

Course content relevant for exam

(S-72.423 Telecommunication Systems)

Topics that are mentioned **both** in the lecture slides (powerpoint slides) **and** in the books or web sources are of prime importance.

Topics that are mentioned in the lecture slides are all important if not explicitly stated otherwise in the following slides here. Since the lecture slides do not explain the topics in detail, it is essential to search for the topics in books or web sources (for instance www.ericsson.com/support/telecom) and study the topics in detail there.

Topics that are explained in books or web sources (for instance www.ericsson.com/support/telecom) but are not mentioned in the lecture slides are **not** important and will **not** be included in the exam.

Note: (*) asterisk after book source means that this reference material has been copied (max. 20 pages / book) and distributed via the course material distribution service.

Regarding acronyms, the **meaning** is important (not the words which they stand for).

For instance, when describing "GGSN", it is not necessary to remember the exact words (Gateway GPRS Support Node), but rather the meaning (for instance "GGSN is a network node that connects the GPRS packet core of a network operator to external packet networks, e.g. Internet", other explanations are naturally also possible).

As another example, if you are asked to associate an acronym with the text "This is a network node that connects the GPRS packet core of a network operator to external packet networks, e.g. Internet", and the options are SGSN, GGSN, HLR, GMSC, you should be able to identify the correct option.

In summary, you should be able to show that you are familiar with the most important acronyms in telecommunications. A good reference for telecommunication acronyms can be found at http://www.mpirical.com/companion/mpirical_companion.html

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Introduction:

Understanding Telecommunications:

www.ericsson.com/support/telecom -section A: General review

PTSN:

Understanding Telecommunications:

www.ericsson.com/support/telecom -section B: PSTN

Alberto Leon-Garcia, Indra Widjaja: Communication Networks*, pp. 234-250

SS7/IN/ISDN:

Topics are widely explained in www.ericsson.com/support/telecom

Chapter 4 of the book "Engineering Networks ..." by P.K. Bhatnagar* (SS7 and ISUP)

ATM:

Topics are widely explained in www.ericsson.com/support/telecom

AAL 2 is described in www.gdc.com/inotes/pdf/aal2tut.pdf

ADSL:

T. Starr, J.M. Cioffi, P.J. Silverman: Understanding Digital Subscriber Line Technology, Prentice-Hall* pp 2-22

C.K. Summers: ADSL - Standards, Implementation and Architecture, CRC Press* pp 47-66

Maxwell K.: "Asymmetric Digital Subscriber Line: Interim Technology for the Next Forty Years", IEEE Communications Magazine, Oct. 1996*

Reference: ITU-T: G.992.1-Asymmetrical digital subscriber line (ADSL) transceivers (can be downloaded in HUT's library)

GSM/GPRS:

GSM is explained in www.ericsson.com/support/telecom
(radio interface details are **not** required in the exam)

GPRS is explained in

www.comsoc.org/livepubs/surveys/public/3q99issue/bettstetter.html
(for system architecture, SM, MM and routing; again, the radio interface details are **not** required in the exam)

GSM signalling is explained in Sections 17.6 - 17.9 of the book
"Signaling in Telecommunication Networks" by J.G. van Bosse*
(GSM MAP signalling basics; this material is intended to show MM and CC in action, it is not important to remember all the details but rather the general idea how signalling works in practice)

Note: GSM radio interface details (GSM/GPRS slides 13-19) are **not** required in the exam!

TETRA:

The link www.aeroflex.com/tetra/productinfo/TETRABackgrounder.ppt
explains TETRA technology in more detail than the lecture slides.

DECT:

DECT is explained in www.ericsson.com/support/telecom

Another source for DECT is www.handytel.com/technology/dect01.htm

UMTS:

The evolution from GSM to 3G is explained in Chapter 2 of the book "UMTS Networks" by Kaaranen *et al.** (in fact this material supports also the GSM part of this course ...)

Note: UMTS protocols (UMTS slides 19-32), WCDMA radio interface details (UMTS slides 48-59) and 2G/3G services (UMTS slides 60-83) are **not** required in the exam!

Internet:

The Internet is explained in www.ericsson.com/support/telecom

Routing in the Internet is explained in Sections 4.4.2 - 4.4.5, 4.5 of the book "Computer Networking" by Kurose and Ross*

SIP is described in Section 3 of www.ietf.org/rfc/rfc3261.txt

The basics of RSVP, DiffServ and MPLS are described in the IETF links www.ietf.org/rfc/rfc2205.txt, www.ietf.org/rfc/rfc2475.txt and www.ietf.org/rfc/rfc2702.txt

Mobile IP is described in www.ietf.org/rfc/rfc2002.txt

Recommended reading:

www.computer.org/internet/v2n1/perkins.htm (Mobile IP)

www.convergedigest.com/Bandwidth/archive/010910TUTORIAL-rgallaher1.htm (MPLS)

www.techsupportalert.com/pdf/c0655.pdf (IPv6)