PADM7005

ICT Resource Allocation & Control

A core course in the degree of Master of Management in the field of ICT Policy & Regulation

Convenor: Charley Lewis

25 – 29 October 2010

CONTENTS

1 Content overview

This core course examines the principles of allocation and control of scarce ICT resources. These include: the electromagnetic spectrum, and regulating the electromagnetic spectrum through frequency band planning, allocation and assignment of frequencies; the principles, practices, legislation and regulation of interconnection and facilities leasing; rights of way, mast locations, co-location and access to facilities; numbering and naming systems, including number plans, number assignment, number portability, carrier pre-selection and e-num.

2 Session Summary

PADM7005 - ICT Resource Allocation & Control			
	Date	**Topic**	**Presenter**
1	09:00 – 13:00 Mon 25 Oct	Interconnection: An Introduction and Overview	Charley Lewis
2	14:00 – 16:00 Mon 25 Oct	Interconnection Simulation: Introduction & Round 1	Charley Lewis
3	09:00 – 12:00 Tues 26 Oct	Numbering	Charley Lewis
4	13:00 – 16:00 Tues 26 Oct	Interconnection: Legislation & Interconnection Guidelines	Kerron Edmunson
5	16:00 – 17:00 Tues 26 Oct	Interconnection Simulation: Round 2	Charley Lewis
6	09:00 – 12:00 Wed 27 Oct	Spectrum & Band Planning	Praneel Ruplal
7	13:00 – 16:00 Wed 27 Oct	Frequency Planning and Assignment	Praneel Ruplal
8	09:00 – 12:00 Thurs 28 Oct	Access to Facilities	Andrew Barendse
9	13:00 – 17:00 Thurs 28 Oct	Interconnection Simulation: Conclusion (Counts 20% towards final mark)	Charley Lewis
10	09:00 – 12:00 Fri 29 Oct	Examination	Charley Lewis

3 Course Outcomes

On completion of this course, participants will be able to:

- Articulate the importance of and key issues relating to interconnection, facilities leasing and rights of way in the telecommunications environment;
- Apply the principles and procedures of interconnection and facilities leasing;

- Describe the legal and regulatory framework governing interconnection, facilities leasing and rights of way;
- Negotiate an interconnection agreement;
- Describe the principles of the electromagnetic spectrum;
- Analyse the regulation of the electromagnetic spectrum through frequency band planning, allocation and assignment of frequencies;
- Articulate the principles, practices and key issues relating to numbering and naming systems.

4 Core Readings

The following readings are recommended as overall background for the course. All are available in electronic format:

- Intven, H, Oliver, J & Sepúlveda, E (2000) 'Interconnection', in Intven, H (ed) (2000) *Telecommunications Regulation Handbook*, World Bank, Washington DC, available online at http://www.infodev.org/en/Publication.22.html ***[e-mail]***
- InfoDev (2007) 'ICT Regulation Toolkit Module 2: Competition, Interconnection and Price Regulation, Executive Summary', prepared by NERA Economic Consulting, InfoDev, Washington, available online at http://www.ictregulationtoolkit.org//en/SectionPDF.1560.html ***[e-mail]***

5 Required Readings

One or more readings are **required** to be completed for each session. A number of these are distributed by e-mail from several weeks in advance of the course. They are usually sent out in APA referencing format, and you are required to locate each via a search engine (such as Google or Google Scholar) or on the university's database of journals, print and read them (they will not be reprinted for the course pack).

Other readings are printed out and included in your course pack. **You are expected to complete those readings required for each session in advance, as the lecture will assume familiarity with their content.**

Lecturers / facilitators who use teaching aids or provide additional material, will distribute these notes to you as they become available. These notes should be added to your course file and included as part of your course materials.

6 Additional Resources

An electronic library of course notes and additional reference material relevant to this course is made available via the Wits Ignite web site at http://ignite.wits.ac.za. You will be given a logon ID and password to allow you to access this material, which is loaded under the folder 'PADM5080 Costing and Pricing'. You are strongly encouraged to make extensive use of resources and features of this course web site.

