

JUAS 2022 - PROGRAM

(COURSE 1)

WEEK #1

	10 Jan. Monday	11 Jan. Tuesday	12 Jan. Wednesday	13 Jan. Thursday	14 Jan. Friday
MORNING	Presentation of JUAS / ESI & Practical info <i>E. Metral, B. Holland, S. Vandergooten</i>	Transverse Beam Dynamics B. Holzer	Transverse Beam Dynamics B. Holzer	Transverse Beam Dynamics B. Holzer	Transverse Beam Dynamics B. Holzer
	Presentation of participants (ice breaking activity) <i>TBC</i>	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	Introduction to MAD-X <i>N. Fuster Martinez</i>	Transverse Beam Dynamics B. Holzer
AFTERNOON	Special relativity, electromagnetism, classical and quantum mechanics: What to remember for particle accelerators <i>E. Metral</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	MADX workshop <i>N. Fuster Martinez</i>
		Longitudinal Beam Dynamics <i>A. Lasheen</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	MADX workshop <i>N. Fuster Martinez</i>
	Particle Accelerators in the 21st century Seminar <i>M. Vretenar</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	Introduction to CERN & its Accelerator Complex Seminar <i>R. Alemany</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	MADX workshop <i>N. Fuster Martinez</i>

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WEEK #2

	17 Jan.	18 Jan.	19 Jan.	20 Jan.	21 Jan.
	Monday	Tuesday	Wednesday	Thursday	Friday
MORNING	Longitudinal Beam Dynamics <i>A. Lasheen</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	PyHeadTail workshop <i>B. Salvant</i>	Transverse linear imperfections <i>H. Bartosik</i>	Transverse linear imperfections <i>H. Bartosik</i>
	Longitudinal Beam Dynamics <i>A. Lasheen</i>	Longitudinal Beam Dynamics <i>A. Lasheen</i>	PyHeadTail workshop <i>B. Salvant</i>	Transverse linear imperfections <i>H. Bartosik</i>	Transverse linear imperfections <i>H. Bartosik</i>
	Transverse Beam Dynamics <i>B. Holzer</i>	Introduction to PyHeadTail <i>B. Salvant</i>	PyHeadTail workshop <i>B. Salvant</i>	Transverse linear imperfections <i>H. Bartosik</i>	Transverse linear imperfections <i>H. Bartosik</i>
AFTERNOON	MADX workshop <i>N. Fuster Martinez</i>	Transverse Beam Dynamics (exam preparation) <i>B. Holzer</i>	Longitudinal Beam Dynamics (exam preparation) <i>A. Lasheen</i>	Linacs <i>D. Alesini</i>	Linacs <i>D. Alesini</i>
	MADX workshop <i>N. Fuster Martinez</i>	Transverse Beam Dynamics (exam preparation) <i>B. Holzer</i>	Longitudinal Beam Dynamics (exam preparation) <i>A. Lasheen</i>	Linacs <i>D. Alesini</i>	Linacs <i>D. Alesini</i>
	MADX workshop <i>N. Fuster Martinez</i>	Virtual visit of the CERN LEIR accelerator <i>N. Biancacci</i>	Virtual visit to ALICE experiment at the CERN LHC <i>J. Jowett</i>	Linacs <i>D. Alesini</i>	Linacs <i>D. Alesini</i>

JUAS 2022 - PROGRAM

(COURSE 1)

