JUAS 2023 - PROGRAM

(COURSE 1)

WEEK #1

	9 Jan. **Monday**	10 Jan. **Tuesday**	11 Jan. **Wednesday**	12 Jan. **Thursday**	13 Jan. **Friday**
MORNING *(From 9:00 to 12:00)*		**Transverse Beam Dynamics** B. Holzer	**Transverse Beam Dynamics** B. Holzer	**Transverse Beam Dynamics** B. Holzer	**Transverse Beam Dynamics** B. Holzer
		Transverse Beam Dynamics B. Holzer	**Transverse Beam Dynamics** B. Holzer	**Transverse Beam Dynamics** B. Holzer	**Transverse Beam Dynamics** B. Holzer
	OFFICIAL OPENING: Presentation of JUAS & Introduction of students *E. Metral, B. Holland, S. Vandergooten*	**Transverse Beam Dynamics** B. Holzer	**Transverse Beam Dynamics** B. Holzer	**Transverse Beam Dynamics** B. Holzer	**Transverse Beam Dynamics** B. Holzer
AFTERNOON (From 13:30 onwards)	**Special relativity, electromagnetism, classical and quantum mechanics: What to remember for particle accelerators** *E. Metral*	**Longitudinal Beam Dynamics** *A. Lasheen*	**Longitudinal Beam Dynamics** *A. Lasheen*	**Longitudinal Beam Dynamics** *A. Lasheen*	**Longitudinal Beam Dynamics** *A. Lasheen*
		Longitudinal Beam Dynamics *A. Lasheen*	**Longitudinal Beam Dynamics** *A. Lasheen*	**Longitudinal Beam Dynamics** *A. Lasheen*	**Longitudinal Beam Dynamics** *A. Lasheen*
	Particle Accelerators in the 21st century Seminar *M. Vretenar*	**Longitudinal Beam Dynamics** *A. Lasheen*	**Longitudinal Beam Dynamics** *A. Lasheen*	**Longitudinal Beam Dynamics** *A. Lasheen*	**Longitudinal Beam Dynamics** *A. Lasheen*
	CHECK-IN AT THE RESIDENCE & SHOPPING FOR GROCERIES	**Introduction to CERN & its Accelerator Complex** Seminar *R. Alemany*			

(COURSE 1)

WEEK #2

juas

	16 Jan. **Monday**	17 Jan. **Tuesday**	18 Jan. **Wednesday**	19 Jan. **Thursday**	20 Jan. **Friday**
MORNING *(From 9:00 to 12:00)*	**Introduction to MAD-X** *N. Fuster Martinez*	**Introduction to PyHeadTail** *B. Salvant*	**PyHeadTail workshop** *B. Salvant*	**Linacs** *D. Alesini*	**Linacs** *D. Alesini*
	Transverse Beam Dynamics **(exam preparation)** B. Holzer	**Longitudinal Beam Dynamics** **(exam preparation)** *A. Lasheen*	**PyHeadTail workshop** *B. Salvant*	**Linacs** *D. Alesini*	**Linacs** *D. Alesini*
	Transverse Beam Dynamics **(exam preparation)** B. Holzer	**Longitudinal Beam Dynamics** **(exam preparation)** *A. Lasheen*	**PyHeadTail workshop** *B. Salvant*	**Linacs** *D. Alesini*	**Linacs** *D. Alesini*
AFTERNOON (From 13:30 onwards)	**MADX workshop** *N. Fuster Martinez*	**MADX workshop** *N. Fuster Martinez*	**Linacs** *D. Alesini*	**Transverse linear imperfections** *D. Gamba*	**Transverse linear imperfections** *D. Gamba*
	MADX workshop *N. Fuster Martinez*	**MADX workshop** *N. Fuster Martinez*	**Linacs** *D. Alesini*	**Transverse linear imperfections** *D. Gamba*	**Transverse linear imperfections** *D. Gamba*
	MADX workshop *N. Fuster Martinez*	**MADX workshop** *N. Fuster Martinez*	**Transverse linear imperfections** *D. Gamba*	**Transverse linear imperfections** *D. Gamba*	**Transverse linear imperfections** *D. Gamba*
			Transverse linear imperfections *D. Gamba*		

JUAS 2023 - PROGRAM

(COURSE 1)

