

International Master's Degree Programme in Wireless Communication Engineering (WCE)

Curriculum for Student Group 2017-2019

1. Structure of WCE Studies

The [Centre for Wireless Communications](#) (CWC) at the [Faculty of Information Technology and Electrical Engineering](#) (ITEE), [University of Oulu](#) is responsible for organizing the 2 years international master's degree programme of [Wireless Communication Engineering](#) (WCE). WCE programme consist of 120 ECTS credits of studies based on the modules described below. 60 ECTS credits measure the workload of a full-time student during one academic year, which equals around 1500-1800 hours per year. Thus one ECTS credit stands for 25-30 working hours. The structure of WCE studies is organized in the following manner:

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| Basic WCE studies (RAN: 40, RF: 41 ECTS) |
| Advanced WCE studies (RAN: 25, RF: 28-29 ECTS) |
| Optional WCE studies (RAN: ³ 22, RF: ³ 17-18 |
| Advanced practical training (3 ECTS) |
| Master's (Diploma) Thesis work (30 ECTS) |
| In total 120 ECTS |

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

All WCE courses are implemented in English. Execution of the WCE programme consist of passing the courses contained in the *basic*, *advanced* and *optional* (elective studies) modules. All courses within the basic module must be completed. There is freedom to choose elective courses for the optional module as well as for advanced module. 17-22 ECTS of elective studies, depending of study option, must be chosen. The total number of elective credits depends on the number of advanced courses included into advanced module. That's why the

minimum and maximum number of credit points in advanced and optional modules varies a within the limits shown above.

In addition, master's thesis work (30 ECTS equals roughly 6 month workload) and advanced practical training (3 ECTS equals roughly 2 month workload) are obligatory.

Mandatory WCE courses in basic and advanced modules are offered by the [Centre for Wireless Communications](#) unit. Most of elective courses are offered by other [ITEE](#) faculty units called [Electrical Engineering](#) (EE), and [Computer Science and Engineering](#) (CSE). Finnish language studies are offered by the UO [language & communication unit](#).

Student can include elective courses into his/her optional module (elective studies) even from other units & faculties of Oulu University, provided they are accepted into student's personal study plan (PSP) by the personal study advisor (Dr. Kari Kärkkäinen). *Always consult your personal study advisor before including elective courses offered by other units & faculties into your personal study plan, or before starting to listen the course.* Courses from CWC, EE and CSE research units/departments can be included directly into your PSP without consulting your study advisor (see the list for such elective studies in Chapter 4).

If a student fails to pass an exam, she/he can try again on next final exam date of that course. Typically 3-4 exams are arranged per year for each course (depending on whether summer exams are arranged or not). *Notice, no restrictions are imposed on the number and the time-span of taken exams for each course, i.e., if you fail an exam, you can retry during next exams, or next study year.* Also, if you are not satisfied with your grade, you can try to upgrade your grade in next exams without restrictions. *Exams are always written with a pencil.* Use of permanent ink pen is not obligatory, and it is not recommended.

Each WCE student has to submit an electronic personal study plan (PSP) to the programme's personal study advisor Dr. Kari Kärkkäinen for approval at the beginning of studies (typically in October-November). Instructions session for creation of a PSP will be arranged at the beginning of autumn term. PSP is prepared with the aid of OodiPSP under [Weboodi environment](#). Look at the OodiPSP instructions on the page: <http://www.oulu.fi/cwc/node/11468>.

2. General Issues Dealing with Studies

Academic study year at UO is divided into 4 periods. Periods 1, and 2 run on autumn (A) term, and periods 3 and 4 run on spring (S) term. Time span for each period is 7-8 weeks. Each study year consists of appr. 32 weeks of teaching. Between 2nd and 3rd periods there is a season break for the Christmas & New Year between 23.12.2017-7.1.2018 (weeks 52-1). No teaching and exams are arranged during that holiday season.

The exact dates for the periods of the study year 2017-2018 are the following: 1st: 4.9.-27.10.2017 (weeks 36-43), 2nd: 30.10.-22.12.2017 (weeks 44-51), 3rd: 8.1.-9.3.2018 (weeks 2-10), 4th: 12.3.-11.5.2018 (weeks 11-19). Summer brake is between 14.5.-31.8.2017. Summer exams are typically arranged in summer time. Mandatory advanced practical training is recommended to be done during summer season after 1st study year. Training extension of 3 ECTS equals 2 month full-time workload.