WEEK #3

	24 Jan.	25 Jan.	26 Jan.	27 Jan.	28 Jan.
	Monday	Tuesday	Wednesday	Thursday	Friday
MORNING	WRITTEN EXAMINATION <u>Transverse beam dynamics</u>	Linacs <i>D. Alesini</i>	Linacs <i>D. Alesini</i>	Synchrotron Radiation <i>R. Ischebeck</i>	Synchrotron Radiation <i>R. Ischebeck</i>
		Synchrotron Radiation <i>R. Ischebeck</i>	Synchrotron Radiation <i>R. Ischebeck</i>	Synchrotron Radiation <i>R. Ischebeck</i>	Synchrotron Radiation <i>R. Ischebeck</i>
		Synchrotron Radiation <i>R. Ischebeck</i>	Synchrotron Radiation <i>R. Ischebeck</i>	Synchrotron Radiation <i>R. Ischebeck</i>	Synchrotron Radiation (exam preparation) <i>R. Ischebeck</i>
AFTERNOON		Transverse linear imperfections <i>H. Bartosik</i>	Transverse nonlinear effects <i>H. Bartosik</i>	Synchrotron Radiation <i>R. Ischebeck</i>	Synchrotron Radiation (exam preparation) <i>R. Ischebeck</i>
	Dedicated session on COLLIDERS 0) Intro 1) LHC & future high-energy circular colliders (<i>O. Bruning / M. Giovannozzi</i>) 2) Electron-positron circular colliders (<i>F. Zimmermann</i>) 3) Future high-energy linear colliders (<i>L. Rinolfi</i>) 4) The US Electron-Ion Collider (<i>T. Satogata</i>) 5) Muon collider (<i>D. Schulte</i>)	Transverse linear imperfections <i>H. Bartosik</i>	Transverse nonlinear effects <i>H. Bartosik</i>	Accelerator design <i>B. Härer</i>	Accelerator design <i>B. Härer</i>
		Transverse nonlinear effects <i>H. Bartosik</i>	Transverse nonlinear effects <i>H. Bartosik</i>	Accelerator design <i>B. Härer</i>	Accelerator design <i>B. Härer</i>
		Transverse nonlinear effects <i>H. Bartosik</i>	Transverse nonlinear manipulations Seminar <i>M. Giovannozzi</i>	Accelerator design <i>B. Härer</i>	Accelerator design <i>B. Härer</i>

JUAS 2022 - PROGRAM

(COURSE 1)

WEEK #4

	31 Jan.	1 Feb.	2 Feb.	3 Feb.	4 Feb.
	Monday	Tuesday	Wednesday	Thursday	Friday
MORNING	Collective effects (mainly space charge & instabilities) <i>M. Migliorati</i>	Collective effects (mainly space charge & instabilities) <i>M. Migliorati</i>	Collective effects (mainly space charge & instabilities) <i>M. Migliorati</i>	Collective effects (mainly space charge & instabilities) <i>M. Migliorati</i>	Virtual visit ESRF: Intro, Scientific case & Facility <i>J-L. Revol</i>
	Collective effects (mainly space charge & instabilities) <i>M. Migliorati</i>	Collective effects (mainly space charge & instabilities) <i>M. Migliorati</i>	Collective effects (mainly space charge & instabilities) <i>M. Migliorati</i>	Collective effects (mainly space charge & instabilities) <i>M. Migliorati</i>	Virtual visit ESRF: Control room & Beamline <i>J-L. Revol</i>
	Collective effects (mainly space charge & instabilities) <i>M. Migliorati</i>	Collective effects (mainly space charge & instabilities) <i>M. Migliorati</i>	Collective effects (mainly space charge & instabilities) <i>M. Migliorati</i>	Collective effects (mainly space charge & instabilities) <i>M. Migliorati</i>	
AFTERNOON	Accelerator design Workshop <i>A. Oeftiger</i>	Accelerator design Workshop <i>A. Oeftiger</i>	Accelerator design Workshop <i>A. Oeftiger</i>	Accelerator design Workshop <i>A. Oeftiger</i>	Accelerator design Workshop <i>A. Oeftiger</i>
	Accelerator design Workshop <i>A. Oeftiger</i>	Accelerator design Workshop <i>A. Oeftiger</i>	Accelerator design Workshop <i>A. Oeftiger</i>	Accelerator design Workshop <i>A. Oeftiger</i>	Accelerator design Workshop <i>A. Oeftiger</i>
	Nuclear collisions at the LHC Seminar <i>J. Jowett</i>	Beam-based impedance measurements Seminar <i>N. Biancacci</i>	Novel High Gradient Particle Accelerators Seminar <i>R. Assmann</i>	CERN LIU Project: Beam dynamics aspects & solutions Seminar <i>G. Rumolo</i>	Accelerator design Workshop <i>A. Oeftiger</i>

JUAS 2022 - PROGRAM

(COURSE 1)