You may also be required to contribute to online discussions or to complete assignments and other forms of assessment via this web site.

Note that many of these readings are presented in Acrobat Reader format, which will require you to have Acrobat Reader installed on your computer.

7 Preparation Requirements

Your preparation work – mainly reading - should be done individually ***in advance*** of the respective course sessions. Please note that there may be tasks to prepare for specific sessions. These will assist you to work through the conceptual and theoretical understandings in each of the readings and begin to apply these to cases and issues. Read through each session outline carefully to ensure that there are no mishaps.

> We assume that for every 1 hour that you spend in the classroom, 30 in total, you will need to spend approximately 4 additional hours in preparation. This includes reading, writing assignments and examinations.

8 Syndicates and Group Learning

An interactive and intensive learning methodology is utilised, which involves a combination of lectures, case studies, group and individual projects. Given that many participants are active in shaping the telecommunications sector, the P&DM endorses the "syndicate method" of teaching, which requires that some of the learning will be done in groups. This approach is designed to enable course participants to contribute to the course, bringing in their own practical experience, knowledge and expertise together with those of their peers to create a rich learning environment.

Each participant will be assigned to a syndicate group. Syndicates and group work are a vital component of the learning process and attendance at all syndicate meetings is required and compulsory.

Syndicate meetings will be organised by the group members at a time and place suitable to them in accordance with the programme's schedule. Although the P&DM will make syndicate meeting rooms available, these meetings need not be held on campus. Syndicate meetings and interactions may also take place virtually, through the course WebCT site and via the mailing lists which will be made available for this purpose.

Problems within syndicate groups are to be reported timeously to the Academic Convenor of this course, so that steps may be taken to resolve them. Syndicates will only be able to change their syndicate group composition under exceptional circumstances, and at the sole discretion of the Academic Convenor.

9 Course Assessment

There are several components to the assessment for this course, viz:

- individual (online) quiz - 10%
- group assignment - 20%
- individual examination - 70%

You will also be assessed by means of a short quiz, possibly online, designed to test your grasp of key concepts from the preparatory readings.

The group assignment, which is done in syndicate groups during the week, takes the form of a simulation exercise, and will count 20% towards your final mark for the course.

The **Individual Examination** will count **70%** towards your final mark for the course, and is scheduled to take place on **Friday 29 October 2010 from 09:00 to 12:00**.

Should you for any reason need to apply for a deferred exam for the Individual Examination, be aware that this will be granted only in the most exceptional of cases, and ensure that you follow precisely the requirements laid down in the 2010 P&DM Study Guide.

9 Information on Content Sessions

Session 1: Interconnection: An Introduction and Overview	
Presenter	Charley Lewis
Outcomes	Participants will be able to: • Describe the role of interconnection in telecommunications; • Analyse the principles and procedures governing the regulation of interconnection.
Content	• Importance of interconnection • What is interconnection • Regulation of interconnection • Interconnection principles and procedures • Technical and operational aspects of interconnection • Financial terms of interconnection • Dispute resolution
Core Readings	• Melody, W (1997) 'Interconnection: Cornerstone of Competition', in Melody, W (ed) *Telecom Reform: Principles, Policies and Regulatory Practices*, Den Private Ingeniørfond, Technical University of Denmark, Lyngby, available online at http://lirne.net/2003/resources/tr/chapter05.pdf *[e-mail]* • Intven, H, Oliver, J & Sepúlveda, E (2000) 'Interconnection', in Telecommunications Regulation Handbook, Intven, H (ed), World Bank, Washington DC, available online at http://www.infodev.org/files/1083_file_module3.pdf *[e-mail]* • Noam, E (2002) 'Interconnection Practices' in Cave, M, Majumdar, S & Vogelsang, I, *Handbook Of Telecommunications Economics, Volume 1: Structure, Regulation and Competition*, Elsevier Books, Amsterdam, available online at http://www.citi.columbia.edu/elinoam/articles/interconnection_pricing.htm *[e-mail]* • Marcus, J & Elixmann, D (2008) 'The Future of IP Interconnection: Technical, Economic, and Public Policy Aspects', Executive Summary, WIK-Consult, Study for the European Commission, European Commission, Brussels, available online at http://ec.europa.eu/information_society/policy/ecomm/doc/library/ext_studies/future_ip_intercon/ip_intercon_study_exec_sum.pdf *[e-mail]* • Kerf, M, Neto, I & Géradin, D (2005) 'Interconnection Disputes: Antitrust or Sector Regulation and the Case of New Zealand', Public Policy for the Private Sector, No 295, June 2005, World Bank, Washington DC, available online at http://rru.worldbank.org/documents/publicpolicyjournal/295kerf.pdf *[e-mail]*

