

Selected topics in accelerator physics

Course duration 30 hours over 10 week. 1 term

Outline:

In this class we will go through the details of a modern synchrotron using SuperKEKB as an example. The course will follow the textbook *The Physics of Particle Accelerators* by Klaus Wille for the basics. Students will have to research literature on SuperKEKB with some guidance by themselves. The focus will be on the third chapter about linear beam optics. Students will work through the textbook by themselves. For each session, exercises and questions will be provided beforehand. These will be discussed with the instructor on the whiteboard in weekly sessions. The sessions will be scheduled based on instructor and student availability. **This part of the assessment will account for 40% of the final mark.**

Students will present a research paper of their own choice. **This part of the assessment will account for 20% of the final mark.**

Students will choose a research project which which will include a literature research and a simulation or experimental component. **20% of the final mark will be given for a presentation on this project and 20% for a written report.**

TIMELINE:

Week 1 – Chapter 1 Introduction + Discussion of Research Project

Week 2 – Chapter 2 Synchrotron Radiation

Week 3 – Chapter 3 Linear Beam Optics

Week 4 – Chapter 3 Linear Beam Optics

Week 5 – Chapter 3 Linear Beam Optics

Week 6 and 7 – Two selected chapters from the book based on students' interest and chosen project.

Week 8 – Report on Progress on Research Project

Week 9 – Report on Progress on Research Project

Week 10 – Presentation of research project