

University of Oulu
Degree structure diagram 2018 - 2019
Master's Programme in Electronics and Communications
Engineering, 120 ECTS credits

Code	Course name	Recommended timing			
		1. year		2. year	
		1. aut.	1.spring	2. aut	2. spring

Electronics design option					
Module of the option 33 ECTS					
All obligatory					
521401S	Electronics design II	6			
521405A	Electronic system Design	5			
521326S	Radio Engineering I	5			
521088S	Optoelectronics	5			
521423S	Embedded System Project		5		
521406S	Digital Techniques III		7		
Electronics design advanced module					
Min. 2 courses					
521435S	Electronics design III	6			
521453A	Operating systems		5		
521457A	Software Engineering		5		
521025S	Power Electronics		5		
521300S	Electronics Design and Construction Exercise			6	
521402S	Telecommunications Circuit Design			6	
521016A	Advanced practical training			3	
	Diploma thesis, maturity essay and seminar				30
	Optional courses	3	3	15	
		30	30	30	30

Electronics materials and components option					
Module of the option 40 ECTS					
All obligatory					
521401S	Electronics design II	6			
521124S	Sensors and Measuring Techniques	5			
521326S	Radio Engineering I	5			
521073S	Electroceramics and Intelligent Materials (<i>every second year</i>)	5		5	
521075S	Microelectronics Packaging Technologies		5		
521074S	Microelectronics and Micromechanics		5		
521225S	RF Components and Measurements		5		
521215S	Microelectronics Project		5		

Electronics materials and components advanced module					
Obligatory courses 20 ECTS					
521080S	X-Ray Diffraction	5*		5*	
521072S	Microsensors	5**		5**	
521079S	Introduction to Nanotechnology		5		
521016A	Advanced practical training		3		
521089S	Printed Electronics				5
	Diploma thesis, maturity essay and seminar				30
	Optional courses 37-42 ECTS				
*lectured alternate years (S2017, S2019)					
** lectured alternate years (S2018, S 2020)					

Recommended optional courses for the advanced module					
Electronics					
521435S	Electronics design III	6			
521405A	Electronic system Design	5			
521423S	Embedded System Project	5			
521406S	Digital Techniques III		7		
521300S	Electronics Design and Construction Exercise			6	
Telecommunications					
521435S	Electronics design III	6			
521388S	Antennas (even years)		5		
521386S	Radio Channels (odd years)		5		
521375S	Radio Engineering II		6		
521402S	Telecommunications Circuit Design			6	
Measuring techniques					
521096S	Measuring Systems	5			
521088S	Optoelectronics	5			
521094S	Optoelectronic Measurements		5		
521098S	Testing techniques of Electronics		5		
521115S	EMC Design				

Telecommunication option					
Module of the option 40 ECTS					
All obligatory					
031025A	Introduction to Optimization	5			
521321S	Elements of Information Theory and Coding	5			
521316S	Broadband Communications Systems	5			
521323S	Wireless Communications I	5			
521340S	Communication Networks I	5			

521348S	Statistical Signal Processing	5			
521324S	Communication Signal Processing I		5		
521385S	Mobile Telecommunication Systems		5		
Advanced module					
Obligatory courses 25 ECTS					
521377S	Communication Networks II		7		
521317S	Wireless Communications II		8		
521325S	Communication Signal Processing II		5		
521016A	Advanced practical training		3		
521326S	Radio Engineering I			5	
	Diploma thesis, maturity essay and seminar				30
	Optional courses			22	
		30	33	27	30

Radio engineering option					
Module of the option 41 ECTS					
All obligatory					
521316S	Broadband Communications Systems	5			
521401S	Electronics design II	6			
521323S	Wireless Communications I	5			
521326S	Radio Engineering I	5			
521348S	Statistical Signal Processing	5			
521225S	RF-komponentit ja mittaukset		5		
521324S	Communication Signal Processing I		5		
521405A	Electronic system Design			5	
Advanced module 28/29 ECTS					
All obligatory					
521435S	Electronics design III	6			
521388S 521386S	Antennas (even years) OR Radio Channels (odd years)		5		
521375S	Radio Engineering II		6		
521016A	Advanced practical training		3		
521402S	Telecommunications Circuit Design			6	
521322S	Telecommunication Engineering Project OR			5/6	
521300S	Electronics Design and Construction Exercise				
	Diploma thesis, maturity essay and seminar				30
	Optional courses		5/6	12/11	
		32	29/30	28/29	30

Photonics and measurement techniques option					
Module of the option 30 ECTS					
All obligatory					
521091S	Technical Optics	5			
521096S	Measuring Systems	5			
521401S	Electronics design II	6			
521088S	Optoelectronics	5			
521124S	Sensors and Measuring Techniques	5			
521097S	Wireless Measurements		5		
Advanced module A: Optical and electronic measuring techniques					
	Obligatory 15 ECTS				
521242A	Introduction to Biomedical Engineering	5			
521240S	Biofotoniikka ja biolääketieteellinen optiikka	5			
521093S	Biomedical instrumentation		5		
521094S	Optoelectronic Measurements		5		
521016A	Advanced practical training		3		
	Diploma thesis, maturity essay and seminar				30
	Optional courses		11	30	
		31	29	30	30
Advanced module B: Testing techniques and printed electronics					
	Obligatory 15 ECTS				
521089S	Printed Electronics		5		
521098S	Testing techniques of Electronics		5		
521079S	Introduction to Nanotechnology		5		
521016A	Advanced practical training		3		
	Diploma thesis, maturity essay and seminar				30
	Optional courses	4	7	30	
		30	30	30	30