

## Preface

During the first decade of this millennium, more than €100 billion will be invested in third generation (3G) Universal Mobile Telecommunications System (UMTS) in Europe. This fact represents an amazing challenge from both a technical and commercial perspective. In the evolution path of GSM/GPRS standards, the UMTS proposes enhanced and new services including high-speed Internet access, video-telephony, and multimedia applications such as streaming.

Based on the latest updates of 3GPP specifications, this book investigates the differences of a GSM/GPRS network compared with a UMTS network as well as the technical aspects that ensure their interoperability. Students, professors and engineers will find in this book a clear and concise picture of key ideas behind the complexity of UMTS networks. This can also be used as a *starter* before exploring in more depth the labyrinth of 3GPP specifications which remain, however, the main technical reference.

Written by experts in their respective fields, this book gives detailed description of the elements in the UMTS network architecture: the User Equipment (UE), the UMTS Radio Access Network (UTRAN) and the core network. Completely new protocols based on the needs of the new Wideband Code Division Multiple Access (WCDMA) air interface are given particular attention by considering both Frequency- and Time-Division Duplex modes. Later on, the book further introduces the key features of existing topics in *Releases 5, 6 and 7* such as High Speed Downlink/Uplink Packet Access (HSDPA/HSUPA), IP Multimedia Subsystem (IMS), Long Term Evolution (LTE), WLAN interconnection and Multicast/Broadcast Multimedia Services (MBMS).

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Some of the figures and tables reproduced in this book are the result of technical specifications defined by the 3GPP partnership ([http://www.3gpp.org/3G\\_Specs/3G\\_Specs.htm](http://www.3gpp.org/3G_Specs/3G_Specs.htm)). The specifications are by nature not fixed and are susceptible to modifications during their transposition in regional standardization organizations which make up the membership of the 3GPP partnership. Because of this, and as a result of the translation and/or adaptation of these points by the authors, these organizations cannot be considered responsible for the figures and tables reproduced in this book.