University of Oulu orientation programme for all international master's degree students is arranged on 1.-8.9.2017 (week 36). *It is advised that WCE students could arrive to Oulu before the start of orientation programme in order to settle down and to get useful instructions and information in order to get started.*

At the beginning of studies during the orientation week a WCE student will get his/her personal UO e-mail account, and a licenses to use UO computer networks, i.e. will get UID & PW for UO computer systems. Those computer systems are needed in executing exercise and design works for courses of WCE curriculum, as well as, to access lecture and exercise materials stored in pdf-format in [Optima](#) environment.

3. Computer Environments and Study Portals in UO Computer Networks

After enrolling to Oulu University in September, you will get your personal userID & password for UO IT service's computer network needed in your studies. It is called: **paju.oulu.fi** –account. You need paju-account when using **OPTIMA**, **WEBOODI**, and **NOPPA** study portals that will be explained briefly below. In addition you will get your personal userID & password for CWC & EE & CSE unit's computer network, which is shortly called as **EE -network**. It is called: **ee.oulu.fi** –account.

Students will get their personal UO e-mail address & service for the Microsoft's **Office 365 for Education (O365)** cloud service: <http://o365.oulu.fi/>. Office 365 for Education (O365) It will offer our students a free Outlook email, and also free cloud services like Office Online applications (Word, Excel, PowerPoint, OneNote), calendar and OneDrive.

All official correspondence from UO teachers and student service officers is communicated with you only using O365 system's e-mail. Although you may prefer your personal mail system (Gmail, Yahoo, Hotmail, etc.), UO personnel does not use your personal e-mail address in matters dealing with your studies. *That's why remember every now and then check your O365 e-mail account in order not to miss important messages from teachers, etc., or forward mails for your personal account.* Instructions how to get and activate O365 service can be found from: <http://www.oulu.fi/ict/office365> .

Course materials are typically stored into the **TTK-OPTIMA** portal: <https://optima.oulu.fi/>. OPTIMA is an interactive study environment and two-way communication channel between student and teacher in order to share study materials and work assignments, and to discuss with teachers.

NOPPA study portal (<https://noppa.oulu.fi/noppa/kurssit/>) is an open (i.e. no UID & PW needed to use it) study environment where all home pages of our courses exist, and learning outcomes and up-to-date daily information dealing with detailed execution of courses are located (lecture & exercise & exercise work schedules, course books, mode of delivery). All WCE courses are located on NOPPA page: <https://noppa.oulu.fi/noppa/kurssit/organisaatio/tkst4342s>

WEBOODI (<https://weboodi.oulu.fi/oodi/>) is an environment where all official detailed course descriptions including course books, timing periods, mode of delivery and requirements are located. Final marks of completed courses will be stored, and will appear there. **Weboodi is a “mother of all study-related systems” at our university, under which all other environments are located.**

In addition, *students have to register for courses before course starts, and also for exams with WEBOODI. When registering to an exam using WEBOODI you always has to ask exam questions in English. Failing to register means that you cannot participate the exam!* Your personal student tutor will advise you at the beginning of your studies how to use those five study environments. Don't worry, you will learn them easily.

LATURI (<https://laturi.oulu.fi/index.php?uilang=en-US>) is an environment which loads your master's thesis for inspection to indicate possible plagiarism in thesis.

URGUND (<http://www.urkund.com/fi/>) checks your master's thesis dealing with plagiarism issues.

TUUDO course teaching calendar: Each WCE student have to create into his/her smart phone own electronic TUUDO lecture & exercise calendar containing dates, times and rooms of their courses for each period of academic year 2017-2018. This is one of the first things to be done after your arrival. TUUDO will pick up all timing & room information from the Weboodi system. Student tutors (Kummis) will help new WCE students in creation of TUUDO calendar and introduce for the use of Weboodi, TUUDO and OPTIMA environments.

