Eighth International Accelerator School for Linear Colliders – Curriculum (v.4, 12/03/2013)

December 4 – 15, 2013, Rixos Hotel, Antalya, Turkey

Hosted by the Institute of Accelerator Technologies (IAT) of Ankara University

Daily Schedule

Breakfast	07:30 – 09:00
Morning	09:00 – 12:30, including ½-hour break
Lunch	12:30 – 14:00
Afternoon	14:00 – 17:30, including ½-hour break
Tutorial & homework	17:30 – 18:30
Dinner	19:00 – 20:00
Tutorial & homework	20:00 – 22:00

List of Courses (black: required, red and blue: elective)

	Morning	Afternoon	Evening
December 4		*Arrival, registration*	*Reception*
December 5	Introduction to physics & future accelerators	ILC	Tutorial & homework
December 6	CLIC	Joint lecture: Linac basics	Tutorial & homework
December 7	Joint lecture: Instrumentation basics	Course A: Accelerator physics Course B: Accelerator technology	Tutorial & homework
December 8	Course A: Accelerator physics Course B: Accelerator technology	*Excursion*	Tutorial & homework
December 9	Course A: Accelerator physics Course B: Accelerator technology		Tutorial & homework
December 10	Course A: Accelerator physics Course B: Accelerator technology		Tutorial & homework
December 11	Course A: Accelerator physics Course B: Accelerator technology	*Excursion*	Tutorial & homework
December 12	Course A: Accelerator physics Course B: Accelerator technology		Tutorial & homework
December 13	Course A: Accelerator physics Course B: Accelerator technology		Tutorial & homework
December 14	Course A: Accelerator physics Course B: Accelerator technology	*Study time*	Study time
December 15	Final exam	*Free time*	*Banquet;* *Student Award Ceremony*
December 16	*Departure*		

Program

	Thursday, December 5	Friday, December 6	Saturday, December 7	Sunday, December 8
Morning 09:00 – 12:30	**Inauguration** **Welcome – *O Yavas (IAT)*** **Introduction – *W Chou*** *(Fermilab)* **Lecture I1 – Introduction** (3 hrs) ***Masao Kuriki*** *(Hiroshima Univ.)* • Tera scale physics • Overview of future accelerators for Tera scale physics (ILC, CLIC, muon collider, γγ collider, LHeC, TLEP, new acceleration technologies)	**Lecture I3 – CLIC** (3 hrs) ***Frank Tecker*** *(CERN)* • Klystron vs. beam driven acceleration • CLIC layout • Parameter choices & optimization • Driver beam stability • Comparison of the CLIC and ILC • Technical challenges	**Joint lecture AB2 – Instrumentation basics** (3 hrs) ***Hermann Schmickler*** *(CERN)*	**Course A: Accelerator physics** **Lecture A1 – Linac** (cont'd) ***Daniel Schulte*** *(CERN)* **Course B: Accelerator technology** **Lecture B1 – Room temperature RF** (cont'd) ***Walter Wuensch*** *(CERN)*
Afternoon 14:00 – 17:30	**Lecture I2 – ILC** (3 hrs) ***Masao Kuriki*** *(Hiroshima Univ.)* • e- and e+ sources • Bunch compressors and spin rotators • Damping rings • Main linac • Beam delivery system • Civil construction issues	**Joint lecture AB1 – Linac basics** (3 hrs) ***Daniel Schulte*** *(CERN)*	**Course A: Accelerator physics** **Lecture A1 – Linac** (9 hrs) ***Daniel Schulte*** *(CERN)* **Course B: Accelerator technology** **Lecture B1 – Room temperature RF** (12 hrs) ***Walter Wuensch*** *(CERN)*	**Excursion**
Evening 19:00 – 22:00	Tutorial & homework	Tutorial & homework	Tutorial & homework	Tutorial & homework

Program (cont'd)

