

<b>Course (MK)</b>	Course Name	: Networks and Traffic Engineering
	Code	: EE184533
	Credits	: 4
	Semester	: V

### Description of Course

Network and Traffic Engineering discusses networks which include the evolution of telecommunications network technology, transmission systems, switching systems, time-division switching, system switching control, signaling, and packet switching. Telecommunications traffic engineering discusses traffic characterization, traffic mathematical models, loss systems (Erlang B) and queuing systems (Erlang C), forecasting telecommunications network engineering demand and traffic.

### Learning Outcomes

#### Knowledge

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

#### Specific Skill

(KK03) Able to describe system design for problem solving in power systems, control systems, multimedia telecommunications, or electronics by concerning technical standards, performance aspect, reliability, ease of application, and assurance of sustainability.

#### 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 basic concepts of networks, the development of telephony networks and telecommunications traffic engineering and able to plan system capacities in the case of telecommunications networks.

#### Specific Skill

Able to analyze the basis of the network, the development of telephone networks and telecommunications traffic engineering and be able to plan system capacity in the case of telecommunications networks.

#### General Skill

Able to use Matlab software to generate traffic mathematical models and create system loss simulation models and queuing systems.

#### Attitude

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

Working together to be able to make the most of their potential.

### Main Subjects

1. Development of telecommunications
2. Telecommunication transmission
3. Evolution of switching systems
4. Switching system
5. Switching time-division
6. Control switching systems
7. Signaling
8. Switching packages
9. Network concept
10. Basic concept of quantity and unit of telecommunications traffic
11. Mathematical model of telecommunications traffic.
12. Loss system, Erlang-B
13. Unlimited queueing system, Erlang-C
14. Finite queue system.
15. Traffic forecasting and demand forecasting

### Reference(s)

- [1] Thiagarajan Viswanathan, Telecommunication Switching System and Network, Prentice-Hall, 1992
- [2] Gilbert Held, S. Ravi Jagannathan, Practical Network Design Techniques, Second Edition, CRC Press, 2004
- [3] Tarmo Anttalainen, Introduction to Telecommunication Network Engineering 2ed, Artech House, 2003
- [4] Kesidis, G., "An introduction to Communication Network Analysis", Wiley, 2007.
- [5] Iversen, Villy Bæk, "Teletraffic Engineering and Network Planning", Technical University of Denmark, Fotonic, 2015.
- [6] T. S. Rappaport, "Wireless Communications: Principles and Practice", second edition, Prentice Hall, 2002

### Prerequisite(s)

EE184405 Probabilitas, Statistics, and Stochastic Processes  
EE184302 Introduction to Telecommunication Systems and Networks