



Swinburne University of Technology
Faculty of Information and Communication Technologies

Unit Outline
HET104 LAN Principles
HET706 Networks and Routing

Semester 1, 2007

Credit Points: 12.5

Duration and Contact Hours: 5 hours per week for one teaching period

Prerequisites: Nil

Learning Objectives:

Students who successfully complete this unit of study will be able to:

- Use the OSI model to describe direct point-to-point data communications.
- Address a network, given a topology and starting IP address.
- Describe basic inter-network processes.
- Explain basic electrical and electronic issues in networks.
- Conduct basic network audits.
- Explain the function of network management tools.
- Build a simple network of hosts, cables, hubs, and routers, at layer 1 level.
- Troubleshoot typical physical problems in a small network.
- Compare and contrast the details of Layers 1, 2, and 3 in the context of Ethernet and IP.
- Compare and contrast the details of Layers 4, 5, 6, 7 in context of TCP
- Compare and contrast LANs and WANs layer by layer.
- Compare and contrast static versus dynamic routing, routed protocols versus routing protocols, and distance vector versus link state routing.
- Describe the internal configuration components of a router, access the router, and test network connectivity.
- Describe and perform a basic router configuration.
- Explain TCP (segment format, port #s, handshakes) and IP (IP datagrams, ICMP, ARP, RARP).
- Address and configure a network.
- Compare and contrast static and dynamic routing, routed and routing protocols, IGPs and EGPs.
- Apply Access Control Lists to a Router

This unit of study provides training to prepare you to sit the external CCNA 640-821 INTRO examination. Although the Cisco Networking Academy Program (CNAP) curriculum is designed around the external certification, a pass in this unit of study is not a guarantee of a pass in the external CCNA exam. You should note that at the time of printing of this handout the pass mark for the external certification exam is approximately 850 out 1000 points.

Please note that the CCNA certification exams are conducted independently of SUT and a fee is charged by the testing body.

Graduate Attributes:

The graduate attributes which relate to this unit of study help to produce graduates who:

- are capable in their chosen professional areas.
- are adaptable and manage change.
- operate effectively in work and community situations.
- are aware of environments.

Engineers Australia Generic Attributes:

- Ability to apply knowledge of basic science and engineering fundamentals;
- In-depth technical competence in at least one engineering discipline;
- Ability to communicate effectively, not only with engineers but also with the community at large;

- Ability to utilise a systems approach to design and operational performance;
- Ability to function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member;
- Ability to understand problem identification, formulation and solution;
- Expectation of the need to undertake lifelong learning, and capacity to do so;

Content:

- Introduction to networking
- Networking fundamentals
- Networking media
- Cabling testing
- Cabling LANs and WANs
- Ethernet fundamentals, technologies, and switching
- TCP/IP
- Routing fundamentals
- WANs and routing
- Configuring a router
- Learning about other devices
- Managing Cisco IOS Software
- Routing and routing protocols
- Distant vector protocols
- TCP/IP error messages
- Basic router troubleshooting
- Access control lists

Teaching Method:

Lecture: 1 hour per week

Tutorial: 1 hour per week

Laboratory: 3 hours per week

You should normally expect to spend, on average, twelve and a half hours of total time (formal contact time plus independent study time) a week on a 12.5 credit point subject.

Assessment:

Pass Requirement: To pass this unit of study, a student must achieve a total overall mark of 50% or more and students must achieve the minimum required pass marks outlined in the table below for each Major Assessment Component. This unit of study has a strong industry-based focus and requires students to reach a necessary level of competency in the "hands-on" training and use of Cisco equipment, and both its content and assessment tasks are designed accordingly.

In general a Major Assessment Component carries a weighting of at least 15% of the total mark available.

CNAP Final Semester Tests:	20% MAC
Case Study:	10%
Lab Exam:	20% MAC
Examination (2 hours):	50% MAC

Assessment Criteria

Assessment Component	Minimum mark required to be eligible for a pass in this unit
CNAP Individual Module Tests (Major Assessment Component)	Students MUST attempt a minimum of 10 of the 20 module tests throughout the semester
CNAP Sem 1 Final Test (Major Assessment Component)	60%
CNAP Sem 2 Final Test (Major Assessment Component)	60%
Lab Exam (Major Assessment Component)	100%
Final Written Exam (Major Assessment Component)	40%

You must pass all individual assessment components to be considered for a pass in the unit of study. If any of the requirements in the table is not met then a maximum overall mark of 45% will be given for this unit. Note that to progress from CNAP semester 1 to CNAP semester 2 you MUST obtain a minimum of 60% for the CNAP Semester 1 final test.

CNAP Individual Module Tests:

- On-line test as per the Cisco Networking Academy Program.
- Results of tests will not form part of the final assessment
- Test feedback to be used for continuing study purposes
- A minimum of ten tests must be attempted in order to be eligible to pass this Unit.

CNAP Final Semester Tests:

- On-line test as per the Cisco Networking Academy Program.
- You will be given a maximum of 2 attempts for each online final exam. You must obtain a mark of 60 or higher to pass. Where a second attempt is made at the online final exam the maximum mark for the exam will be 60%
- Preparation for the CNAP Final Semester tests are via the continuous online CNAP Module Tests made available as per the tutorials in the schedule below.
- Dates: as per schedule below.

Case Study

- Details to be issued during teaching period. Assessment is based on a group written report.
- The case study report must be submitted in a hard copy format with a cover sheet, which is obtainable in this unit outline
- Submission date: During your allocated Lab Session – Week 12

Lab Exam:

- 'Closed book' Practical exam to be held at the end of the teaching period during the examination period. You will be given a maximum of 2 attempts for the lab exam. Where a second attempt is made at the lab exam the maximum mark for the exam will be 50%.

