 13:15	
AFTERNOON (From 13:15 to 16:30, or more sometimes)		Accelerator design B. Härer		Accelerator design Workshop A. Oeftiger		Accelerator design Workshop A. Oeftiger		ORAL EXAMINATION Accelerator design		13:15 - 14:15		
		Accelerator design B. Härer		Accelerator design Workshop A. Oeftiger		Accelerator design Workshop A. Oeftiger				14:15 - 15:15		
			Accelerator design B. Härer		Accelerator design Workshop A. Oeftiger		Accelerator design Workshop A. Oeftiger		Accelerator design: Summary discussion A. Oeftiger et al.		15:15 - 16:30	
			Accelerator design Workshop A. Oeftiger		Accelerator design Workshop A. Oeftiger		Accelerator design Workshop A. Oeftiger		Electron microscopy and diffraction Seminar Simona Borelli		16:30 - 17:30	

(COURSE 1)		WEEK #5				
juas		9 Feb. Monday	10 Feb. Tuesday	11 Feb. Wednesday	12 Feb. Thursday	13 Feb. Friday
MORNING <i>(From 08:45 to 12:00)</i>	Collective effects (mainly space charge & instabilities) <i>M. Migliorati and E. Chiadroni</i>	Collective effects (mainly space charge & instabilities) <i>M. Migliorati and E. Chiadroni</i>		Full-day trip to ESRF (with J.L. Revol)	Free-Electron Lasers Seminar <i>E. Prat Costa</i>	08:45 - 09:45
	Collective effects (mainly space charge & instabilities) <i>M. Migliorati and E. Chiadroni</i>	Collective effects (mainly space charge & instabilities) <i>M. Migliorati and E. Chiadroni</i>			Beam cooling Seminar <i>Chris Rogers</i>	09:45 - 10:45
	Collective effects (mainly space charge & instabilities) <i>M. Migliorati and E. Chiadroni</i>	GROUP1: CST-Xsuite case study <i>D. Amorim and S. Joly</i> GROUP2: Collective effects <i>M. Migliorati</i>			CLOSING SESSION Course 1 + Goodbye Apero	10:45 - 12:00
						12:00 - 13:15
AFTERNOON <i>(From 13:15 to 16:30, or more sometimes)</i>	Injection / Extraction <i>N. Carmignani</i>	GROUP2: CST-Xsuite case study <i>D. Amorim and S. Joly</i> GROUP1: Collective effects <i>M. Migliorati</i>		Full-day trip to ESRF (with J.L. Revol)		13:15 - 14:15
	Injection / Extraction <i>N. Carmignani</i>	Plasma Wakefield Acceleration <i>Massimo Ferrario</i>	WRITTEN EXAMINATION 4/4 (14:15 - 16:15) <u>All the other lectures</u>			14:15 - 15:15
	Injection / Extraction <i>N. Carmignani</i>	Plasma Wakefield Acceleration <i>Massimo Ferrario</i>				15:15 - 16:30
	Novel High Gradient Particle Accelerators Seminar <i>R. Assmann</i>	Plasma Wakefield Acceleration <i>Massimo Ferrario</i>				16:30 - 17:30

(COURSE 2)	WEEK #6					
juas...	16 Feb. Monday	17 Feb. Tuesday	18 Feb. Wednesday	19 Feb. Thursday	20 Feb. Friday	
MORNING (From 08:45 to 12:00)		Introduction to RF A. Mostacci	Introduction to RF A. Mostacci	RF Engineering C. Vollinger, M. Wendt	RF Engineering C. Vollinger, M. Wendt	08:45 - 09:45
		Introduction to RF A. Mostacci	RF Engineering C. Vollinger, M. Wendt	RF Engineering C. Vollinger, M. Wendt	RF Engineering C. Vollinger, M. Wendt	09:45 - 10:45
		Introduction to RF A. Mostacci	RF Engineering C. Vollinger, M. Wendt	RF Engineering C. Vollinger, M. Wendt	RF Engineering C. Vollinger, M. Wendt	10:45 - 12:00
						12:00 - 13:15
AFTERNOON (From 13:15 to 16:30, or more sometimes)	OFFICIAL OPENING (1/2): Presentation of ESI and JUAS E. Métral, F. Mouthon, D. Baizhanova	Normal Conducting Magnets <u>INTRODUCTION</u> (Lect. #1) T. Zickler	Normal Conducting Magnets <u>MAGNET CONSTRUCTION</u> (Lect. #4) T. Zickler	Normal Conducting Magnets <u>CASE STUDY INTRODUCTION</u> (Lect. #7) J. Bauche, T. Zickler	Normal Conducting Magnets <u>CASE STUDY #2</u> (by sub-groups #6) J. Bauche, T. Zickler	13:15 - 14:15
	Particle accel., instruments of discovery in physics (Seminar) P. Lebrun	Normal Conducting Magnets <u>BASIC PRINCIPLES</u> (Lect. #2) T. Zickler	Normal Conducting Magnets <u>ANALYTICAL DESIGN</u> (Lect. #5) T. Zickler	Normal Conducting Magnets <u>CASE STUDY #1</u> (by sub-groups #6) J. Bauche, T. Zickler	Normal Conducting Magnets <u>CASE STUDY #3</u> (by sub-groups #6) J. Bauche, T. Zickler	14:15 - 15:15
	Hotel check-in	Normal Conducting Magnets <u>MAGNET TYPES</u> (Lect. #3) T. Zickler	Normal Conducting Magnets <u>NUMERICAL DESIGN</u> (Lect. #6) T. Zickler	Normal Conducting Magnets <u>CASE STUDY #1 (Cont'd)</u> (by sub-groups #6) J. Bauche, T. Zickler	Normal Conducting Magnets <u>CASE STUDY #4</u> (by sub-groups #6) J. Bauche, T. Zickler	15:15 - 16:30
	(16:30 - 17:30) Some reminders E. Métral			The US Electron-Ion collider (Zoom) Seminar T. Satogata		16:30 - 17:30
	(17:30 - 18:30) Introduction to CERN practical days Magnet / SC / RF / Vacuum / CLEAR J. Bauche, J. Fleiter, M. Wendt, V. Baglin, R. Corsini, P. Korysko					17:30 - 18:30
	(18:30 - 20:00) OFFICIAL OPENING (2/2): Introduction of students + ice breaking + apero E. Métral, F. Mouthon, D. Baizhanova					18:30 - 20:00

