International Master's Degree Programme in Wireless Communications Engineering (WCE), 2 years, 120 ECTS

| Basic WCE studies module (41 ECTS) |
| Advanced WCE studies module (33 ECTS) |
| Optional WCE studies module (≥13 ECTS) |
| Practical training (3 ECTS) |
| M.Sc. (Diploma) Thesis work (30 ECTS) |

In total 120 ECTS

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

**Basic Module, 41 ECTS, all courses obligatory**
- 031025A Introduction to Optimization, 5 ECTS
- 521321S Elements of Information Theory and Coding, 5 ECTS
- 521385S Mobile Telecommunication Systems, 5 ECTS
- 521320S Wireless Communications II, 8 ECTS
- 521340S Communication Networks I, 5 ECTS
- 521373S Communication Signal Processing I, 6 ECTS
- 521335S Radio Engineering I, 6 ECTS
- 521350S Seminar in Telecommunication and Radio Engineering, 1 ECTS

**Advanced Module, 33 ECTS, all courses obligatory**
- 521377S Communication Networks II, 7 ECTS
- 521375S Radio Engineering II, 5 ECTS
- 521317S Wireless Communications III, 8 ECTS
- 521360S Communication Signal Processing II, 4 ECTS
- 521380S Antennas, 4 ECTS
- 521386S Radio Channels, 5 ECTS

**Optional Module (Elective Studies), must be chosen at least 13 ECTS**
- 521318S Modern Topics in telecommunications and Radio Engineering, 3-7 ECTS*
- 521443S Electronics Design II, 5 ECTS
- 521433A Laboratory Exercises on Analogue Electronics, 3 ECTS
- 521488S Multimedia Systems, 6 ECTS
- 521266S Distributed Systems, 4 ECTS
- 521260S Programmable Web project, 5 ECTS

Also at most 4 ECTS Finnish language studies can be included in optional studies

* This course is typically lectured several times a year with different themes and credits varying 3-7 ECTS. Student can include this course with different topics several times into optional studies.
Finnish language Studies, can be chosen at most 4 ECTS
It is possible to include at most 4 ECTS of optional Finnish language studies into a degree. Language studies must be included into the Optional Module/Elective studies. The Finnish language studies must be chosen from the set of Finnish language courses given by the UO language center or by UO open university. Recommended Finnish courses are as follows:

900017Y Survival Finnish Course, 2 ECTS
900013Y Beginner’s Finnish Course I, 2 ECTS
900053Y Beginner’s Finnish Course II, 4 ECTS

Other obligatory studies

521016A Advanced practical training, 3 ECTS
Diploma (master’s) thesis work, 30 ECTS
Also a written English language proficiency test must be passed before graduation

Timing Schedule for Students Starting in September 2012

First year autumn:
- 23 ECTS basic studies
- optional studies depending on accepted personal study plan

First year spring:
- 11 ECTS basic studies
- 24 ECTS advanced studies
- optional studies depending on accepted personal study plan

Summer:
- 3 ECTS advanced practical training (equals to 2 months full-time workload)

Second year autumn:
- 7 ECTS basic studies
- starting of 30 ECTS diploma thesis practical work
- optional studies depending on accepted personal study plan

Second year spring:
- 9 ECTS advanced studies
- completion of 30 ECTS diploma thesis manuscript
- completion of optional studies in order to fulfil the 13 ECTS requirement of optional studies
<table>
<thead>
<tr>
<th>Autumn 2012</th>
<th>Spring 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Periods 1-3</td>
<td>Periods 4-6</td>
</tr>
<tr>
<td><strong>Introduction to Optimization (5 cr, 1-2 p)</strong></td>
<td><strong>Mobile Telecommunication Systems (5 cr, 4-6)</strong></td>
</tr>
<tr>
<td><strong>Elements of Inform. Th. and Coding (5 cr, 1-3 p)</strong></td>
<td><strong>Commun. Signal Processing I (6 cr, 4-5 p)</strong></td>
</tr>
<tr>
<td><strong>Wireless Communications II (8 cr, 1-3 p)</strong></td>
<td><strong>Wireless Communications III (8 cr, 4-6 p) (odd)</strong></td>
</tr>
<tr>
<td><strong>Communication Networks I (5 cr, 1-3 p)</strong></td>
<td><strong>Commun. Signal Processing II (4cr, 5-6 p) (odd)</strong></td>
</tr>
<tr>
<td><strong>Multimedia Systems (6 cr, 2-3 p)</strong></td>
<td><strong>Radio Channels (5 cr, 4-6 p) (odd)</strong></td>
</tr>
<tr>
<td><strong>Electronics Design II (5 cr, 1-2 p)</strong></td>
<td><strong>Communication Networks II (7 cr, 4-6 p)</strong></td>
</tr>
<tr>
<td><strong>Laboratory Exercises on Analogue Electronics (3 cr, 1-6 p)</strong></td>
<td><strong>Finnish Language studies</strong></td>
</tr>
<tr>
<td><strong>Basic</strong></td>
<td><strong>Advanced</strong></td>
</tr>
<tr>
<td>odd = lectured on odd years 2013, 2015, 2017, ... only</td>
<td>even = lectured on even years 2014, 2016, 2018, ... only</td>
</tr>
</tbody>
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**Autumn 2013**

**Spring 2014**

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**Seminar in Telecommunication and Radio Engineering (1 cr, 1-6 p)**

**Modern Topics in Telecommunications and Radio Engineering (3-7 cr, 1-6 p)**

*Topics for the autumn and spring terms of the study year 2013-1014 will be announced later*

<table>
<thead>
<tr>
<th>Autumn 2013</th>
<th>Spring 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Radio Engineering I (6 cr, 1-3 p)</strong></td>
<td><strong>Radio Engineering II (5 cr, 4-6 p) (even)</strong></td>
</tr>
<tr>
<td><strong>Advanced Practical Training (3 cr)</strong></td>
<td><strong>Antennas (4 cr, 4-6 p) (even)</strong></td>
</tr>
<tr>
<td><em>(recommended in summer)</em></td>
<td><strong>Distributed Systems (6 cr, 4-5 p)</strong></td>
</tr>
<tr>
<td><strong>Programmable Web Project (5 cr, 4-6 p)</strong></td>
<td><strong>Diploma (M.Sc.) Thesis Work (30 cr)</strong></td>
</tr>
</tbody>
</table>

**Finnish Language studies**

<table>
<thead>
<tr>
<th>Basic</th>
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<th>Optional Studies</th>
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