Introduction to TUUDO: <http://www.oulu.fi/university/node/42359>

4. Curriculum Schedule for Students Starting in September 2017

4.1 WCE Radio Access Networks Study Option (WCE-RAN)

| Basic Module (all courses obligatory) | Course code | ECTS | Suggested study year | Precise course timing (A=autumn, S=spring) | Lecturer |
|---|-------------------------|------|----------------------|--|--|
| Introduction to Optimization | 031025A | 5 | 1 | A2017 (period 1) | Prof. Keijo Ruotsalainen |
| Statistical Signal Processing | 521348S | 5 | 1 | A2017 (period 1) | Adj. Prof. Janne Lehtomäki |
| Broadband Communications Systems | 521316S | 5 | 1 | A2017 (period 1) | Prof. Nandana Rajatheva |
| Elements of Information Theory and Coding | 521321S | 5 | 1 | A2017 (period 2) | Prof. Nandana Rajatheva (IT part), University Teacher Timo Kokkonen (Coding part) |
| Mobile Telecommunication Systems | 521385S | 5 | 1 | S2018 (period 3) | Prof. Marcos Katz |
| Wireless Communications I | 521323S | 5 | 1 | A2017 (period 2) | Prof. Jari Iinatti |
| Communication Networks I | 521340S | 5 | 1 | A2017 (period 2) | Prof. Mika Ylianttila |
| Communication Signal Processing I | 521324S | 5 | 1 | S2018 (period 3) | Prof. Markku Juntti |
| total | | 40 | | | |

| Advanced Module (all courses obligatory) | Course code | ECTS | Suggested study year | Precise course timing (A=autumn, S=spring) | Lecturer |
|--|-------------------------|------|----------------------|--|--------------------------------------|
| Communication Networks II | 521377S | 7 | 1 | S2018 (periods 3-4) | Prof. Mika Ylianttila |
| Wireless Communications II | 521317S | 8 | 1 | S2018 (periods 3-4) | Adj. Prof. Antti Tölli |
| Radio Engineering I | 521326S | 5 | 2 | A2018 (period 2) | University Teacher Risto Vuohtoniemi |
| Communication Signal Processing II | 521325S | 5 | 1 | S2018 (period 4) | Prof. Markku Juntti |
| total | | 25 | | | |

- ☐ = Student has to choose one from this set of two courses (one course of these is obligatory, and the other one has to be allocated into the optional module). Antenna course is lectured next time on spring term of year 2018. Radio Channels course is lectured next time on spring term of year 2019.
- * = A bi-annual course lectured only on even years 2018, 2020, 2022,...
- # = A bi-annual course lectured only on odd years 2019, 2021, 2023,...

With the elective courses of an optional module a student can extend his/her knowledge from wireless communications, e.g., into the areas of practical electronics design, wireless measurement techniques and computer science & engineering. Notice that on the next page's table there some recommendations depending

on your interests. You are anyway free to choose the elective courses you like. You have to choose elective courses depending on how many credits are chosen into your advanced module. You can also do more courses than the minimum ECTS requirement if you wish. *It is also possible to include at most 10 ECTS of Finnish language studies into your optional module.* Finnish language studies are recommended for all WCE students, especially during first study year, in order to integrate with Finnish society. Basic Finnish vocabulary is useful in daily life, although most Finnish people speak satisfying English outside our university campus.

