Microwave Engineering I, winter 2019 - individual progress form

Mark the completed tasks (this page) and learning outcomes (other side!) into this form! Have it always with you in the contact sessions.

If the form is filled precisely and with good reasoning, and returned in the end of the course, you may earn up to three (3) extra points.

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **Mark up your points!** | Pre task 1 (0-3 p) | Clicker lecture 1  (0-2 p) | Pre task 2  (0-3 p) | Clicker lecture 2  (0-2 p) | Prob. 1  (0-3 p) | Prob. 2  (0-3 p) | Prob. 3  (0-3 p) | Prob. 4  (0-3 p) | Prob. 5  (0-3 p) | Prob. 6  (0-3 p) |
| Topic 1 |  |  |  |  |  |  |  |  |  |  |
| Topic 2 |  |  |  |  |  |  |  |  |  |  |
| Topic 3 |  |  |  |  |  |  |  |  |  |  |
| Topic 4 |  |  |  |  |  |  |  |  |  |  |
| Topic 5 |  |  |  | |  |  |  |  |  |  |
| Specific topic on radio waves safety | |  |  |  |  |  |  |  |  |  |

Topic 1: transmission line theory and waveguides

Topic 2: Smith chart and impedance matching

Topic 3: analysis of microwave circuits

Topic 4: radio systems

Topic 5: radio wave propagation

Specific topic: safety issues of radio waves (MyCourses online workshop in February)

Tentative grading of the course: 50% of the points → grade 1, 60% → 2, 70% → 3, 80% → 4, 90% → 5

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| Learning outcomes  (If you don’t understand what the learning outcome means, ask the teachers.) | Mark here which **pre tasks** (e.g., Pre task 2 of Topic 1), **clicker lectures** (e.g., Clicker 1 of Topic 2) **exercise problems** (Problem 3.3), **course book chapters** and/or any other source that are related to this outcome. | Mark **the date** when you **master** this outcome. |
| I am able to **identify** the types of radio waves. |  |  |
| I am able to **discuss** the usage of radio-frequency spectrum and typical applications in microwave engineering. |  |  |
| I am able to **discuss** the biological effects and safety issues of radio waves. |  |  |
| I am able to **explain** the behaviour (such as signal propagation, attenuation, reflection) of a radio-frequency signal in transmission lines. |  |  |
| I am able to **calculate** and **simulate** circuit parameters (such as voltage, current, power, characteristic impedance, loss, reflection coefficient etc.) related to transmission lines. |  |  |
| I am able to **design** transmission lines (such as microstrip line, coaxial line) with calculations and simulation (AWR) |  |  |
| I can **design** impedance matching circuits using Smith chart and simulator tool (AWR). |  |  |
| I am able to **explain** the design principles and bandwidth issues related to impedance matching. |  |  |
| I am able to **model** the operation of microwave circuits and resonators with suitable circuit parameters (e.g., S, Z, Y, ABCD). |  |  |
| I can **analyse** the operation of basic microwave circuits and resonators based on basic calculations and simulations (AWR). |  |  |
| I am able **explain** the operational principles of basic microwave systems, such as mixing phenomenon and superheterodyne transceivers. |  |  |
| I can **calculate** the relevant radio system parameters, such as signal-to-noise ratio, noise figure and link budget analytically. |  |  |
| The student is able to **explain** the basic principles of radio wave propagation (such as Fresnel ellipsoid, effect of atmosphere and weather). |  |  |
| I am able to **calculate** the basic characteristics of radio links based on basic propagation models. |  |  |