WEEK #5

	7 Feb.	8 Feb.	9 Feb.	10 Feb.	11 Feb.	
	Monday	Tuesday	Wednesday	Thursday	Friday	
MORNING	ORAL EXAMINATION Accelerator design	Cyclotrons & FFAs <i>B. Jacquot</i>	Injection / Extraction <i>N. Carmignani</i>	WRITTEN EXAMINATION <u>Synchrotron Radiation</u>	WRITTEN EXAMINATION <u>Subject 5 (TBA mid week 4)</u>	
	ORAL EXAMINATION Accelerator design	Cyclotrons & FFAs <i>B. Jacquot</i>	Injection / Extraction <i>N. Carmignani</i>			
	ORAL EXAMINATION Accelerator design	Cyclotrons & FFAs <i>B. Jacquot</i>	Injection / Extraction <i>N. Carmignani</i>	WRITTEN EXAMINATION <u>Subject 4 (TBA mid week 4)</u>	CLOSING SESSION - Course 1 -	
AFTERNOON	ORAL EXAMINATION Accelerator design	Cyclotrons & FFAs <i>B. Jacquot</i>				
	Free-Electron Lasers Seminar <i>E. Prat Costa</i>	Cyclotrons & FFAs <i>B. Jacquot</i>				
		Cyclotrons & FFAs <i>B. Jacquot</i>				

JUAS 2022 - PROGRAM

(COURSE 2)

WEEK #6

	14 Feb. Monday	15 Feb. Tuesday	16 Feb. Wednesday	17 Feb. Thursday	18 Feb. Friday
MORNING	Presentation of JUAS / ESI & Practical info <i>E. Metral, B. Holland, S. Vandergooten</i>	Introduction to RF <i>A. Mostacci</i>	Introduction to RF <i>A. Mostacci</i>	RF Engineering <i>C. Vollinger, M. Wendt, F. Caspers, M. Bozzolan</i>	RF Engineering <i>C. Vollinger, M. Wendt, F. Caspers, M. Bozzolan</i>
	Presentation of participants (ice breaking activity) <i>TBC</i>	Introduction to RF <i>A. Mostacci</i>	RF Engineering <i>C. Vollinger, M. Wendt, F. Caspers, M. Bozzolan</i>	RF Engineering <i>C. Vollinger, M. Wendt, F. Caspers, M. Bozzolan</i>	RF Engineering <i>C. Vollinger, M. Wendt, F. Caspers, M. Bozzolan</i>
		Introduction to RF <i>A. Mostacci</i>	RF Engineering <i>C. Vollinger, M. Wendt, F. Caspers, M. Bozzolan</i>	RF Engineering <i>C. Vollinger, M. Wendt, F. Caspers, M. Bozzolan</i>	RF Engineering <i>C. Vollinger, M. Wendt, F. Caspers, M. Bozzolan</i>
AFTERNOON	Particle accel., instruments of discovery in physics (Seminar) <i>P. Lebrun</i>	Normal Conducting Magnets <u>INTRODUCTION</u> (Lect. #1) <i>J. Bauche, L. Fiscarelli, T. Zickler</i>	Normal Conducting Magnets <u>MAGNET CONSTRUCTION</u> (Lect. #4) <i>J. Bauche, L. Fiscarelli, T. Zickler</i>	Normal Conducting Magnets <u>CASE STUDY INTRODUCTION</u> (Lect. #7) <i>J. Bauche, L. Fiscarelli, T. Zickler</i>	Normal Conducting Magnets <u>CASE STUDY #3</u> <i>(by sub-groups #6)</i> <i>J. Bauche, L. Fiscarelli, T. Zickler</i>
	Introduction to CERN practical days Magnet, Vacuum & RF <i>J. Bauche, V. Baglin, F. Caspers</i>	Normal Conducting Magnets <u>BASIC PRINCIPLES</u> (Lect. #2) <i>J. Bauche, L. Fiscarelli, T. Zickler</i>	Normal Conducting Magnets <u>ANALYTICAL DESIGN</u> (Lect. #5) <i>J. Bauche, L. Fiscarelli, T. Zickler</i>	Normal Conducting Magnets <u>CASE STUDY #1</u> <i>(by sub-groups #6)</i> <i>J. Bauche, L. Fiscarelli, T. Zickler</i>	Normal Conducting Magnets <u>CASE STUDY #4</u> <i>(by sub-groups #6)</i> <i>J. Bauche, L. Fiscarelli, T. Zickler</i>
		Normal Conducting Magnets <u>MAGNET TYPES</u> (Lect. #3) <i>J. Bauche, L. Fiscarelli, T. Zickler</i>	Normal Conducting Magnets <u>NUMERICAL DESIGN</u> (Lect. #6) <i>J. Bauche, L. Fiscarelli, T. Zickler</i>	Normal Conducting Magnets <u>CASE STUDY #2 (Q&A session)</u> <i>J. Bauche, L. Fiscarelli, T. Zickler</i>	Normal Conducting Magnets <u>CASE STUDY #5</u> <i>(by sub-groups #6)</i> <i>J. Bauche, L. Fiscarelli, T. Zickler</i>