| Optional Module (elective studies) | Course code | ECTS | Suggested study year | Suggested course timing | Lecturer |
|---|-------------------------|------|----------------------|--|---|
| Survival Finnish Course | 900017Y | 2 | 1 | annually, announced at the beginning of semester § | UO language center/ open university |
| Beginner's Finnish I Course | 900013Y | 3 | 1 | annually, announced at the beginning of semester § | UO language center/ open university |
| Beginner's Finnish II Course | 900053Y | 5 | 1,2 | annually, announced at the beginning of semester § | UO language center/ open university |
| Modern Topics in Telecommunications and Radio Engineering | 521318S | 3-7 | 2 | annually (periods 1-4) @ © | Prof. Matti Latva-aho and Prof. Jari Inatti are responsible |
| Antennas | 521388S | 5 | 1 | S2018 (period 4) * © | Dr. Markus Berg |
| Radio Channels | 521386S | 5 | 2 | S2019 (period 4) ☒ © | Dr. Markus Berg |
| Radio Engineering II | 521327S | 6 | 2 | S2019 (period 3) © ^a | University Teacher Risto Vuotoniemi |
| Telecommunication engineering project | 521322S | 5 | 2 | A2018 (periods 1-2) © | Dr. Markus Berg, Dr. Harri Saarnisaari |
| Wireless Measurements | 521097S | 5 | 2 | S2019 (period 3) © ^a | Dr. Juha Saarela |
| RF Components and Measurements | 521225S | 5 | 2 | S2019 (period 4) © ^a | Dr. Merja Teirikangas |
| Electronics Design II | 521401S | 6 | 2 | A2018 (period 1) ^a | Adj. Prof. Tarmo Ruotsalainen |
| Electronics Design III | 521435S | 6 | 2 | A2018 (period 2) ^a | Adj. Prof. Tarmo Ruotsalainen |
| Electronic System Design | 521405S | 5 | 2 | A2017 (period 1) ^a | Adj. Prof. Kari Määttä |
| Communication Circuit Design | 521402S | 6 | 2 | A2018 (period 1) ^a | Prof. Timo Rahkonen |
| Electronics Design and Construction Exercise | 521300S | 6 | 2 | A2018 (periods 1-2) ^a | Adj. Prof. Kari Määttä |
| Research Method | 813621S | 2 | 2 | A2018 (periods 1-2) § | Dr. Arto Lanamäki |
| Bio-signal processing | 521273S | 5 | 2 | A2018 (period 2) § | Prof. Tapio Seppänen |
| Digital Video Processing | 521259S | 5 | 2 | A2018 (period 2) § | Dr. Esa Rahtu |
| Human Computer Interaction | 521145A | 5 | 2 | A2018 (period 2) § | Dr. Denzil Ferreira |
| Signal Processing Systems | 521279S | 5 | 2 | A2018 (period 2) § | Prof. Olli Silven |
| Ubiquitous Computing Fundamentals | 521148S | 5 | 2 | A2018 (periods 1-2) § | Dr. Hannu Kukka |
| Application Specific Signal Processors | 521281S | 5 | 2 | A2018 (period 1) § | Dr. Teemu Nyländen |
| Computer Graphics | 521493S | 7 | 2 | S2019 (period 4) § | Dr. Guoying Zhao, Dr. Jie Chen, Dr. Jukka Holappa |
| Distributed Systems | 521290S | 5 | 2 | S2019 (period 3) § | Prof. Timo Ojala |
| Machine Vision | 521466S | 5 | 2 | S2019 (period 3) § | Prof. Janne Heikkilä |
| Mobile and Social Computing | 521147S | 5 | 2 | S2019 (periods 3-4) § | Dr. Denzil Ferreira |
| Programmable Web Project | 521260S | 5 | 2 | S2019 (periods 3-4) § | Dr. Ivan Milara |

| | | | | | |
|------------------|-------------------------|-----------------|---|-----------------------|------------------|
| Software Project | 521479S | 7 | 2 | A2018 (periods 1-2) § | Prof. Juha Rönig |
| total | | ³ 22 | | | |

§ = See details of timing either from WEBOODI (<https://weboodi.oulu.fi/oodi/>), or from NOPPA (<https://noppa.oulu.fi/noppa/app>), or from UO language centre's web page: <http://www.oulu.fi/languagesandcommunication/>

* = A bi-annual course lectured only on even years 2018, 2020, 2022,...

= A bi-annual course lectured only on odd years 2019, 2021, 2023,...

@ = Exact topics will be announced along each semester. Typically there will be several topics for each study year. *Notice also, you can choose several course topics of 3-7 ECTS credits under this "umbrella course" 521318S, not just one.*

© = This course is recommended for all WCE students.

^a = If you are interested in radio frequency electronics design, a proper collection from these courses is recommended.

§ = If you are interested in computer engineering issues to widen your expertise, a proper collection from these courses is recommended.

| Other obligatory studies included in WCE Master's degree | Course code | ECTS | Suggested study year | Precise timing |
|---|-------------------------|------|--|--|
| Advanced practical training (includes also a written training report) | 521016A | 3 | after first study year, suggested between June and August of summer 2018 | 2 months of full workload equals 3 ECTS credits |
| M.Sc. (Diploma) thesis work | 521998S | 30 | 2 | A2018- S2019 |
| Written English language proficiency test | | 0 | 2 | after written master's thesis is accepted and ready to be loaded to LATURI and URGUND check. |
| total | | 33 | | |