Additional References	• Armstrong, M (2002) 'The Theory of Access Pricing and Interconnection', in Cave, M, Majumdar, S & Vogelsang, I, *Handbook Of Telecommunications Economics, Volume 1: Structure, Regulation and Competition*, Elsevier Books, Amsterdam • Falch, M (2005) 'Cost-based Interconnection Charges, Competition and Investment', in Mahan, A & Melody, W (eds) (2005) *Stimulating Investment in Network Development: Roles for Regulators*, World Dialogue on Regulation for Network Economies Lyngby, Denmark, available online at http://www.ictregulationtoolkit.org/en/Document.2918.pdf • Gabel, D (2002) 'A Competitive Market Approach to Interconnection Payments', in Mansell, R, Samarajiva, R & Mahan, A (eds) *Networking Knowledge for Information Societies: Institutions & Intervention*, Delft University Press, 2002, available online at http://lirne.net/resources/netknowledge/gabel.pdf • ITU (2001) *Trends in Telecommunication Reform 2000-2001: Interconnection And Regulation*, International Telecommunication Union, Geneva, last seen at http://www.ituarabic.org/arabbook/2004/GTTR-2000.pdf • ITU (2006) *Report on Interconnection*, ITU-D Study Group 1, 3rd Study Period (2002-2006), International Telecommunication Union, Geneva, available online at http://www.itu.int/publ/D-STG-SG01.06.1-2006/en • Jamison, M (nd) 'Regulatory techniques for addressing interconnection, access, and cross-subsidy in telecommunications', Public Utility Research Center, University of Florida, available online at http://www.regulationbodyofknowledge.org/documents/104.pdf • Marcus, J (2007) *Interconnection on an IP-based NGN Environment*, Discussion paper prepared for Global Symposium for Regulators, Dubai World Trade Center, Dubai,, United Arab Emirates, 5 - 7 February 2007, International Telecommunication Union, Geneva, available online at http://www.itu.int/ITU-D/treg/Events/Seminars/GSR/GSR07/discussion_papers/JScott_Marcus_Interconnection_IP-based.pdf • Samarajiva, R & Melody, W (2000) 'ITU Fixed-mobile Interconnection Briefing Paper', International Telecommunication Union, Geneva, available online at http://www.itu.int/osg/spu/downloads/FMI_Briefing_Final1.pdf
Activity	
About your Lecturer	 Charley Lewis is a senior lecturer, researcher and consultant at the LINK Centre of the School of Public and Development Management at the University of the Witwatersrand. His areas of interest include: labour, work and ICT; ICT sector policy and regulation; universal service and access; the Internet, and business process outsourcing. He has lectured and presented widely, on a number of ICT policy, regulation and development issues. He has undertaken research in a number of areas, including the Internet, call centres, e-learning and universal access and service. He holds the degree of Master of Commerce in the Management of Information Systems from the University of the Witwatersrand.

