



Courses Offered by the Central Asian Cellular Forum



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Table of Contents

1. Introduction.....	3
2. CDMA2000 and EVDO Related Courses	3
2.1. CDMA Principles for Engineers.....	3
2.2 CDMA2000 for Business Professionals.....	3
2.3 CDMA2000 Release 0.....	3
2.4 CDMA2000 Protocols and Signaling.....	4
2.5 CDMA2000 1x and EVDO Network Planning.....	4
2.6 Single Carrier 1x EVDO (Rel. 0 and Rev. A) Technical Overview.....	4
2.7 Multicarrier EV-DO (Rev B) Technical Overview	5
2.8 Network Performance Assessment and Management Workshop.....	5
2.8.1 CDMA2000 1X Network Characterization Seminar	5
2.8.2 NPA Tools Overview	5
2.8.3 CDMA2000 1X Call Processing and	5
2.8.4 Signaling Procedures Seminar.....	5
2.8.5 CDMA2000 1X Failure Analysis Seminar	5

1. Introduction

The Central Asian CDMA Forum (www.3gca.org) in collaboration with QUALCOMM Inc., USA (www.qualcomm.com) has established the CDMA Human Resource Development Center in Islamabad, Pakistan. The center caters for the CDMA/WCDMA HR requirement for the whole Central Asian region. Due to the rapid developments in telecommunication industry there is a requirement of approximately 2000 CDMA and around 2500 WCDMA professional annually in the region. The center offer courses on the pattern that is followed by QUALCOMM Inc., USA. The courses offered by the center are briefly described in the next sections.

2. CDMA2000 and EVDO Related Courses

2.1. CDMA Principles for Engineers

Duration: 16 hours

This course provides the student an in-depth description of the functioning of a CDMA cellular telephony system. Emphasis is given to CDMA2000 systems, with some discussion given to WCDMA. Course discussions provide a point by point description of key processes including power control, physical channel generation, hand-off techniques, and call processing. This course concentrates on the fundamental concepts that drive a CDMA system design, and provides the student with a general overview of the physical layer requirements that could apply to CDMA2000, WCDMA and EV-DO. The Call Processing sections are limited to CDMA2000. Exercises are used throughout the course to challenge the student and reinforce the learning.

2.2 CDMA2000 for Business Professionals

Duration: 4 hours.

CDMA2000 is an important wireless technology that can efficiently support a large number of voice users while also provide data services such as Internet access, email, ring tone downloads, and camera phone uploads and downloads. CDMA2000 advantages include high capacity, longer battery life, and fewer dropped calls. It is important for many non-technical telecommunications professionals to understand the key concepts and “buzz words” of wireless networks. This course provides basic, easy-to-understand explanations of how CDMA2000 wireless networks work. Key concepts such as power control, handoffs, multiple access technologies, and roaming are provided. The course also provides a high level overview and performance comparisons of today’s Third Generation (3G) technologies. Key terminology is also defined.

2.3 CDMA2000 Release 0

Duration: 8 hours

This course provides the student an in-depth description of the functioning of a CDMA2000 system according to the key CDMA standards (TIA/EIA/IS2000-0). Course discussions provide a point by point description of key processes including variable rate Walsh spreading, new traffic channels, new power control modes, spread spectrum signal generation, MAC/LAC processing, hand-off techniques, call processing, registration, authentication, and encryption. Emphasis is placed on new features and capabilities introduced in CDMA2000 1X Release 0.

2.4 CDMA2000 Protocols and Signaling

Duration: 16 hours

This course takes an in-depth look at the protocols and signaling defined for CDMA2000 Release A systems. The course begins with an overview of CDMA2000 network architecture and air interface concepts. The layer 2 protocols are covered in detail, including Link Access Control, Medium Access Control, and Radio Link Protocol. Layer 3 signaling is covered, including overhead, call control, registration, authentication, encryption, handoff, and power control signaling. Topics pertaining to packet data services include dormancy, mobility management, resource allocation, and performance considerations.

2.5 CDMA2000 1x and EVDO Network Planning

Duration: 16 hours

The CDMA2000 family of technologies provides wireless solutions exhibiting increased voice capacity and fast, low latency packet data. With both CDMA2000 1x and 1xEV-DO, CDMA2000 builds on the inherent advantages of CDMA enabling increased data throughput rates and quality of service, while significantly improving network capacity and reducing delivery cost. This course provides a detailed view of how to plan a network for both CDMA2000 1X and CDMA2000 1xEV-DO. All aspects of network planning are covered including all the required processes and major activities. These are dealt with from a practical standpoint with an emphasis on addressing the challenges that an operator will meet during deployment.

2.6 Single Carrier 1x EVDO (Rel. 0 and Rev. A) Technical Overview

Duration: 16 hours.

This course provides an overview of CDMA2000 1xEV-DO including Release 0 and Revision A. It begins with a discussion of the relevant 3GPP2, CDG and IETF Standards, and introduces nomenclature unique to CDMA2000 1xEV-DO. The protocol stack, power-up sequence, and authentication options are presented. The Physical and MAC layers are covered in some detail as well as handoffs, the interfaces to higher layer applications, and Quality of Service (QoS) options. Alternative methods to support voice services are outlined and the course closes with pointers to additional reading and advanced courses.

2.7 Multicarrier EV-DO (Rev B) Technical Overview

Duration: 16 hours.

Currently there is a soaring demand of high quality wireless experience and data rates from mobile users. This is driving operators towards finding ways to optimize their current infrastructure. Multicarrier EVDO (Rev B) offers higher data rates, lower latencies among other advantages while being backward compatible with previous versions of EVDO. Operators considering multicarrier EV-DO need to understand its conceptual, technical and operational advantages. This course provides a holistic view of multicarrier EV-DO system. The students will gain an understanding of the functionalities and enhancements available for deploying current and new services using this technology. The course starts with the key concepts followed by a comprehensive overview of the physical, mac and application protocol changes related to multicarrier EVDO operations. Subsequently, there is a discussion of set management and handoffs. Finally network considerations and enhanced features for future deployments are explained.

2.8 Network Performance Assessment and Management Workshop

Duration: 40 hours

The optimization of nearly every CDMA 2000 network begins first with optimizing the network for voice. This course provides a comprehensive approach to optimization, including the measurement, analysis, and tuning of CDMA 2000 voice networks. A significant portion of the class is dedicated to class exercises that involve analyzing mobile log files to solve real-world network problems.

The workshop consists of the following sub-modules;

2.8.1 CDMA2000 1X Network Characterization Seminar

2.8.2 NPA Tools Overview

2.8.3 CDMA2000 1X Call Processing and

2.8.4 Signaling Procedures Seminar

2.8.5 CDMA2000 1X Failure Analysis Seminar