



UNIVERSITY of OULU
OULUN YLIOPISTO

DEPARTMENT of COMMUNICATIONS ENGINEERING

WCE CURRICULUM CONTENT

MODULES & COURSES & TIMING

Admission Group 2017-2019

WCE Curriculum

- WCE curriculum is mainly organized by ITEE Faculty's
 - CWC Radio Technologies (CWC-RT) research unit
 - CWC Networks and Systems (CWC-NS) research unit
 - Circuit and Systems (CAS) research unit
- WCE study specialization options (can be chosen freely after admission in student's personal study plan):
 - Wireless Communications Engineering – Radio Access and Networks (WCE–RAN)
 - Wireless Communications Engineering – RF Engineering (WCE–RF)

WCE Contents

Basic WCE studies module (RAN: 40, RF: 41 ECTS)
Advanced WCE studies module (RAN: 25, RF: 31 ECTS)
Optional WCE studies module (RAN: ≥ 22 , RF: ≥ 15 ECTS)
Advanced practical training (3 ECTS)
Master's (Diploma) Thesis work (30 ECTS)
In total 120 ECTS

University of Oulu holds ECTS label certificate

ECTS = European Credit Transfer System, 1 credit 25-30 hours, 1 year ca. 60 credits

WCE Contents

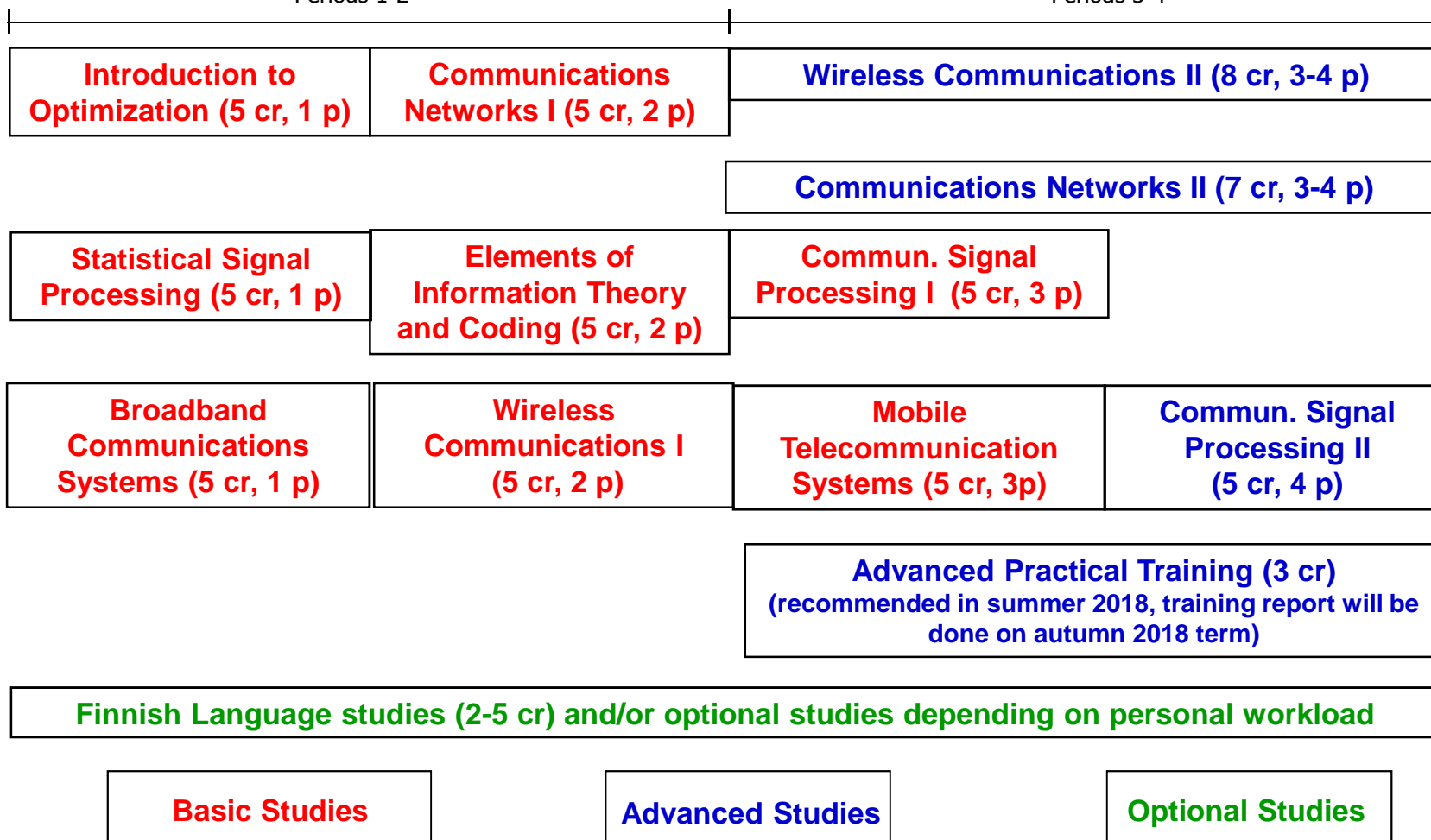
- WCE output: *R&D professionals specialized in wireless radio system design*
 - in RF engineering (RF option) or
 - in physical and network layers (radio access and networks RAN option)
- Learning outcomes of WCE M.Sc.(Tech.) graduates¹⁾:
 - Mathematics of optimization
 - Statistical signal processing
 - Communications signal processing
 - Information theory & coding methods
 - Communications network theory
 - Future radio access technologies (5G, etc.)
 - Mobile cellular communication systems design
 - Radio channels
 - Antenna & radio frequency engineering
 - Several computer engineering, DSP and multimedia subjects
 - Electronics design courses
 - Finnish language studies in order to integrate with Finnish society