WEEK #3

	23 Jan. **Monday**	24 Jan. **Tuesday**	25 Jan. **Wednesday**	26 Jan. **Thursday**	27 Jan. **Friday**
MORNING (From 9:00 to 12:00)	**WRITTEN EXAMINATION** **Transverse beam dynamics**	**Cyclotrons & FFAs** *B. Jacquot*	**Synchrotron Radiation** *R. Ischebeck*	**Synchrotron Radiation** *R. Ischebeck*	**Synchrotron Radiation** *R. Ischebeck*
		Cyclotrons & FFAs *B. Jacquot*	**Synchrotron Radiation** *R. Ischebeck*	**Synchrotron Radiation** *R. Ischebeck*	**Synchrotron Radiation** *R. Ischebeck*
	WRITTEN EXAMINATION **Longitudinal beam dynamics**	**Cyclotrons & FFAs** *B. Jacquot*	**Synchrotron Radiation** *R. Ischebeck*	**Synchrotron Radiation** *R. Ischebeck*	**Synchrotron Radiation** **(exam preparation)** *R. Ischebeck*
AFTERNOON (From 13:30 onwards)	**Trip to CERN**	**Dedicated session on COLLIDERS** 1) Electron-positron circular colliders (J. Keintzel) **2**) LHC & HL-LHC *(O. Brüning / M. Giovannozzi)* *3) FCC-hh (M. Giovannozzi)* *4) Nuclear collisions at the LHC (J. Jowett)* 5) The US Electron-Ion Collider *(T. Satogata)* *6) Future high-energy linear colliders (P. Burrows)* 7) Muon collider *(D. Schulte)*	**Synchrotron Radiation** *R. Ischebeck*	**Synchrotron Radiation** *R. Ischebeck*	**Synchrotron Radiation** **(exam preparation)** *R. Ischebeck*
	Visit of the CERN LEIR accelerator *N. Biancacci*		**Cyclotrons & FFAs** *B. Jacquot*	**Transverse nonlinear effects** *H. Bartosik*	**Transverse nonlinear effects** *H. Bartosik*
	Drink at CERN		**Cyclotrons & FFAs** *B. Jacquot*	**Transverse nonlinear effects** *H. Bartosik*	**Transverse nonlinear effects** *H. Bartosik*
	Visit to ALICE experiment at the CERN LHC *J. Jowett*		**Cyclotrons & FFAs** *B. Jacquot*	**Transverse nonlinear effects** *H. Bartosik*	**Transverse nonlinear manipulations** Seminar *M. Giovannozzi*
	Intro on Colliders (for tomorrow's afternoon session on Collider) Seminar E. *Métral*				
	Dinner at CERN				

(COURSE 1)

WEEK #4

juas

	30 Jan. **Monday**	31 Jan. **Tuesday**	1 Feb. **Wednesday**	2 Feb. **Thursday**	3 Feb. **Friday**
MORNING *(From 9:00 to 12:00)*	**Injection / Extraction** *N. Carmignani*	**Accelerator design** *B. Härer*	**Collective effects (mainly space charge & instabilities)** *M. Migliorati*	**Collective effects (mainly space charge & instabilities)** *M. Migliorati*	**Collective effects (mainly space charge & instabilities)** *M. Migliorati*
	Injection / Extraction *N. Carmignani*	**Accelerator design** *B. Härer*	**Collective effects (mainly space charge & instabilities)** *M. Migliorati*	**Collective effects (mainly space charge & instabilities)** *M. Migliorati*	**Collective effects (mainly space charge & instabilities)** *M. Migliorati*
	Injection / Extraction *N. Carmignani*	**Accelerator design Workshop** *A. Oeftiger*	**Collective effects (mainly space charge & instabilities)** *M. Migliorati*	**Collective effects (mainly space charge & instabilities)** *M. Migliorati*	**Collective effects (mainly space charge & instabilities)** *M. Migliorati*
AFTERNOON (From 13:30 onwards)	**Free-Electron Lasers** Seminar *E. Prat Costa*	**Accelerator design Workshop** *A. Oeftiger*	**Collective effects (mainly space charge & instabilities)** *M. Migliorati*	**Collective effects (mainly space charge & instabilities)** *M. Migliorati*	**Collective effects (mainly space charge & instabilities)** *M. Migliorati*
	Accelerator design *B. Härer*	**Accelerator design Workshop** *A. Oeftiger*	**Beam-based impedance measurements** Seminar N. Biancacci	**Novel High Gradient Particle Accelerators** Seminar *R. Assmann*	**CERN LIU Project: Beam dynamics aspects & solutions** Seminar G. Rumolo
	Accelerator design *B. Härer*	**Accelerator design Workshop** *A. Oeftiger*	**Accelerator design Workshop** *A. Oeftiger*	**Accelerator design Workshop** *A. Oeftiger*	**Accelerator design Workshop** *A. Oeftiger*
	Accelerator design *B. Härer*	**Accelerator design Workshop** *A. Oeftiger*	**Accelerator design Workshop** *A. Oeftiger*	**Accelerator design Workshop** *A. Oeftiger*	**Accelerator design Workshop** *A. Oeftiger*