4.2 WCE Radio Engineering Study Option (WCE-RF)

| Basic Module (all courses obligatory) | Course code | ECTS | Suggested study year | Precise course timing (A=autumn, S=spring) | Lecturer |
|---------------------------------------|-------------------------|------|----------------------|--|--------------------------------------|
| Electronics Design II | 521401S | 6 | 1 | A2017 (period 1) | Adj. Prof. Tarmo Ruotsalainen |
| Statistical Signal Processing | 521348S | 5 | 1 | A2017 (period 1) | Adj. Prof. Janne Lehtomäki |
| Broadband Communications Systems | 521316S | 5 | 1 | A2017 (period 1) | Prof. Nandana Rajatheva |
| Radio Engineering I | 521326S | 5 | 1 | A2017 (period 2) | University Teacher Risto Vuohtoniemi |
| Wireless Communications I | 521323S | 5 | 1 | A2017 (period 2) | Prof. Jari Iinatti |
| Communication Signal Processing I | 521324S | 5 | 1 | S2018 (period 3) | Prof. Markku Juntti |
| RF Components and Measurements | 521225S | 5 | 1 | S2018 (period 4) | Dr. Merja Teirikangas |
| Electronic System Design | 521405S | 5 | 2 | A2018 (period 1) | Adj. Prof. Kari Määttä |
| total | | 41 | | | |

| Advanced Module (all courses obligatory) | Course code | ECTS | Suggested study year | Precise course timing (A=autumn, S=spring) | Lecturer |
|--|-------------------------|-------|----------------------|--|---|
| Electronics Design III | 521435S | 6 | 1 | A2017 (period 2) | Adj. Prof. Tarmo Ruotsalainen |
| Radio Engineering II | 521327S | 6 | 1 | S2018 (period 3) | University Teacher Risto Vuohtoniemi |
| Antennas *☐ | 521388S | 5 | 1 | S2018 (period 4) | Dr. Markus Berg |
| Radio Channels #☐ | 521386S | 5 | 2 | S2019 (period 4) | Dr. Markus Berg |
| Communication Circuit Design | 521402S | 6 | 2 | A2018 (period 1) | Prof. Timo Rahkonen |
| Telecommunication engineering project ☐ | 521322S | 5 | 2 | A2018 (periods 1-2) | Dr. Markus Berg, Dr. Harri Saarnisaari |
| Electronics Design and Construction Exercise ☐ | 521300S | 6 | 2 | A2018 (periods 1-2) | Adj. Prof. Kari Määttä |
| total | | 28-29 | | | |

* = A bi-annual course lectured only on even years 2018, 2020, 2022,...

= A bi-annual course lectured only on odd years 2019, 2021, 2023,...

☐ = Student has to choose one from this set of two courses (one course of these is obligatory, and the other one has to be allocated into the optional module).

With the elective courses of an optional module a student can extend his/her knowledge from wireless communications, e.g., into the areas of practical electronics design, wireless measurement techniques and computer science & engineering. Notice that on the next table there are some recommendations depending on your interests. You are anyway free to choose the elective courses you like. You have to choose elective courses depending on how many credits are chosen into your advanced module. You can also do more courses than the minimum ECTS requirement if you wish. *It is also possible to include at most 10 ECTS of Finnish language studies into your optional module.* Finnish language studies are recommended for all WCE students, especially during first study year, in order to integrate with Finnish society. Basic Finnish vocabulary is useful in daily life, although most Finnish people speak satisfying English outside our university campus.

| Optional Module (elective studies) | Course code | ECTS | Suggested study year | Suggested course timing | Lecturer |
|---|-------------------------|------|----------------------|--|--|
| Survival Finnish Course | 900017Y | 2 | 1 | annually, announced at the beginning of semester # | UO language center/ open university |
| Beginner's Finnish I Course | 900013Y | 3 | 1 | annually, announced at the beginning of semester # | UO language center/ open university |
| Beginner's Finnish II Course | 900053Y | 5 | 1,2 | annually, announced at the beginning of semester # | UO language center/ open university |
| Modern Topics in Telecommunications and Radio Engineering | 521318S | 3-7 | 2 | annually (periods 1-4) *☉ | Prof. Matti Latva-aho and Prof. Jari Iinatti are responsible |
| Antennas | 521388S | 5 | 1 | S2018 (period 4) ☉ | Dr. Markus Berg |
| Radio Channels | 521386S | 5 | 2 | S2019 (period 4) ☉ | Dr. Markus Berg |
| Mobile Telecommunication Systems | 521385S | 5 | 1 | S2018 (period 3) ☉ | Prof. Marcos Katz |
| Elements of Information Theory and Coding | 521321S | 5 | 1 | A2017 (period 2) ☉ | Prof. Nandana Rajatheva (IT part), University Teacher Timo Kokkonen (Coding part) |
| Communication Networks I | 521340S | 5 | 2 | A2018 (period 2) ☉ | Prof. Mika Ylianttila |

