



- o how the digital terrestrial television networks are deployed in practice
- o the evolving technologies and services in DTTB

6.0 Method of Teaching

1. Training materials will be made available each week consisting of PDF format presentation slides with the accompanying material (Core material) together with a reading list consisting of URLs/books/articles and references (Non Core material).
2. There will be discussion forums with weekly topics where participants are highly encouraged to participate to exchange views and share information.
3. Online chat sessions with the instructors will take place every Thursday of the week from 1 P.M. – 2 P.M (1 hour). New Zealand time (GMT +12). All participants are expected to join the forum
4. Review Quizzes will be assigned two (2) times. Each quiz would have twenty (20) multiple choice questions.
5. One individual assignment will be assigned to each participant.

Important:

During the course, participants are expected to check their mailboxes for new messages on a daily basis.

7.0 Evaluation

Besides the weekly quiz and their final assignment score, participants will be evaluated according to their substantive posts on the discussion forum, active participation in the online chat sessions and other course activities, reflecting both the quantity and quality of time spent on the course. Below are the evaluation schemes:

- Quizzes: 40% (Quiz 1: 20%, Quiz 2: 20%)**
Assignment #1: 20%
Participation: 40%
- Chat session: 15%
 - Discussion forum: 25%

Total Evaluation: 100%

Grades will be allocated based on the performance.

8.0 Course Schedule

Week	Topics	Important Notice
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<p>1</p> <p>04/10/2010 – 10/10/2010</p>	<ul style="list-style-type: none"> • Overview of Analog TV and the transition to Digital Terrestrial Television Broadcasting (DTTB) <ul style="list-style-type: none"> ○ Analogue TV Technology and Standards: A recap ○ Digital Television –DTV; Basics of DTV, DTV model ○ DTV benefits: consumers, broadcasters and policy makers perspectives ○ Baseband signal for DTV, ○ Systems or Forms of DTV and Standards ○ Digital Terrestrial Television Broadcasting (DTTB) standards ○ Overview of DTTB standards ATSC, ISBD and DVB-T ○ Resolution and frame rates ○ HDTV, UHDTV • Discussion/ Chat session 	<ul style="list-style-type: none"> • Introduction of instructors and Participants • Chat session with instructors on Thursday (1 P.M. – 2 P.M. New Zealand Time) <ul style="list-style-type: none"> - 07/10/2010
<p>2</p> <p>11/10/2010 – 17/10/2010</p>	<ul style="list-style-type: none"> • Frequency Spectrum and its Management for DTTB <ul style="list-style-type: none"> ○ Radio spectrum management Issues for DTTB ○ Spectrum efficiency and DTTB ○ Single Frequency Networks ○ Digital dividend ○ Transmission path • Discussion/ Chat session 	<ul style="list-style-type: none"> • Chat session with instructors on Thursday (1 P.M. – 2 P.M. New Zealand Time) <ul style="list-style-type: none"> - 14/10/2010
<p>3</p> <p>18/10/2010 – 24/10/2010</p>	<ul style="list-style-type: none"> • Core Technologies for Digital Terrestrial TV - Core Technology 1: Compression Technologies <ul style="list-style-type: none"> ○ Audio & Video compression theory, underlying concepts ○ Spatial, temporal and statistical redundancy ○ Types of compression ○ Basic interlacing and progressive scanning ○ Group of pictures (GOP) and I-, B- and P-frames ○ Understanding macro blocks, slices and frame ordering ○ Predictive coding and motion compensation ○ Motion vectors, discrete cosine transform (DCT) and entropy coding ○ Pre-processing and building efficient compression systems 	<ul style="list-style-type: none"> • Chat session with instructors on Thursday (1 P.M. – 2 P.M. New Zealand Time) <ul style="list-style-type: none"> - 21/10/2010 • Quiz 1 starting on Friday <ul style="list-style-type: none"> - 22/10/2010 • Assignment



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	<ul style="list-style-type: none"> o Creating bit streams and multiplexing o MPEG-1, 2, 4, profiles and levels, transport streams o H.264, AVC, SVC, and evolutions o Multiplexing, data framing <ul style="list-style-type: none"> • Discussion and Quiz • Assignment 	
<p>4</p> <p>25/10/2010 – 31/10/2010</p>	<ul style="list-style-type: none"> • Core Technology 2: Source and Channel Coding Techniques <ul style="list-style-type: none"> o Forward Error Correction - FEC methods o Need for FEC o Reed Solomon (RS), Convolutional codes, Viterbi decoding o Bit Interleaving, inner interleaver, outer interleaver o Statistical Multiplexing • Core Technology 3: Advanced Modulation Techniques <ul style="list-style-type: none"> o Orthogonal Frequency Division Multiplexing - OFDM o Multi-path immunity, multi carriers o Quadrature Amplitude Modulation - QAM o Radio frequency carries systems, QPSK, 8-PSK, BPSK o Trellis encoding o Single frequency networks (SFN), multi frequency networks (MFN) o Rotated constellations • Discussion/ Chat session 	<ul style="list-style-type: none"> • Chat session with instructors on Thursday (1 P.M. – 2 P.M. New Zealand Time) - 28/10/2010
<p>5</p> <p>01/11/2010 – 07/11/2010</p>	<ul style="list-style-type: none"> • Migration to DTTB: The technical aspects <ul style="list-style-type: none"> o Key elements in the digital terrestrial Television network and their functionalities o Digital terrestrial TV network planning and how it differs from analogue planning o Changes necessary in the existing analogue TV network for migrating to DTTB o Examples of digital TV networks in practice o Cost considerations 	<ul style="list-style-type: none"> • Chat session with instructors on Thursday (1 P.M. – 2 P.M. New Zealand Time) - 04/11/2010 • Submission of Assignment by Thursday - 04/11/2010



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	<ul style="list-style-type: none"> • Discussion/ Chat session 	
<p>6</p> <p>08/11/2010 – 14/11/2010</p>	<ul style="list-style-type: none"> • Next Generation DTTB Technologies <ul style="list-style-type: none"> ○ Digital Video Broadcasting – Terrestrial- second generation; DVB-T2 ○ Improvements from DVB-T1 ○ Interactive services ○ Set-top-boxes ○ MHEG5, Multi-media Home Platform – MHP/GEM ○ Multiple inputs and single output for second generation MISO • Conclusion and Course Summary • Discussion • Quiz 2 • Evaluation of Training 	<ul style="list-style-type: none"> • Chat session with instructors on Thursday (1 P.M. – 2 P.M. New Zealand Time) <ul style="list-style-type: none"> - 11/11/2010 • Quiz 2 starting on Friday <ul style="list-style-type: none"> - 12/11/2010 • Evaluation of the course starting Friday <ul style="list-style-type: none"> - 12/11/2010