(COURSE 1)

WEEK #5

juas	6 Feb. **Monday**	7 Feb. **Tuesday**	8 Feb. **Wednesday**	9 Feb. **Thursday**	10 Feb. **Friday**
MORNING (From 9:00 to 12:00)	**PRIVATE STUDIES**	**PRIVATE STUDIES**	**PRIVATE STUDIES**	**Trip to ESRF**	**CHECK-OUT AT THE RESIDENCE**
	ORAL EXAMINATION **Accelerator design**		**WRITTEN EXAMINATION** **Subject 4 (TBA mid week 4)**	**Visit of ESRF:** **Intro, Scientific case & Facility** *J-L. Revol*	**I-FAST-CBI: Challenge based innovation for particle accelerators & related technologies** Seminar *N. Delerue*
					CLOSING SESSION **Course 1** **+ Final Drink & lunch**
AFTERNOON (From 13:30 onwards)	**ORAL EXAMINATION** **Accelerator design**	**WRITTEN EXAMINATION** **Synchrotron Radiation**	**PRIVATE STUDIES**	**Visit of ESRF:** **Intro, Scientific case & Facility** *J-L. Revol*	
				Visit of ESRF: **Control room & Beamline** *J-L. Revol*	
	Accelerator design: **Summary discussion** A. Oeftiger et al.	**PRIVATE STUDIES**	**WRITTEN EXAMINATION** **Subject 5 (TBA mid week 4)**	**Visit of ESRF:** **Control room & Beamline** *J-L. Revol*	

(COURSE 2)

WEEK #6

	13 Feb. **Monday**	14 Feb. **Tuesday**	15 Feb. **Wednesday**	16 Feb. **Thursday**	17 Feb. **Friday**
MORNING *(From 9:00 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*
		Introduction to RF *A. Mostacci*	**RF Engineering** C. Vollinger, *M. Wendt*	**RF Engineering** C. Vollinger, *M. Wendt*	**RF Engineering** C. Vollinger, *M. Wendt*
	Presentation of JUAS / ESI & Practical info *E. Metral, B. Holland, S. Vandergooten*	**Introduction to RF** *A. Mostacci*	**RF Engineering** C. Vollinger, *M. Wendt*	**RF Engineering** C. Vollinger, *M. Wendt*	**RF Engineering** C. Vollinger, *M. Wendt*
AFTERNOON (From 13:30 onwards)	**Particle accel., instruments of discovery in physics** (Seminar) *P. Lebrun*	**Normal Conducting Magnets** **INTRODUCTION (Lect. #1)** *T. Zickler*	**Normal Conducting Magnets** **MAGNET CONSTRUCTION (Lect. #4)** *T. Zickler*	**Normal Conducting Magnets** **CASE STUDY INTRODUCTION (Lect. #7)** *J. Bauche, T. Zickler*	**Normal Conducting Magnets** **CASE STUDY #2** (by sub-groups #6) *J. Bauche, T. Zickler*
	Introduction to CERN practical days Magnet, SC, RF, Vacuum, CLEAR *J. Bauche, J. Fleiter, F. Caspers, V. Baglin, R. Corsini*	**Normal Conducting Magnets** **BASIC PRINCIPLES (Lect. #2)** *T. Zickler*	**Normal Conducting Magnets** **ANALYTICAL DESIGN (Lect. #5)** *T. Zickler*	**Normal Conducting Magnets** **CASE STUDY #1** (by sub-groups #6) *J. Bauche, T. Zickler*	**Normal Conducting Magnets** **CASE STUDY #3** (by sub-groups #6) *J. Bauche, T. Zickler*
	CHECK-IN AT THE RESIDENCE & SHOPPING FOR GROCERIES	**Normal Conducting Magnets** **MAGNET TYPES (Lect. #3)** *T. Zickler*	**Normal Conducting Magnets** **NUMERICAL DESIGN (Lect. #6)** *T. Zickler*	**Normal Conducting Magnets** **CASE STUDY #1 (Cont'd)** (by sub-groups #6) *J. Bauche, T. Zickler*	**Normal Conducting Magnets** **CASE STUDY #4** (by sub-groups #6) *J. Bauche, T. Zickler*

(COURSE 2)