Session 2: Interconnection Simulation: Introduction	
Presenter	Charley Lewis
Outcomes	Participants will be able to: • Apply the principles, practices and processes of interconnection to the negotiation of an interconnection agreement within the context of a structured scenario.
Content	• Assignment of interconnection stakeholder roles • Initial statement of positions (1 page) • Public and private negotiations between stakeholders • Statement of revised positions (1 page) • Final public negotiation • Revised interconnection agreement
Core Readings	• University of Maryland (2005) 'Interconnection Simulation Scenario' • Private role sheet briefing
Additional References	You may refer to any of the readings assigned for the course
Activity	You are required to negotiate a revised interconnection agreement in the context of the scenario outlined to all participants, considering the issues and concerns contained in your individual private role sheet, and informed by the issues and principles covered in the course. You will do this in a series of public forums in which you will engage formally with the other stakeholders, but you are also welcome to make use of off-the-record, private meetings with individual stakeholders. You will be assessed on both the quality and content of your two public submissions (each counting 30%) and on the final interconnection agreement reached (40%).
About your Lecturer	See above.

Session 3: Access to Facilities	
Presenter	Andrew Barendse
Outcomes	Participants will be able to: • Articulate the concepts of and rationale for regulating facilities leasing and rights of way; • Discuss issues, trends and best practices pertaining to facilities leasing and rights of way in the modern telecommunications environment; • Analyse the implications and impact of facilities leasing and rights of way legislation and regulation.
Content	• Facilities leasing and rights of way: concepts and issues • Facilities leasing and rights of way in the context of liberalisation and convergence • International trends governing the regulation of facilities leasing and rights of way • Legal framework for facilities leasing and rights of way in South Africa • Regulations governing facilities leasing and rights of way in South Africa; • Issues and challenges
Core Readings	• Esselaar, S, Gillwald, A & Sutherland, E (2007) 'The regulation of undersea cables and landing stations', LINK Centre, University of the Witwatersrand, Johannesburg, available online at http://link.wits.ac.za/papers/esselaar-et-al-2007-undersea-cables.pdf *[e-mail]* • Melody, W & Møller, D (1997) 'Rights of Way as a Foundation for Infrastructure Competition', in Melody, W (ed) *Telecom Reform: Principles, Policies and Regulatory Practices*, Den Private Ingeniørfond, Technical University of Denmark, Lyngby, available online at http://lirne.net/2003/resources/tr/chapter10.pdf *[e-mail]* • ICASA (2007) 'Electronic Communications Facilities Leasing Regulations Pursuant to Chapter 8 of the Electronic Communications Act No 36 of 2005', Notice 1794 of 2007, Government Gazette No 30605, 24 December 2007, Independent Communications Authority of South Africa, Johannesburg, available online at http://www.info.gov.za/gazette/notices/2007/30605.pdf • ICASA (2007) 'Regulations Prescribing a List of Essential Facilities and Matters Related Thereto, Pursuant to Section 43(8) of the Electronic Communications Act No 36 of 2005', Notice 1800 of 2007, Government Gazette No 30612, 24 December 2007, Independent Communications Authority of South Africa, Johannesburg, last seen at http://www.ellipsis.co.za/wp-content/uploads/2008/05/draft-list-of-essential-facilities-g24122007-g30612.pdf