	Monday, December 9	Tuesday, December 10	Wednessday, December 11	Thursday, December 12
Morning 09:00 – 12:30	**Course A: Accelerator physics** **Lecture A1 – Linac** (cont'd) ***Daniel Schulte*** *(CERN)* **Course B: Accelerator technology** **Lecture B1 – Room temperature RF** (cont'd) ***Walter Wuensch*** *(CERN)*	**Course A: Accelerator physics** **Lecture A3a – Damping rings** (12 hrs) ***Yannis Papaphillipou*** *(CERN)* **Course B: Accelerator technology** **Lecture B1 – Room temperature RF** (cont'd) ***Walter Wuensch*** *(CERN)*	**Course A: Accelerator physics** **Lecture A3a – Damping rings** (cont'd) ***Yannis Papaphillipou*** *(CERN)* **Course B: Accelerator technology** **Lecture B2 – Superconducting RF** (cont'd) ***Takayuki Saeki*** *(KEK)*	**Course A: Accelerator physics** **Lecture A3a – Damping rings** (cont'd) ***Yannis Papaphillipou*** *(CERN)* **Course B: Accelerator technology** **Lecture B2 – Superconducting RF** (cont'd) ***Takayuki Saeki*** *(KEK)*
Afternoon 14:00 – 17:30	**Course A: Accelerator physics** **Lecture A2 – Sources** (6 hrs) ***Masao Kuriki*** *(Hiroshima Univ.)* **Course B: Accelerator technology** **Lecture B2 – Superconducting RF** (12 hrs) ***Takayuki Saeki*** *(KEK)*	**Course A: Accelerator physics** **Lecture A2 – Sources** (cont'd) ***Masao Kuriki*** *(Hiroshima Univ.)* **Course B: Accelerator technology** **Lecture B2 – Superconducting RF** (cont'd) ***Takayuki Saeki*** *(KEK)*	**Excursion**	**Course A: Accelerator physics** **Lecture A3a – Damping rings** (cont'd) ***Yannis Papaphillipou*** *(CERN)* **Course B: Accelerator technology** **Lecture B3 – Instrumentation** (3 hrs) ***Hermann Schmickler*** *(CERN)*
Evening 19:00 – 22:00	Tutorial & homework	Tutorial & homework	Tutorial & homework	Tutorial & homework

	Friday, December 13	Saturday, December 14	Sunday, December 15	Monday, December 16
Morning 09:00 – 12:30	**Course A: Accelerator physics** **Lecture A3b – Ring colliders** (3 hrs) ***Yannis Papaphillipou*** *(CERN)* **Course B: Accelerator technology** **Lecture B4 – LLRF & high power RF** (9 hrs) ***Stefan Simrock*** *(ITER)* ***Zheqiao Geng*** *(PSI)*	**Course A: Accelerator physics** **Lecture A4 – Beam delivery system and beam-beam** (cont'd) ***Andrei Seryi*** *(John Adams Inst.)* **Course B: Accelerator technology** **Lecture B4 – LLRF & high power RF** (cont'd) ***Stefan Simrock*** *(ITER)* ***Zheqiao Geng*** *(PSI)*	**08:00 – 12:30 Final exam** (4.5 hrs)	**Departure**
Afternoon 14:00 – 17:30	**Course A: Accelerator physics** **Lecture A4 – Beam delivery system and beam-beam** (6 hrs) ***Andrei Seryi*** *(John Adams Inst.)* **Course B: Accelerator technology** **Lecture B4 – LLRF & high power RF** (cont'd) ***Stefan Simrock*** *(ITER)* ***Zheqiao Geng*** *(PSI)*	**Study time**	*Free time*	
Evening 19:00 – 22:00	Tutorial & homework	Study time	Banquet at 19:00; Student Award Ceremony	

Notes on the Program:

1. There are a total of 11 school days in this year's program, excluding the arrival day (December 4) and the departure day (December 16). The time is divided as follows: 2-1/2 days for required courses, 6 days for elective courses, two 1/2 day for excursions, 1/2 day for study time and a final examination day.
2. The required course consists of five lectures: introduction, ILC, CLIC, linac basics and instrumentation basics. Every student must take this course.
3. There are two elective courses: Course A (the red course) is accelerator physics, Course B (the blue course) is accelerator technology. They will run in parallel. Each student will choose one of these.
4. The accelerator physics course consists of lectures on four topics: (1) linac, (2) sources, (3) damping rings and ring colliders, and (4) beam delivery system and beam-beam effects.
5. The accelerator technology course also consists of lectures on four topics: (1) room temperature RF, (2) superconducting RF, (3) instrumentation, and (4) LLRF and high power RF.
6. There will be homework assignments, but homework is not counted in the grade. There will be a final examination. Some of the exam problems will be taken from variations of the homework assignments. The exam papers will be graded immediately after the exam and results announced in the evening of December 15 at the student award ceremony.
7. There is a tutorial and homework period every evening. It is part of the curriculum and students are required to attend. Lecturers will be available in the evening of their lecture day during this period.
8. Lecturers have been asked to cover the basics as well as possible. Their teaching material will be made available online to the students ahead of time (a few weeks prior to the school). Students are strongly encouraged to study this material prior to the beginning of the school.
9. Lecturers of the elective courses are required to provide lecture syllabus as soon as possible in order to help students make their selection.
10. All lecturers are responsible for the design of homework and exam problems as well as the answer sheet. They are also responsible for grading the exams.
11. The award ceremony will honor the top (~10) students based on their exam scores.