WEEK #7

	20 Feb. **Monday**	21 Feb. **Tuesday**	22 Feb. **Wednesday**	23 Feb. **Thursday**	24 Feb. **Friday**
MORNING *(From 9:00 to 12:00)*	**RF Engineering** C. Vollinger, *M. Wendt*	**RF Engineering** C. Vollinger, *M. Wendt*	**Superconducting RF Cavities** *F. Caspers*	**Vacuum systems** V. Baglin & R. Kersevan	**Vacuum systems** V. Baglin & R. Kersevan
	RF Engineering C. Vollinger, *M. Wendt*	**RF Engineering** **(exam preparation)** C. Vollinger, *M. Wendt*	**Superconducting RF Cavities** *F. Caspers*	**Vacuum systems** V. Baglin & R. Kersevan	**Vacuum systems** V. Baglin & R. Kersevan
	RF Engineering C. Vollinger, *M. Wendt*	**RF Engineering** **(exam preparation)** C. Vollinger, *M. Wendt*	**Materials for SCRF cavities: Beyond niobium** *(Seminar)* *S. Calatroni*	**Vacuum systems** V. Baglin & R. Kersevan	**Vacuum systems** V. Baglin & R. Kersevan
AFTERNOON (From 13:30 onwards)	**Normal Conducting Magnets** **CASE STUDY** **(Oral presentation by group/students)** *J. Bauche, T. Zickler*	**Superconductivity (intro):** **RF vs. magnets** *C. Antoine*	**Vacuum systems** V. Baglin & R. Kersevan	**Superconducting magnets** *P. Ferracin*	**Superconducting magnets** *P. Ferracin*
	Normal Conducting Magnets **CASE STUDY** **(Oral presentation by group/students)** *J. Bauche, T. Zickler*	**Superconductivity (intro):** **RF vs. magnets** *C. Antoine*	**Vacuum systems** V. Baglin & R. Kersevan	**Superconducting magnets** *P. Ferracin*	**Superconducting magnets** *P. Ferracin*
	Normal Conducting Magnets **TUTORIAL** *J. Bauche, T. Zickler*	**Superconductivity (intro):** **RF vs. magnets** *C. Antoine*	**Vacuum systems** V. Baglin & R. Kersevan	**Superconducting magnets** *P. Ferracin*	**Superconducting magnets** *P. Ferracin*
	Normal Conducting Magnets **TUTORIAL** *J. Bauche, T. Zickler*	**Cryogenics for Superconducting devices** *P. Lebrun*	**Vacuum systems** V. Baglin & R. Kersevan	**Superconducting magnets** *P. Ferracin*	**Superconducting magnets** **(exam preparation)** *P. Ferracin*

(COURSE 2)

WEEK #8

juas

	27 Feb. **Monday**	28 Feb. **Tuesday**	1 Mar. **Wednesday**	2 Mar. **Thursday**	3 Mar. **Friday**
MORNING (From 9:00 to 12:00)	**WRITTEN EXAMINATION** **RF Engineering**	**Beam instrumentation** *P. Forck*	**Beam instrumentation** *P. Forck*	**Beam instrumentation** *P. Forck*	**Beam instrumentation** *P. Forck*
	WRITTEN EXAMINATION **Magnets** **(Normal & Superconducting)** + report for NC from students to be given before (prep. for exam)	**Beam instrumentation** *P. Forck*	**Beam instrumentation** *P. Forck*	**Beam instrumentation** *P. Forck*	**Beam instrumentation** **P. Forck**
		Beam instrumentation *P. Forck*	**Beam instrumentation** *P. Forck*	**Beam instrumentation** *P. Forck*	**Beam instrumentation** *P. Forck*
AFTERNOON (From 13:30 onwards)	**Trip to CERN**	**Particle Sources** *T. Thuillier*	**Bench-impedance measurements & materials characterization** Seminar *N. Biancacci*	**Virtual visit & Experimental work at Bergoz Instrumentation** E. Touzain	**Beam instrumentation** **(exam preparation)** *P. Forck*
	Visit of LINAC4 *A. Lombardi, J-B. Lallement*	**Particle Sources** *T. Thuillier*	**Particle Sources** *T. Thuillier*	**Virtual visit & Experimental work at Bergoz Instrumentation** E. Touzain	**Beam instrumentation** **(exam preparation)** *P. Forck*
	(Drink at CERN)	**Particle Sources** *T. Thuillier*	**Particle Sources** *T. Thuillier*	**Virtual visit & Experimental work at Bergoz Instrumentation** E. Touzain	**Energy recovery linacs** Seminar *F. Schliessmann* ~~*M. Arnold*~~
	Visit of AD ELENA *C. Carli*	**Muon Colliders & associated technological challenges** Seminar *D. Schulte*	**Particle Sources** *T. Thuillier*	**Virtual visit & Experimental work at Bergoz Instrumentation** E. Touzain	
	Visit of **THIN FILM COATING FACILITIES** *P. Costa Pinto, W. Vollenberg*				
	(Diner at CERN)				

