

Course Package

Fields & Waves

Name module	Fields & Waves
Educational programme	BSc Advanced Technology
Period	First quartile of the second semester (Quarter 2A)
Study load	15 ECTS
Coordinator	E.M. Marsman

Fields & Waves			
Quarter 1A	Quarter 1B	Quarter 2A	Quarter 2B
		Electro- and Magnetostatics (9 EC)	
		Project Antenna (3 EC)	
		Finite Element Methods (3 EC)	

Required preliminary knowledge: -

Complex engineering problems – like describing a wing's airflow profile, or an electrical spool's magnetic field – require a mathematical description that employs vectors. In this module you will apply this vector mathematics in the field of electromagnetism. In order to do so you will have to get acquainted with Maxwell equations. In a Problem Based Learning style you will solve and discuss successive problems with a small group of students to get insight in electrostatics, magnetostatics and from that continue to the field of electrodynamics. This knowledge will have to be used in the project team for the design and realization of an antenna that works as well as possible within the 100 MHz range. To support the antenna design process the Finite Element Method is introduced, including the validation of a simulation.

In the last few years one week of this module was spend on an excursion to CERN to see large magnets of various designs at work. During this visit several problems associated with particle beam dynamics and magnet design and realization are made. Above all this trip provides insight in this international renowned institute.

The modules are tentative and subject to change. Please check [the website](#) regularly.