Additional References	• Jagun, A (2008) 'The Case for "Open Access" Communications Infrastructure in Africa: The SAT-3 / WASC cable – A briefing', Association for Progressive Communications, Johannesburg, available online at http://www.apc.org/en/system/files/APC_SAT3Briefing_20080515.pdf • Devaney, P (2001) 'Rights-of-Way Management', TeleCommunity Alliance, Washington DC, available online at http://www.telecommunityalliance.org/images/APWA.ROWmanagement.pdf • NTIA (2004) 'Improving Rights-of-Way Management Across Federal Lands: A Roadmap for Greater Broadband Deployment', Report by the Federal Rights-of-Way Working Group, National Telecommunications and Information Administration, Washington, DC, available online at http://www.ntia.doc.gov/reports/fedrow/FROWReport_4-23-2004.pdf • NTOA (1998) 'Local Government Principles Relating to Rights-Of-Way Management and Compensation & Ownership of Telecommunications Facilities', National Association of Telecommunications Officers and Advisors, Alexandria, VA, available online at http://www.natoa.org/documents/Local_Government_Principles_Relating_to_Rights-of-Way.pdf
Activity	
About your Lecturer	Andrew Barendse (PhD) is Visiting Adjunct Professor in the Graduate School of Public and Development Management. Prior to his appointment at Wits he held the positions of Assistant Professor and Research Fellow at Delft University of Technology in the Netherlands. He has 20 years experience in the telecom sector. His research interests include various aspects of telecom regulation, corporate strategy and public values in network industries. 

Session 4: Interconnection: Legislation & Interconnection Guidelines	
Presenter	Kerron Edmunson, Attorney & Solicitor
Outcomes	Participants will be able to: • Articulate the concepts of and rationale for regulating interconnection; • Analyse the key aspects of the South African legislation and regulations governing interconnection; • Assess interconnection agreements; • Describe the impact of interconnection on other communications policies and regulations; • Discuss current issues, trends and best practices pertaining to interconnection within the South African telecommunications in the context of liberalisation and convergence.
Content	• Legal framework for interconnection in South Africa • Regulations / guidelines governing interconnection in South Africa • Interconnection: key competition principles, concepts and issues • Terms and conditions of interconnection agreements – pricing & non-pricing • Interconnection in the context of liberalisation and convergence • Broader impact of interconnection legislation on other regulatory requirements, including retail pricing, CoA / CAM, number portability, carrier pre-selection, licensing of new entrants • Interconnection issues and challenges
Core Readings	• RSA (2005) *Electronic Communications Act*, No 36 of 2005, Republic of South Africa, Pretoria, available online at http://www.icasa.org.za/Manager/ClientFiles/Documents/EComsAct_2005_No_36.pdf • Thornton, L (2007) 'The Regulation of Interconnection and Facilities Leasing in South Africa Under the Electronic Communications Act, 2005', Lisa Thornton Inc, Johannesburg • ICASA (2010) ''Call Termination Regulations' Pursuant to Section 67(4) of the Electronic Communications Act No 36 of 2005', Notice 314 of 2010, Government Gazette Vol 538 No 33121, 16 April 2010, Independent Communications Authority of South Africa, Johannesburg • ICASA (2010) 'Interconnection Regulations 2010', Electronic Communications Act (36/2005): Regulations in terms of sections 4 and 38 read with section 4 (3) (j) of the ICASA Act (13/2000) with respect to Interconnection Regulations, Regulation Gazette No 9263, Government Gazette Vol 538 No 33101, 9 April 2010, Independent Communications Authority of South Africa, Johannesburg • Interconnection agreement between Cell C (Pty) Ltd and Vodacom (Pty) Ltd