(COURSE 2)	WEEK #7				
juas...	23 Feb. Monday	24 Feb. Tuesday	25 Feb. Wednesday	26 Feb. Thursday	27 Feb. Friday
MORNING (From 08:45 to 12:00)	RF Engineering C. Vollinger, M. Wendt	RF Engineering (exam preparation) C. Vollinger, M. Wendt	Superconducting RF Cavities S. Calatroni (or someone one else)	Superconducting magnets P. Ferracin	Superconducting magnets P. Ferracin
	RF Engineering C. Vollinger, M. Wendt	RF Engineering (exam preparation) C. Vollinger, M. Wendt	Superconducting RF Cavities S. Calatroni (or someone one else)	Superconducting magnets P. Ferracin	Superconducting magnets P. Ferracin
	Normal Conducting Magnets <u>CASE STUDY</u> (Oral presentation by group/students) J. Bauche, T. Zickler	Cryogenics for Superconducting devices P. Lebrun	Vacuum systems V. Baglin	Superconducting magnets P. Ferracin	Superconducting magnets P. Ferracin
AFTERNOON (From 13:15 to 16:30, or more sometimes)	Normal Conducting Magnets <u>CASE STUDY</u> (Oral presentation by group/students) J. Bauche, T. Zickler	Superconductivity (intro): From solid state physics to technical materials Luca Bottura	Vacuum systems V. Baglin	Superconducting magnets P. Ferracin	Superconducting magnets (exam preparation) P. Ferracin
	Normal Conducting Magnets <u>TUTORIAL</u> J. Bauche, T. Zickler	Superconductivity (intro): From solid state physics to technical materials Luca Bottura	Vacuum systems V. Baglin	Vacuum systems V. Baglin	Vacuum systems V. Baglin
	Normal Conducting Magnets <u>TUTORIAL</u> J. Bauche, T. Zickler	Superconducting RF Cavities S. Calatroni (or someone one else)	Vacuum systems V. Baglin	Vacuum systems V. Baglin	Vacuum systems V. Baglin
			Future high-energy linear colliders Seminar P. Burrows	Muon Colliders & associated technological challenges Seminar L. Bottura	

(COURSE 2)		WEEK #8									
juas		2 Mar. Monday		3 Mar. Tuesday		4 Mar. Wednesday		5 Mar. Thursday		6 Mar. Friday	
MORNING <i>(From 08:45 to 12:00)</i>	WRITTEN EXAMINATION 1/4 (09:00 - 11:00) <u>RF Engineering</u>		Particle Sources <i>T. Thuillier</i>		Particle Sources <i>T. Thuillier</i>		Beam instrumentation <i>P. Forck</i>		Beam instrumentation <i>P. Forck</i>		08:45 - 09:45
			Particle Sources <i>T. Thuillier</i>		High Power Proton Linacs <i>M. Eshraqi</i>		Beam instrumentation <i>P. Forck</i>		Beam instrumentation P. Forck		09:45 - 10:45
			Particle Sources <i>T. Thuillier</i>		High Power Proton Linacs <i>M. Eshraqi</i>		Beam instrumentation <i>P. Forck</i>		Beam instrumentation <i>P. Forck</i>		10:45 - 12:00
12:00 - 13:15											
AFTERNOON <i>(From 13:15 to 16:30, or more sometimes)</i>			Visits at CERN (LINAC4 with Alessandra Lombardi and Jean-Baptiste Lallement; AD and ELENA with Christian Carli, Davide Gamba, Francois Butin and Fritz Caspers; CLEAR with Pierre Korysko and Wilfrid Farabolini; Thin film coating facilities with Bernard Henrist, Maria Carmen Giordano, Pedro Costa Pinto, Wilhelmus Vollenberg, Yorick Maxence Delaup)		Beam instrumentation <i>P. Forck</i>		Visit & Experimental work at Bergoz Instrumentation E. Touzain		Beam instrumentation <i>P. Forck</i>		13:15 - 14:15
	WRITTEN EXAMINATION 2/4 (14:15 - 16:15) <u>Magnets</u> <u>(Normal & Superconducting)</u> + report <u>for NC</u> from students to be given before (prep. for exam)				Beam instrumentation <i>P. Forck</i>				Beam instrumentation (exam preparation) <i>P. Forck</i>		14:15 - 15:15
					Beam instrumentation <i>P. Forck</i>				Beam instrumentation (exam preparation) <i>P. Forck</i>		15:15 - 16:30
					Energy recovery linacs Seminar <i>M. Arnold</i>						16:30 - 17:30
											17:30 - 18:00
				C2 APERO ALUMNI						18:00 - 19:30	