| | | | | | |
|--|-------------------------|------------------------|---|-----------------------|---|
| Communication Networks II | 521377S | 7 | 2 | S2019 (periods 3-4) © | Prof. Mika Ylianttila |
| Wireless Communications II | 521317S | 8 | 2 | S2019 (periods 3-4) © | Adj. Prof. Antti Tölli |
| Communication Signal Processing II | 521325S | 5 | 2 | S2019 (period 4) | Prof. Markku Juntti |
| Wireless Measurements | 521097S | 5 | 2 | S2019 (period 3) © | Dr. Juha Saarela |
| Research Method | 813621S | 2 | 2 | A2018 (periods 1-2) § | Dr. Arto Lanamäki |
| Bio-signal processing | 521273S | 5 | 2 | A2018 (period 2) § | Prof. Tapio Seppänen |
| Digital Video Processing | 521259S | 5 | 2 | A2018 (period 2) § | Dr. Esa Rahtu |
| Human Computer Interaction | 521145A | 5 | 2 | A2018 (period 2) § | Dr. Denzil Ferreira |
| Signal Processing Systems | 521279S | 5 | 2 | A2018 (period 2) § | Prof. Olli Silven |
| Ubiquitous Computing Fundamentals | 521148S | 5 | 2 | A2018 (periods 1-2) § | Dr. Hannu Kukka |
| Application Specific Signal Processors | 521281S | 5 | 2 | A2018 (period 1) § | Dr. Teemu Nyländén |
| Computer Graphics | 521493S | 7 | 2 | S2019 (period 4) § | Dr. Guoying Zhao, Dr. Jie Chen, Dr. Jukka Holappa |
| Distributed Systems | 521290S | 5 | 2 | S2019 (period 3) § | Prof. Timo Ojala |
| Machine Vision | 521466S | 5 | 2 | S2019 (period 3) § | Prof. Janne Heikkilä |
| Mobile and Social Computing | 521147S | 5 | 2 | S2019 (periods 3-4) § | Dr. Denzil Ferreira |
| Programmable Web Project | 521260S | 5 | 2 | S2019 (periods 3-4) § | Dr. Ivan Milara |
| Software Project | 521479S | 7 | 2 | A2018 (periods 1-2) § | Prof. Juha Röning |
| total | | ³ 17- 18 | | | |

= See details of timing either from WEBOODI (<https://weboodi oulu.fi/oodi/>), or from NOPPA (<https://noppa oulu.fi/noppa/app>), or from UO language centre's web page: <http://www oulu.fi/languagesandcommunication/>

* = Exact topics will be announced along each semester. Typically there will be several topics for each study year. *Notice also, you can choose several course topics of 3-7 ECTS credits under this "umbrella course" 521318S, not just one.*

© = This course is recommended for all WCE students.

^a = If you are interested in radio frequency electronics design, a proper collection from these courses course is recommended.

§ = If you are interested in computer engineering issues to widen your expertise, a proper collection from these courses is recommended.

| Other obligatory studies included in WCE Master's degree | Course code | ECTS | Suggested study year | Precise timing |
|---|-------------------------|------|--|--|
| Advanced practical training (includes also a written training report) | 521016A | 3 | after first study year, suggested between June and August of summer 2018 | 2 months of full workload equals 3 ECTS credits |
| M.Sc. (Diploma) thesis work | 521998S | 30 | 2 | A2018- S2019 |
| Written English language proficiency test | | 0 | 2 | after written master's thesis is accepted and ready to be loaded to LATURI and URGUND check. |
| total | | 33 | | |

Course descriptions, learning outcomes and detailed content of all courses can be found in electronic form by from the WEBOODI portal:

<https://weboodi.oulu.fi/oodi/>

Course home pages, as well as up-to-date timing info and calendar changes dealing with courses (cancelled/moved lectures, room changes) can be found from the NOPPA portal:

<https://noppa.oulu.fi/noppa/kurssit/organisaatio/tkst4342s>

Course materials are stored in OPTIMA portal:

<https://optima.oulu.fi/learning/id76/bin/user>

All WCE curriculum documents, forms, templates, etc. can be founded from here:

<http://www.oulu.fi/cwc/wce>

which is the most important storage of WCE programme's information during your studies. Bookmark it now!