

Course	Name	: Communication Electronics
	Code	: EE184633
	Credits	: 3
	Semester	: VI

Description of Course

This course provides a basis for understanding and designing high frequency electronics, especially microwave and higher frequencies. At high frequencies the voltage, current, impedance and wave propagation quantities are no longer possible only to be analyzed using the ordinary electrical and electronic circuit approach. For this reason, it requires in-depth knowledge about the specific properties of RF transmission line components, impedance, refraction coefficient, scattering parameters for N-port circuits, and various important aspects needed in the design of active and passive telecommunications circuits, such as RF amplifiers, Mixers and Oscillators. Equally important, in this lecture is taught telecommunications design using a tool or programming tool, for example using Matlab.

Learning Outcomes

Knowledge

(P03) Mastering the concepts and principles of design procedure in power systems, control systems, multimedia telecommunications, or electronics.

Specific Skill

(KK01) Able to formulate engineering problems in power systems, control systems, multimedia telecommunications, or electronics.

General Skill

(KU12) Able to implement information and communication technology (ICT) in the context of implementation of his/her work.

Attitude

(S09) Demonstrating attitude of responsibility on work in his/her field of expertise independently.

(S12) Working together to be able to make the most of his/her potential.

Course Learning Outcomes

Knowledge

Mastering the concepts, principles and procedures of telecommunications electronic design in the field of multimedia telecommunications, which involves 3 main aspects, namely frequency, impedance and electromagnetic properties.

Specific Skill

Able to formulate telecommunication electronics engineering problems, able to describe system design (for example, RF amplifiers) and be able to utilize technology-based analysis and engineering tools (MatLab, CST).

General Skill

Able to make decisions appropriately in the context of solving Telecommunications Electronics problems, based on analysis of information and related data, including the use of programming tools.

Attitude

Demonstrating attitude of responsibility on work in his/her field of expertise independently.

Main Subjects

1. Telecommunications / RF Electronics Components and Systems
2. Properties of Passive RF Components at High Frequency
3. Transmission Line Analysis in RF system design
4. Use of smith-charts and programming in analysis and design
5. Single & Multiport Network
6. Scattering Parameters
7. RF Amplifier Design
8. Technique of adjusting impedance and impedance transformation
9. High-frequency filter and oscillator design concepts

Reference(s)

- [1] Endroyono,dkk. "Modul Ajar Elektronika Telekomunikasi dan Manual Praktikum" 2014
- [2] Reinhold Ludwig&Pavel Bretchko, "RF Circuit Design, Theory and Applications", Prentice-Hall, 2000.
- [3] MatLAB files dari Reinhold Ludwig&Pavel Bretchko, "RF Circuit Design, Theory and Applications", Prentice-Hall, 2000.
- [4] David M. Pozar, "Microwave Engineering" John Willey & Sons, 4th Edition, 2011
- [5] Thomas S. Lavergetta, "Microwave and wireless RF Simplified", Artech House, 2nd Edition, 2005

Prerequisite(s)

EE184306 Electronic Circuits

EE184532 Electromagnetic Wave Transmission and Antennas