(COURSE 2)	WEEK #9					
juas...	9 Mar. Monday	10 Mar. Tuesday	11 Mar. Wednesday	12 Mar. Thursday	13 Mar. Friday	
MORNING (From 08:45 to 12:00)	WRITTEN EXAMINATION 3/4 (09:00 - 11:00) <u>Beam instrumentation</u>	Practical days at CERN RF / SC / VACUUM / MAGNET / CLEAR	Practical days at CERN RF / SC / VACUUM / MAGNET / CLEAR	Low Energy Accelerators <i>W. Mondelaers</i>	Acc. for medical & industrial applications <i>E. Vanderkraaij</i>	08:45 - 09:45
		Practical days at CERN RF / SC / VACUUM / MAGNET / CLEAR	Practical days at CERN RF / SC / VACUUM / MAGNET / CLEAR	Low Energy Accelerators <i>W. Mondelaers</i>	Acc. for medical & industrial applications <i>E. Vanderkraaij</i>	09:45 - 10:45
		Practical days at CERN RF / SC / VACUUM / MAGNET / CLEAR	Practical days at CERN RF / SC / VACUUM / MAGNET / CLEAR	Radiation safety <i>X. Queralt</i>	Survey and Alignment of Accelerators <i>J-C. Gayde</i>	10:45 - 12:00
AFTERNOON (From 13:15 to 16:30, or more sometimes)	Networking event	Practical days at CERN RF / SC / VACUUM / MAGNET / CLEAR	Practical days at CERN RF / SC / VACUUM / MAGNET / CLEAR	Radiation safety <i>X. Queralt</i>	Survey and Alignment of Accelerators <i>J-C. Gayde</i>	12:00 - 13:15
		Practical days at CERN RF / SC / VACUUM / MAGNET / CLEAR	Practical days at CERN RF / SC / VACUUM / MAGNET / CLEAR	Radiation safety => Simulations <i>X. Queralt</i>	Energy and sustainability for particle accelerators <i>S. Claudet</i>	13:15 - 14:15
		Practical days at CERN RF / SC / VACUUM / MAGNET / CLEAR	Practical days at CERN RF / SC / VACUUM / MAGNET / CLEAR	Radiation safety => Simulations <i>X. Queralt</i>	Energy and sustainability for particle accelerators <i>S. Claudet</i>	14:15 - 15:15
						15:15 - 16:30

(COURSE 2)		WEEK #10					
		16 Mar. Monday	17 Mar. Tuesday	18 Mar. Wednesday	19 Mar. Thursday	20 Mar. Friday	
MORNING (From 08:45 to 12:00)		ORAL EXAMINATION Practical days @CERN	WRITTEN EXAMINATION 4/4 (09:00 - 11:00) <u>All the other lectures</u>	Trip to PSI (for 2 days)	Visit of PSI with R. Ischebeck. Lectures on accelerator controls (Elke Zimoch) and ProScan + Some seminars	Accelerator driven system Seminar <i>Adrian Fabich or Ulrich Dorda</i>	08:45 - 09:45
						AWAKE Seminar <i>E. Gschwendtner</i>	09:45 - 10:45
						CLOSING SESSION Course 2 + Goodbye Apero	10:45 - 12:00
AFTERNOON (From 13:15 to 16:30, or more sometimes)			Visit to Geneva Hospital with 1 seminar (see below)	Visit of PSI with R. Ischebeck. Lectures on accelerator controls (Elke Zimoch) and ProScan + Some seminars	Trip back from PSI		12:00 - 13:15
							13:15 - 14:15
							14:15 - 15:15
			Radiation Oncology: Biology, Physics & Clinical Applications (Seminar) <i>A. Durham</i>				15:15 - 16:30
							16:30 - 17:30
							18:30 - 19:30