JUAS 2022 - PROGRAM

(COURSE 2)

WEEK #7

	21 Feb.	22 Feb.	23 Feb.	24 Feb.	25 Feb.
	Monday	Tuesday	Wednesday	Thursday	Friday
MORNING	RF Engineering C. Vollinger, M. Wendt, F. Caspers, M. Bozzolan	RF Engineering C. Vollinger, M. Wendt, F. Caspers, M. Bozzolan	Superconducting RF Cavities F. Caspers	Vacuum systems V. Baglin & R. Kersevan	Vacuum systems V. Baglin & R. Kersevan
	RF Engineering C. Vollinger, M. Wendt, F. Caspers, M. Bozzolan	RF Engineering (exam preparation) C. Vollinger, M. Wendt, F. Caspers, M. Bozzolan	Superconducting RF Cavities F. Caspers	Vacuum systems V. Baglin & R. Kersevan	Vacuum systems V. Baglin & R. Kersevan
	RF Engineering C. Vollinger, M. Wendt, F. Caspers, M. Bozzolan	RF Engineering (exam preparation) C. Vollinger, M. Wendt, F. Caspers, M. Bozzolan	Vacuum systems V. Baglin & R. Kersevan	Vacuum systems V. Baglin & R. Kersevan	Vacuum systems V. Baglin & R. Kersevan
AFTERNOON	Normal Conducting Magnets CASE STUDY (Oral presentation by group/students) J. Bauche, L. Fiscarelli, T. Zickler	Superconductivity (intro): RF vs. magnets C. Antoine	Vacuum systems V. Baglin & R. Kersevan	Vacuum systems V. Baglin & R. Kersevan	Vacuum systems V. Baglin & R. Kersevan
	Normal Conducting Magnets CASE STUDY (Oral presentation by group/students) J. Bauche, L. Fiscarelli, T. Zickler	Superconductivity (intro): RF vs. magnets C. Antoine	Superconducting magnets P. Ferracin	Superconducting magnets P. Ferracin	Materials for SCRF cavities: Beyond niobium (Seminar) S. Calatroni
	Normal Conducting Magnets CASE STUDY (Oral presentation by group/students) J. Bauche, L. Fiscarelli, T. Zickler	Superconductivity (intro): RF vs. magnets C. Antoine	Superconducting magnets P. Ferracin	Superconducting magnets P. Ferracin	Superconducting magnets P. Ferracin
	Normal Conducting Magnets TUTORIAL J. Bauche, L. Fiscarelli, T. Zickler	Cryogenics for Superconducting devices P. Lebrun	Superconducting magnets P. Ferracin	Superconducting magnets P. Ferracin	Superconducting magnets (exam preparation) P. Ferracin

JUAS 2022 - PROGRAM

(COURSE 2)

WEEK #8

	28 Feb.	1 March	2 March	3 March	4 March
	Monday	Tuesday	Wednesday	Thursday	Friday
MORNING	WRITTEN EXAMINATION RF Engineering	Beam instrumentation <i>P. Forck</i>	Beam instrumentation <i>P. Forck</i>	Beam instrumentation <i>P. Forck</i>	Beam instrumentation <i>P. Forck</i>
	WRITTEN EXAMINATION Magnets (Normal & Superconducting) + report for NC from students to be given before (prep. for exam)	Beam instrumentation <i>P. Forck</i>	Beam instrumentation <i>P. Forck</i>	Beam instrumentation <i>P. Forck</i>	Beam instrumentation <i>P. Forck</i>
		Beam instrumentation <i>P. Forck</i>	Beam instrumentation <i>P. Forck</i>	Beam instrumentation <i>P. Forck</i>	Beam instrumentation <i>P. Forck</i>
AFTERNOON	Visit to CERN LINAC4 <i>A. Lombardi, J-B. Lallement</i>	Particle Sources <i>T. Thuillier</i>	Particle Sources <i>T. Thuillier</i>	Virtual visit & Experimental work at Bergoz Instrumentation	Particle Sources <i>T. Thuillier</i>
	Visit to CERN AD ELENA <i>C. Carli</i>	Particle Sources <i>T. Thuillier</i>	Particle Sources <i>T. Thuillier</i>	Virtual visit & Experimental work at Bergoz Instrumentation	Particle Sources <i>T. Thuillier</i>
	Visit to CERN THIN FILM COATING FACILITIES <i>P. Costa Pinto, W. Vollenberg</i>	Muon Colliders & associated technological challenges Seminar <i>D. Schulte</i>	Bench-impedance measurements & materials characterization Seminar <i>N. Biancacci</i>	Virtual visit & Experimental work at Bergoz Instrumentation	Energy recovery linacs Seminar <i>M. Arnold</i>

