

Embedded Wireless Communication

Synopsis & Objective of Course

Embedded & mobile communication arguably has been the most expansively growing domain in the recent years. This particular training course named as “Embedded Wireless Communication” is a wide-ranging module covering the entire range of wireless technologies currently used today. The topics covered include :-

- Bluetooth
- Zigbee
- WiMax
- WiFi
- RFID
- IRDA
- GSM (3G)
- CDMA

Trainees will achieve a cohesive knowledge of these topics with clear conceptual understanding of various technologies & protocols associated with these.

Target Audience

This is a specially designed training module for Programmers & Engineers willing to sweep over various technologies used in wireless domain.

Please note: Trainees who need to get trained in-depth only in specific modules can contact us for a customisation of courses based on availability of trainers.

Prerequisites

Trainees are expected have to have sound fundamentals in basic electronics & elementary communication (sequential circuits, flip-flop design etc).

Knowledge of any programming language is helpful.

Delivery

This is a trainer led course with trainer(s) initially focusing on versatile concepts of wireless communication. This is will be followed by specific application oriented examples understanding of each & every topic involved.

Duration : 8 days

Course Contents

Day	Topic	Sub topics
Day 1	Introduction	Introduction to Wireless communications systems History & development of radio & wireless communications Basic Radio theory Analog vs. digital wireless communications systems Electromagnetic spectrum (Radio frequency, Microwave and Infrared (IR))

		<p>Spectrum Allocation & Interference</p> <p>Wireless Personal Area Network (WPAN)</p> <p>Wireless Local Area Network (WLAN)</p> <p>Wireless Metropolitan area networks (WMAN)</p> <p>Mobile devices networks</p>
Day 2	<p>Wireless Personal Area Network (WPAN)</p> <p>Applications for Bluetooth</p> <p>Working of Bluetooth</p> <p>Bluetooth networks</p> <p>Bluetooth hardware</p>	<p>Bluetooth</p> <p>The role of Bluetooth</p> <p>Market projections Bluetooth's technology</p> <p>Competing technologies:</p> <ul style="list-style-type: none"> - Infrared, IrDA - Wireless LANs - HomeRF - Integrated devices <p>Bluetooth usage models</p> <p>Cordless accessories: headsets, etc</p> <p>Bluetooth group applications</p> <p>Security devices</p> <p>The Bluetooth protocol architecture</p> <p>Frequency band and RF channels</p> <p>Bluetooth frequency hopping</p> <p>Master/Slave transmission</p> <p>The Packet format</p> <p>SCO links and ACL links</p> <p>Data rates</p> <p>Device addressing</p> <p>Controller states</p> <p>Access procedures & Error control</p> <p>Piconets</p> <p>Scatternets</p> <p>Addressing and selectivity</p> <p>Bluetooth Security:</p> <ul style="list-style-type: none"> - Authentication - Encryption <p>Example Bluetooth implementations</p> <p>Example antenna designs</p> <p>Size constraints</p> <p>Power consumption</p>

Day4	IrDA (Infrared Data Association) Radio Frequency Identification (RFID)	Introduction IrDA specifications (IrPHY, IrLAP, IrLMP, IrCOMM, Tiny TP, IrOBEX, IrLAN and IrSimple) List of applications RFID Introduction RFID Technology and Architecture RFID Standards RFID Applications RFID Security RFID Competing Technologies
Day 5	Wireless Local Area Network (WLAN) Wireless Metropolitan area networks (WMAN)	WiFi Introduction to Wireless LAN and IEEE 802.11 IEEE 802.11 Architecture - Physical Layer - Data Link Layer IEEE 802.11 Standards - IEEE 802.11b - IEEE 802.11a - IEEE 802.11g Security Competing Technologies to IEEE 802.11 WiMAX (Worldwide Interoperability for Microwave Access) WiMAX Introduction WiMAX Concept WiMAX Forum WiMAX Protocol WiMAX Architecture WiMAX Competing Technologies
Day 6	Mobile devices networks TDMA	GSM Basics GSM standard & services Network Architecture & components Authentication & Roaming Time Division Multiple Access (TDMA) Basics TDMA standards & services Network architecture & components Universal Wireless Communications Consortium (UWCC) Interoperability with CDMA & GSM Logical & physical channels Evolution & TIA/EIA-136

Day 7	CDMA	Code Division Multiple Access (CDMA) Basics CDMA standards & services Network architecture & components CDMA: Fundamental Principles Spread Spectrum & Multiplexing in CDMA standard Walsh Codes, short & long PN codes Handovers: hard, soft and softer CDMA Capacity and Cell Planning Issues CDMA capacity limitations CDMA spectral efficiency
Day 8		Emerging 3G Technologies <ul style="list-style-type: none"> - IMT-2000 Standardization Process - Overview of Business Drivers for 3G technologies - Data rate requirements - cdma2000 (TIA TR45.5 / 3GPP2) - Review of IS-95 A/B implementation - cdma2000 evolution from IS-9 - Introduction to W-CDMA - Overview of Wideband CDMA & GSM integration - 3G Wideband for TDMA - Evolution of IS-136 to 2.5G "136+" - Overview of IS-136 TDMA physical layer - High Speed IS-136 (IS-136 HS) Outdoor & Indoor Wireless Data Communications <ul style="list-style-type: none"> - What is wireless data? - Overview of existing and emerging standards - High Speed Circuit Switched Data Service (HSCSD) - Cellular Digital Packet Data (CDPD) - Wireless LANs (W-LANs) - Wireless Local Loop (WLL) - Wireless WWW and Wireless Application Protocol (WAP)

Trainers' Profile

Corporate Trainer(s) with more than 6 years of experience in embedded development & corporate training in CMM level5 companies.

Scheduled & On-site Training

Apart from in-house training programs, comprehensive training can be also provided as per the requirement & will be optimally customized as per the client's needs.

Please note: Trainees who need to get trained in-depth only in specific modules can contact us for a customisation of courses based on availability of trainers.

For training calendar, availability of seats & other details please mail us at training@sigmasolutions.co.in