(COURSE 2)

WEEK #9

	6 Mar. **Monday**	7 Mar. **Tuesday**	8 Mar. **Wednesday**	9 Mar. **Thursday**	10 Mar. **Friday**
MORNING *(From 9:00 to 12:00)*	**Practical days at CERN** RF / SC / VACUUM / MAGNET (+CLEAR = TBC)	**Practical days at CERN** RF / SC / VACUUM / MAGNET (+CLEAR = TBC)	**High Power Proton Linacs** *M. Eshraqi*	**Low Energy Accelerators** *W. Mondelaers*	**Acc. for medical & industrial applications** *E. Vanderkraaij & J. Mandrillon*
	Practical days at CERN RF / SC / VACUUM / MAGNET (+CLEAR = TBC)	**Practical days at CERN** RF / SC / VACUUM / MAGNET (+CLEAR = TBC)	**High Power Proton Linacs** *M. Eshraqi*	**Low Energy Accelerators** *W. Mondelaers*	**Acc. for medical & industrial applications** *E. Vanderkraaij & J. Mandrillon*
	Practical days at CERN RF / SC / VACUUM / MAGNET (+CLEAR = TBC)	**Practical days at CERN** RF / SC / VACUUM / MAGNET (+CLEAR = TBC)	**High Power Proton Linacs** *M. Eshraqi*	**Low Energy Accelerators** *W. Mondelaers*	**Acc. for medical & industrial applications** *E. Vanderkraaij & J. Mandrillon*
AFTERNOON (From 13:30 onwards)	**Practical days at CERN** RF / SC / VACUUM / MAGNET (+CLEAR = TBC)	**Practical days at CERN** RF / SC / VACUUM / MAGNET (+CLEAR = TBC)	**Radiation safety** *X. Queralt*	**Survey and Alignment of Accelerators** *J-C. Gayde*	**Life-cycle and operability of particle accelerators** *S. Meyroneinc*
	Practical days at CERN RF / SC / VACUUM / MAGNET (+CLEAR = TBC)	**Practical days at CERN** RF / SC / VACUUM / MAGNET (+CLEAR = TBC)	**Radiation safety** *X. Queralt*	**Survey and Alignment of Accelerators** *J-C. Gayde*	**Life-cycle and operability of particle accelerators** *S. Meyroneinc*
	Practical days at CERN RF / SC / VACUUM / MAGNET (+CLEAR = TBC)	**Practical days at CERN** RF / SC / VACUUM / MAGNET (+CLEAR = TBC)	**Radiation safety** *X. Queralt*	**Survey and Alignment of Accelerators** *J-C. Gayde*	**Life-cycle and operability of particle accelerators** *S. Meyroneinc*
			Accelerator driven system Seminar *F. Bouly*		

(COURSE 2)

WEEK #10

	13 Mar. **Monday**	14 Mar. **Tuesday**	15 Mar. **Wednesday**	16 Mar. **Thursday**	17 Mar. **Friday**
MORNING (From 9:00 to 12:00)	**ORAL EXAMINATION** **Practical days @CERN**	**PRIVATE STUDIES**	**WRITTEN EXAMINATION** **Subject 5 (TBA mid week 9)**	**Visit of PSI** **- SLS presentation & tour**	**CHECK-OUT AT THE RESIDENCE**
	ORAL EXAMINATION **Practical days @CERN**	**WRITTEN EXAMINATION** **Beam instrumentation**	**Trip to PSI**		**CLOSING SESSION** **Course 2** **+ Final Drink & lunch**
	ORAL EXAMINATION **Practical days @CERN**				
AFTERNOON (From 13:30 onwards)	**Trip to Geneva Hospital**	**PRIVATE STUDIES**	**Trip to PSI**	**Visit of PSI** **- SwissFEL presentation & tour** **- Accelerators controls (lecture)**	
	Visit to Geneva Hospital	**WRITTEN EXAMINATION** **Subject 4 (TBA mid week 9)**			
	Radiation Oncology: Biology, Physics & Clinical Applications (Seminar) *A. Durham*				
			ProScan presentation & tour at PSI	**Trip back from PSI**	