JUAS 2022 - PROGRAM

(COURSE 2)

WEEK #9

	7 March	8 March	9 March	10 March	11 March
	Monday	Tuesday	Wednesday	Thursday	Friday
MORNING	Practical days at CERN RF / VACUUM / MAGNET	Practical days at CERN RF / VACUUM / MAGNET	Acc. for medical & industrial applications <i>E. Vanderkraaij & J. Mandrillon</i>	Low Energy Electron Accelerators <i>W. Mondelaers</i>	High Power Proton Linacs <i>S. Bousson</i>
	Practical days at CERN RF / VACUUM / MAGNET	Practical days at CERN RF / VACUUM / MAGNET	Acc. for medical & industrial applications <i>E. Vanderkraaij & J. Mandrillon</i>	Low Energy Electron Accelerators <i>W. Mondelaers</i>	High Power Proton Linacs <i>S. Bousson</i>
	Practical days at CERN RF / VACUUM / MAGNET	Practical days at CERN RF / VACUUM / MAGNET	Acc. for medical & industrial applications <i>E. Vanderkraaij & J. Mandrillon</i>	Low Energy Electron Accelerators <i>W. Mondelaers</i>	High Power Proton Linacs <i>S. Bousson</i>
AFTERNOON	Practical days at CERN RF / VACUUM / MAGNET	Practical days at CERN RF / VACUUM / MAGNET	Radiation Oncology: Biology, Physics & Clinical Applications (Seminar) <i>A. Durham</i>	Survey and Alignment of Accelerators <i>J-C. Gayde</i>	Radiation safety <i>X. Queralt</i>
	Practical days at CERN RF / VACUUM / MAGNET	Practical days at CERN RF / VACUUM / MAGNET	Beam instrumentation (exam preparation) <i>P. Forck</i>	Survey and Alignment of Accelerators <i>J-C. Gayde</i>	Radiation safety <i>X. Queralt</i>
	Practical days at CERN RF / VACUUM / MAGNET	Practical days at CERN RF / VACUUM / MAGNET	Beam instrumentation (exam preparation) <i>P. Forck</i>	Survey and Alignment of Accelerators <i>J-C. Gayde</i>	Radiation safety <i>X. Queralt</i>

JUAS 2022 - PROGRAM

(COURSE 2)

WEEK #10

	14 March	15 March	16 March	17 March	18 March
	Monday	Tuesday	Wednesday	Thursday	Friday
MORNING	ORAL EXAMINATION Practical days @CERN	Virtual visit to PSI <i>R. Ischebeck</i>	Life-cycle and operability of particle accelerators <i>S. Meyroneinc</i>	WRITTEN EXAMINATION Beam instrumentation	WRITTEN EXAMINATION Subject 5 (TBA mid week 9)
	ORAL EXAMINATION Practical days @CERN	Virtual visit to PSI <i>R. Ischebeck</i>	Life-cycle and operability of particle accelerators <i>S. Meyroneinc</i>		
	ORAL EXAMINATION Practical days @CERN	PSI: Accelerator Controls <i>E. Zimoch</i>	Life-cycle and operability of particle accelerators <i>S. Meyroneinc</i>	WRITTEN EXAMINATION Subject 4 (TBA mid week 9)	CLOSING SESSION - Course 2 -
AFTERNOON	ORAL EXAMINATION Practical days @CERN	PSI: ProScan Introduction <i>JM. Schippers</i>			
	Accelerator driven system Seminar <i>F. Bouly</i>	PSI: Machine learning Seminar <i>J. Snuverink</i>			
		PSI: Dielectric laser accelerators Seminar <i>B. Hermann</i>			