Additional References	• EC (2002) 'Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities (Access Directive)', European Commission, Brussels, available online at http://www.legi-internet.ro/access.htm • EC (1997) 'Directive 97/33/EC of the European Parliament and of the Council of 30 June 1997 on interconnection in Telecommunications with regard to ensuring universal service and interoperability through application of the principles of Open Network Provision (ONP)', European Commission, Brussels, available online at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31997L0033:EN:HTML • ICASA (2010) 'ICASA Wholesale Call Termination Market Review for the period 2010-2013: Explanatory Note for the draft Call Termination Regulations', Government Gazette Vol 538 No 33121, 16 April 2010, Independent Communications Authority of South Africa, Johannesburg • Naidoo, S (nd) 'Are MTN and Vodacom profiteering at our expense?', National Consumer Forum Johannesburg, available online at http://www.ncf.org.za/docs/publications/consumerfair/vol2/complaint.htm • OECD (nd) 'Australia's new telecommunications access regime: Part XIC, Trade Practices Act 1974, Organisation for Economic Co-operation and Development, Paris, available online at http://www.oecd.org/dataoecd/49/52/1911798.pdf • WTO (1996) 'Negotiating Group on Basic Telecommunication: Reference Paper', World Trade Organisation, Geneva, available online at http://www.wto.org/english/news_e/pres97_e/refpap-e.htm
Activity	
About your Lecturer	 Kerron Edmunson is a qualified attorney and solicitor operating a consultancy business in Johannesburg, offering strategic legal, regulatory and commercial support to clients in the information and electronic communications industries (formerly known as telecommunications and broadcasting); and to corporate commercial clients in utility and other industries, working in the public and private sector. Kerron qualified with a BA LLB in 1994 and has since held the position of director at Edward Nathan (Pty) Ltd (SA), been appointed a senior solicitor in the Royal Mail (UK) legal department, been employed as a senior solicitor in private practice at Denton Wilde Sapte (UK) for 4 years and worked as in-house legal counsel for one of the mobile telecommunications operators in South Africa.

Session 6: Numbering	
Presenter	Charley Lewis
Outcomes	Participants will be able to: • Recognise numbers as a finite resource; • Understand numbering terminology; • Describe international best practice in numbering and number planning; • Recognise the relevance of numbering for the various stakeholders; • Discuss the regulatory issues relating to numbering; • Analyse the approach to numbering regulation in South Africa.
Content	• Importance of numbering • Numbering terminology • ITU standards • Perspectives on numbers • Number portability, carrier pre-select & e-num • Number planning • ICASA & the SA numbering plan
Core Readings	• Milne, C (2005) 'World numbering developments', Antelope Consulting, London, available online at http://www.antelope.org.uk/numbering/World_numbering_developments.pdf *[e-mail]* • ICASA (2010) 'Numbering Plan Regulations', Notice 546 of 2010, Government Gazette No 33269, Independent Communications Authority of South Africa, Sandton, 4 June 2010 • ICASA (2005) 'Number Portability Regulations', Regulation Gazette No 8320, Government Gazette Vol 483 No 28091, Independent Communications Authority of South Africa, Sandton, 30 September 2005 • ICASA (2008) 'Electronic Communications Act (36/2005): Intention to make Carrier Pre-selection regulations', Notice 1485 of 2008, Government Gazette No 31640, Independent Communications Authority of South Africa, Sandton, 24 November 2008

Additional References	• Horrocks, J, Lewin, D & Milne, C (2000) 'A strategic numbering review: report to the Dutch Government', Antelope Consulting, London, available online at http://www.antelope.org.uk/numbering/DGTP_report.pdf • ICASA (2001) 'Telecommunications Numbering Plan 2001', Notice 1424 of 2001, Independent Communications Authority of South Africa, Sandton • ICASA (2004) 'Draft Functional Specification for Mobile Number Portability under the Number Portability Regulations', Government Gazette No 27062, Independent Communications Authority of South Africa, Sandton • ICASA (2005) 'Number Portability Regulations', Regulation Gazette No 8320, Government Gazette No 28091, Independent Communications Authority of South Africa, Sandton, 30 September 2005 • ICASA (2005) 'Regulations on Carrier Pre-Selection', Notice 975 of 2005, Government Gazette No 27717, Independent Communications Authority of South Africa, Sandton • ITU (1997) 'E.164 - The International Public telecommunication Numbering Plan', International Telecommunication Union, Geneva • Milne, C (1997) 'The Design and Management of Numbering', in Melody, W (ed) *Telecom Reform: Principles, Policies and Regulatory Practices*, Den Private Ingeniørfond, Technical University of Denmark, Lyngby, available online at http://lirne.net/2003/resources/tr/chapter12.pdf • Milne, C (2002) Numbering harmonisation in the SADC region: a draft discussion paper, Antelope Consulting, London • Obermier, T (2001) 'The Crucial Role of Local Number Portability in Today's Telecommunications Industry', *The Journal of Technology Studies*, Volume XXVII, No 1, Winter/Spring 2001, available online at http://scholar.lib.vt.edu/ejournals/JOTS/Winter-Spring-2001/pdf/obermier.pdf • Rogerson, D, Holland, M, & Griffiths, N (2005) 'Mobile Number Portability – an international benchmark', A report to MTN, Ovum, London, available online at http://www.icasa.org.za/Repository/resources/Events&%20Publications/Publications/2.Ovum%20FinalReport.doc • Strålmark, J (2001) 'Summary - ENUM - functions that maps telephone numbers to Internet based addresses: A description and the possible introduction to Sweden', National Post and Telecom Agency, Stockholm, available online at http://www.ero.dk/67447693-A83F-4AFD-A48C-32BE4049F60B • Sutherland, E (2007) 'Mobile number portability', *info*, Vol 9 No 4, Emerald Group, Bingley
Activity	
About your Lecturer	See above.