¹⁾ Depending on the selected option and optional studies

WCE-RAN Schedule — 1st Year

Autumn 2017
Periods 1-2

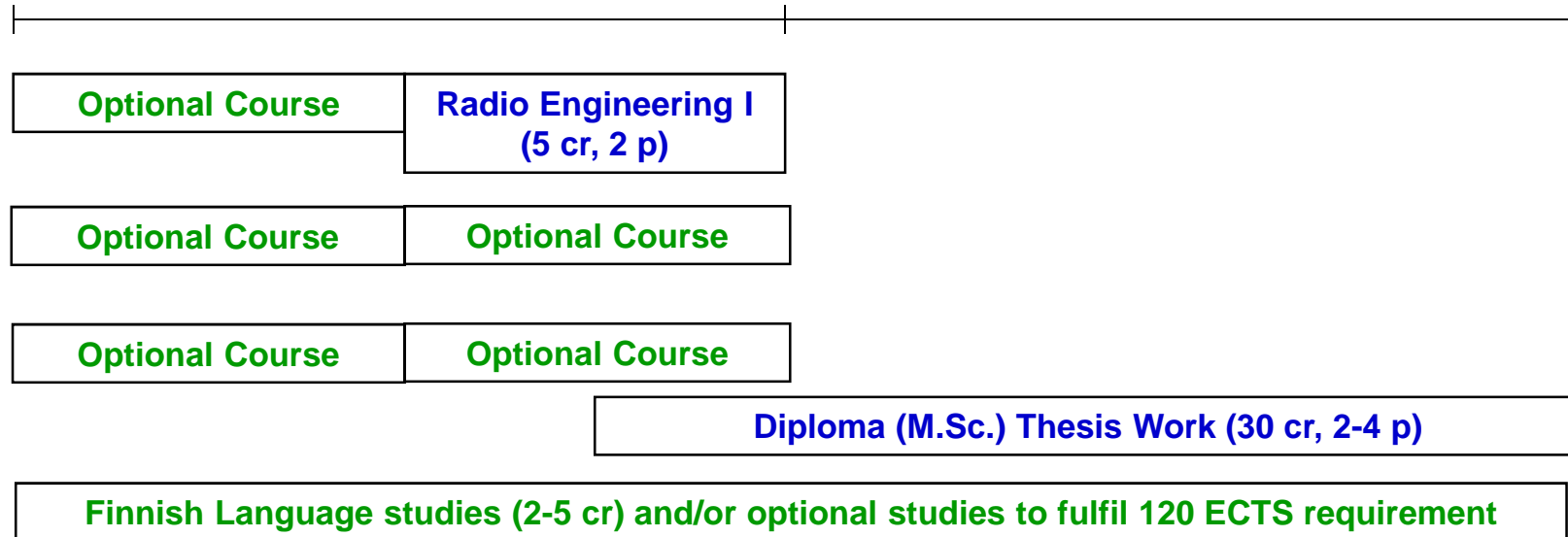
Spring 2018
Periods 3-4



WCE-RAN Schedule — 2nd Year

Autumn 2018
Periods 1-2

Spring 2019
Periods 3-4



Basic Studies

Advanced Studies

Optional Studies

WCE–RF Schedule — 1st Year

Autumn 2017
Periods 1-2

Spring 2018
Periods 3-4

Electronics Design II (6 cr, 1 p)	Electronics Design III (5 cr, 2 p)	Commun. Signal Processing I (5 cr, 3 p)	RF Components and Measurements (5 cr, 4 p)
Statistical Signal Processing (5 cr, 1 p)	Radio Engineering I (5 cr, 2 p)	Radio Engineering II (6 cr, 3 p)	Radio Channels (5 cr, 4 p) or Antennas (5 cr, 4 p) <small>(one of these is mandatory, one can be chosen as an optional study course)</small>
Broadband Communications Systems (5 cr, 1 p)	Wireless Communications I (5 cr, 2 p)		
		Optional Course	Optional Course
Advanced Practical Training (3 cr) <small>(recommended in summer 2018, training report will be done on autumn 2018 term)</small>			
Finnish Language studies (2-5 cr) and/or optional studies depending on personal workload			

Basic Studies

Advanced Studies

Optional Studies

WCE-RF Schedule — 2nd Year

Autumn 2018
Periods 1-2

Spring 2019
Periods 3-4

