

Introduction to Satellite Communications

- 15-16 April 2010
- A/Prof. Sorin Adrian Barbulescu, ITR, UniSA
- Perth
- Fee: AU\$1320 (includes GST)

Course Description

This two-day course gives an introduction to the Satellite Communications field. It introduces the basic orbital parameters, the space environment, followed by a detailed presentation of the link budget and various satellite access schemes. The ground station architecture and requirements are formulated. The building blocks of the satellite platform and the satellite payload are discussed together with the issues related to satellite installation in orbit. Bent-pipe versus on-board processing architectures are compared. Limitations and solutions for TCP/IP traffic over satellite are discussed, together with an example of a generic stream IP encapsulation protocol. Network dimensioning, satellite services including satellite Internet applications and specific issues for military applications are also introduced. A brief history of Australian contributions with a focus on the latest developments in satellite communications equipment concludes this course.

Course Outline:

- Orbits: Kepler's and Newton's Laws; Orbital Parameters; Inclined Orbits; Geostationary Orbit;
- Space environment: Mechanical Effects; Atmospheric Effects; Rain Attenuation; Polarisation and Propagation;
- Link budgets: Equivalent Isotropic Radiated Power; Received Signal Power; Noise Power at the receiver input; The Uplink and Downlink; Station-to-station link; Example using spreadsheet;
- Satellite Access: FDMA; TDMA; CDMA; Random access;
- Earth Stations: Standards; Antennas; Radio Frequency Subsystem; Communication Subsystem;
- Channel Coding: Block Codes; Convolutional Codes; Turbo-like Codes; Joint Source and Channel Coding;
- The Payload: Transparent Repeaters; Multibeam Satellite Repeater; Bent-pipe vs on-board processing; Antennas;
- The Platform: Attitude Control; The Propulsion System; The Power Supply; Telemetry, Tracking and Command;
- Satellite Services: Broadcasting Satellite Services (DBS, DVB-S); Fixed Satellite Services (INTELSAT, VSAT); Navigational Satellite



Services (NAVSTAR GPS); Earth Resource Satellite Services (Radarsat, NOAA); Mobile Services;

- Satellite Installation: Installation in Orbit; Launch Vehicles; Reliability issues;
- Satellite Internet: TCP/IP over satellite issues
- Network Dimensioning: System requirements; Types of traffic; ON-OFF vs Poisson model;
- MAC layer optimisation: Throughput control; Generic stream IP encapsulation;
- Specific issues: Protect your satellite link; Privacy
- New Trends: Australian contribution: FedSat; Key trends: space segment; Key trends: ground segment;
- SNAP: Concept; Statistical Multiplexing Gain; Platform;
- Antennas, RF front ends, Digital hardware, Correlators, Special receivers

Target Audience

The course is a general introduction to satellite communications. It is intended for those engineers and technicians working in the field who would like to get an overall understanding of the issues. Managers who need a sound understanding of the implications of the latest technology in improving the system efficiency and cutting costs will also benefit. The course does not require a specific background although a basic knowledge of digital communications would be useful.

Teaching Arrangements:

The course will be conducted from 9.00 am to 5.00 pm. Morning tea, lunch and afternoon tea will be provided.

For further info please contact

Anne-Marie Eliseo +61 8 8343 8710
or email industryeducation@nicta.com.au

How to Register:

- Register Online: www.nicta.com.au/short_courses
- Register using the form on the back of this page

Registration Form & Tax Invoice*

ABN 62 102 206 173

*Upon completion, this form will become a Tax Invoice.



How to register:

- Fax this form to +61 8 8343 8711 or
- Scan and email this form to industryeducation@nicta.com.au

Introduction to Satellite Communications

Date: 15-16 Apr 2010 Fee: \$1320 AUD (includes GST)

Location: Esplanade Hotel, 54 Marine Terrace, Fremantle, WA

Title:	Given Name:	Family Name:
Position:	Organization/Division:	
Postal Address:		Postcode:
Telephone No	Fax No	
Dietary preference:	Email:	

Method of Payment (please tick below):

- Cheque** (payable to National ICT Australia Ltd)
Please forward the cheque and this registration form to:

Annette Van Bramer, NICTA,
Innovation House, First Avenue,
Mawson Lakes SA 5095, Australia.

Credit Card

- Visa
 Master Card
 Amex

Credit Card No	Expiry Date
Name on Card	<input type="checkbox"/> Tick if receipt required
Amount AU\$	Signature
Email address of card holder	

Electronic Funds Transfer

Please advise by email to Annette Van Bramer
annette.vanbramer@nicta.com.au
when payment is made.

Bank: Commonwealth Bank of Australia
Account Name: National ICT Australia Limited
BSB: 062 900
Account No: 1032 4576
Course Ref. No: 150410

FAX the form to +61 8 8343 8711 or EMAIL it to industryeducation@nicta.com.au

Privacy Clause: The above information is being collected by NICTA and will be added to our contact database and will be used primarily to provide you with further information about NICTA events and services. All information is collected, used or disclosed subject to NICTA's Privacy Policy which can be accessed at http://nicta.com.au/about/nicta_website/privacy. Please tick the box below if you do NOT wish to receive any further mailings from NICTA.

I do not wish to receive any further mailings from NICTA

You can use the following options to access or remove your personal information from NICTA's databases, make a complaint about a breach of privacy or if you have a query relating to NICTA's privacy practices and policies:

- Send an email to comments@nicta.com.au or
- Phone NICTA's Industry Education Manager on +61 8 8343 8710.

For further information and enquires about group or student discounts, please contact:
Anne-Marie Eliseo
Industry Education Manager
Telephone: +61 8 8343 8710
Email: anne-marie.eliseo@nicta.com.au

Cancellation Policy: At least 4 weeks notice is required for full reimbursement. If cancellation is later than 4 weeks then the place can either be transferred to another person or the registrant can be provided with a credit towards other NICTA training.