Session 8: Spectrum and Band Planning	
Presenter	Praneel Ruplal
Outcomes	Participants will be able to: • Describe the nature and uses of the electromagnetic spectrum; • Articulate the role and importance of spectrum management in telecommunications and broadcasting; • Analyse the structures, processes and issues governing the planning of spectrum utilisation.
Content	• Introduction to the electromagnetic spectrum • Technical considerations of spectrum management • Spectrum Management: definition, issues and terminology • Key drivers of spectrum demand • Spectrum management structures • Table of frequency allocations • Band planning • Spectrum pricing
Core Readings	• Arnbak , A (1997) 'Managing the Radio Spectrum in the New Environment', in Melody, W (ed) Telecom Reform: Principles, Policies and Regulatory Practices, Den Private Ingeniørfond, Technical University of Denmark, Lyngby, available online at http://lirne.net/2003/resources/tr/chapter11.pdf ***[e-mail]*** • Benkler, Y (2002) 'Some Economics of Wireless Communications', Harvard Journal of Law & Technology, Vol 16, No 1, Fall 2002, available online at http://jolt.law.harvard.edu/articles/pdf/v16/16HarvJLTech025.pdf • McLean Foster (2007) 'ICT Regulation Toolkit: Radio Spectrum Management - Executive Summary', McLean Foster & Co, in collaboration with Martin Cave and Robert W. Jones, InfoDev, Washington & International Telecommunication Union, Geneva, available online at http://icttoolkit.infodev.org/admin/www.ictregulationtoolkit.org/Mod5ExecSum ***[e-mail]*** • Lewis, S (1996) 'Radio Frequency Spectrum Management from the Perspective of a Major Network Operator', *IEEE Africon* 4th *Conference*, Volume 1, 24 - 27 September 1996, Institute of Electrical and Electronics Engineers

Additional References	• ICASA (2004) 'South African Frequency Allocations', Independent Communications Authority of South Africa, Johannesburg • ITU (1998) 'Design Guidelines for Developing Advanced Automated Spectrum Management Systems (ASMS)', International Telecommunication Union, Geneva • Sihag, A & Singh, S (2003) 'Working Paper on Spectrum Management', The Energy and Resources Institute, New Delhi, last seen at http://www.teriin.org/discussion/regu/spectrum.pdf • Sutherland, E (2007) 'European Spectrum Management: Successes, Failures & Lessons', Document no MMSM/03, prepared for ITU Workshop on Market Mechanisms for Spectrum Management, Geneva, 22 - 23 January 2007, International Telecommunication Union, Geneva, available online at http://www.itu.int/osg/spu/stn/spectrum/workshop_proceedings/Background_Papers_Final/Ewan%20Sutherland%20-%20_itu_spectrum_revised.pdf
Activity	
About your Lecturer	Praneel Ruplal is a Senior Manager in the Spectrum Monitoring and Control Department of the Independent Communications Authority of South Africa (ICASA). He has been in the technical regulatory field for 10 years and is a registered Professional Electrical Engineer. Praneel holds a Master of Management Degree in the field of Information Communications Technology, Policy and Regulation – MM(ICTPR) from the University of Witwatersrand. 

Session 9: Frequency Planning and Assignment	
Presenter	Praneel Ruplal
Outcomes	Participants will be able to: • Articulate the objectives and principles of frequency planning and assignment; • Analyse key issues and challenges affecting frequency planning and assignment; • Assess the effectiveness of the regulation and management of spectrum management in South Africa.
Content	• Frequency planning and assignment • Objectives and principles of frequency planning • Planning considerations for radiocommunications services: broadcasting; mobile; satellite • Frequency co-ordination • Interference management • Frequency assignment audit • Spectrum management challenges • Further Studies: independent review of spectrum management in South Africa; new strategic spectrum policies and Issues in South Africa
Core Readings	• Cave, M (2002) Review of Radio Spectrum Management: An independent review for Department of Trade and Industry and HM Treasury, available online at http://www.cochrane.org.uk/inside/uk-radio-spectrum-managment.pdf • Cave, M (2002) 'Spectrum Allocation Controversies', in Mansell, R, Samarajiva, R & Mahan, A (eds) (2002) *Networking Knowledge for Information Societies: Institutions & Intervention*, Delft University Press, available online at http://lirne.net/resources/netknowledge/cave.pdf • ICASA (2010) 'Draft Radio Frequency Spectrum Regulations', Notice 925 of 2010, Government Gazette Vol 543 No 33590, Independent Communications Authority of South Africa, Sandton • ITU (2002) 'Handbook on Spectrum Monitoring', International Telecommunication Union, Geneva, available for sale from http://www.itu.int/publ/R-HDB-23-2002/en • Melody, W (2001) 'Spectrum Auctions and Efficient Resource Allocation: Learning from the 3G Experience in Europe', *info*, Vol 3 No 1, Camford Publishing, Cambridge UK, available online at http://www.ingentaconnect.com/content/mcb/272/2001/00000003/00000001/art00002

Additional References	• Doyle, C & McShane, P (2003) 'On the design and implementation of the GSM auction in Nigeria - the world's first ascending clock spectrum auction', Telecommunications Policy No 27, pp 383 – 405, Elsevier Science, Amsterdam • ICASA (2008) 'Draft South African Table of Frequency Allocations', Notice 890 of 2008, Government Gazette No 31264, Independent Communications Authority of South Africa, Sandton, available online at http://www.info.gov.za/view/DownloadFileAction?id=85964 • ICASA (2003) 'Terrestrial Broadcast Frequency Plan', Government Gazette No 25786, Independent Communications Authority of South Africa, Sandton • ICASA (2008) 'Assignment of the frequency bands where demand exceeds the available bandwidth', General Notice No 748 in terms of the Electronic Communications Act No 36 of 2005, Government Gazette no 31150, Independent Communications Authority of South Africa, Johannesburg, available online at http://llnw.creamermedia.co.za/articles/attachments/14744_gg31150_nn748_pg2-11.pdf • ITU (1998) 'Design Guidelines for Developing Advanced Automated Spectrum Management Systems (ASMS)', International Telecommunication Union, Geneva • Lie E (2004) 'Radio Spectrum Management for a Converging World', International Telecommunication Union, Geneva, available online at http://www.itu.int/osg/spu/ni/spectrum/RSM-BG.pdf • NTIA (2005) 'Procedures and Principles for the Assignment and Coordination of Frequencies', in NTIA (2005) *Manual of Regulations & Procedures for Federal Radio Frequency Managem*ent, National Telecommunications and Information Administration, Washington, DC, available online at http://www.ntia.doc.gov/osmhome/redbook/8.pdf
Activity	
About your Lecturer	See above.