Final written exam:

- Two hour, 'closed book' exam covers both semesters 1 & 2 of the CNAP, to be held at the end of teaching period during the examination period.

Note:

All CNAP module tests for this unit of study are taken on-line. Students are NOT allowed to bring ANY unauthorised material into the testing room. During the any on-line examination/test session students are ONLY allowed to have 1 Web Browser window and no calculator window open. In addition students must have the windows task bar visible at ALL times.

Dictionaries, Mobile Phones, personal organisers and personal computers are NOT permitted in the exam or test.

The Swinburne Written Final Exam is taken during the normal examination period. Students are NOT allowed to bring ANY material into the exam, except for writing implements.

In order to graduate in the CNAP you must pass the Case Study, Lab exam and final on-line tests. The minimum mark to be eligible for a pass for the individual assessment components is outlined below:

Required Test Books

“Cisco Networking Academy Program CCNA 1 Networking Basics Companion Guide” Cisco Press 2007

“Cisco Networking Academy Program CCNA 2 Routers and Routing Basics Companion Guide” Cisco Press 2007

References:

“Cisco Networking Academy Program CCNA 1 Networking Basics Labs and Study Guide” Cisco Press 2007

“Cisco Networking Academy Program CCNA 2 Routers and Routing Basics Labs and Study Guide” Cisco Press 2007

“CCNA Self-Study CCNA Portable Commands Guide”, Scott Empson, Cisco Press 2006

Provisional Outline:

Week No	Week Start	Lecture / Topic	Lab Lab Book No.	Tutorial/Online Testing
1	26/2	Unit Structure Binary Number Systems	Binary number exercises Introduction to network equipment and cabling	No tutorials
2	5/3	IP Addresses IP Addressing	2.2.4, 2.2.1, 2.2.9, 3.1.2, 3.1.3	Web Site Account Registration
3	12/3	Routing Principles Subnet Masks	3.1.4, 3.1.5, 3.1.6, 3.1.7, 3.2.5, 3.2.7, 3.2.9	CCNA1 Module 1 CCNA1 Module 2 CCNA1 Module 3
4	19/3	IP Subnetting	IP Addressing Workbook 4.2.2, 4.2.3, 4.2.5a, 4.2.5b, 4.2.6	CCNA1 Module 4 CCNA1 Module 5 CCNA1 Module 6/7
5	26/3	IP Subnetting	IP Addressing Workbook 5.1.5, 5.2.3, 5.2.6a	CCNA1 Module 8 CCNA1 Module 9/10 CCNA1 Module 11
6	2/4	Router Functionality Routing Tables	6.1.6 Configuring RIP on routers 7.2.2, 7.2.6, 7.2.7, 7.3.6	CCNA1 Final Test
	9/4	Split Week – Easter Break HET706 Lecture on 11/4 to make up for ANZAC Day		(No Teaching)
7	16/4	Access Control Lists	9.1.1, 9.1.2, 9.2.6, 9.3.4, 9.3.5	CCNA2 Module 1 CCNA2 Module 2
8	23/4	Access Control Lists Wednesday April 25 ANZAC Day	ACL Workbook 11.2.1b, 11.2.2.b, 11.2.3a	CCNA2 Module 3 CCNA2 Module 4 CCNA2 Module 5
9	30/4	Access Control Lists	ACL Workbook 11.2.3b, 11.2.3c, 11.2.6	CCNA2 Module 10 CCNA2 Module 11
10	7/5	Routing Protocols	Challenge Lab	CCNA2 Module 8 CCNA2 Module 9
11.	14/5	Routing Protocols	RIP Functionality review Challenge Lab	CCNA2 Module 6 CCNA2 Module 7
12	21/5	Review	Challenge Lab	CCNA2 Final Test

Convenor: Dr. Jason But**Room:** EN606e**Telephone:** 9214 4839**E-mail:** jbut@swin.edu.au**Consultation times:** Only via email appointment

Other Staff:

TBA See Blackboard for details

Special InformationUnit Blackboard Site

This unit of study will utilise the Blackboard system for web access to learning material such as sample files for laboratory activities, lecture materials, recommended web sites, examination information, assignment handouts and other important information. See <http://mysubjects.swin.edu.au>

CCNA Certification

If you wish to sit the Cisco certification exam 640-821 INTRO at an authorised Cisco Testing Centre, you can find more details at <http://www.2test.com>. The exam costs approx \$150 per attempt. Note that the CCNA exams are conducted independently of SUT.

Remote Access Resources

FICT has recently deployed a remote-access equipment rack and curriculum server for student use called Netlab. Netlab is accessible 24 hours a day, both internally from Swinburne and externally from home via dial-up or the internet. To obtain external access the student will need to install a VPN client. The VPN installation details are available on the blackboard website for this unit.

The Netlab server provides students with access to the Cisco online curriculum, as well as several pre-cabled lab topologies for practicing the laboratory exercises. The lab component of Netlab is live and uses

real routers and switches rather than just a simulation. Lab usage is based on reservations, so students may need to book in advance if demand becomes high during the teaching period. Bookings, curriculum access and the online labs are all found at the URL <http://netlab4swin/> or <http://136.186.4.19> or <http://netlab4swin/>

Accessing On-Line Materials:

The on-line study material for this unit of study can be accessed using the World Wide Web at the following URL: <http://netlab4swin/> and <http://cisco.netacad.net>. Please note that to access the Netlab server you will have to run a VPN client on your PC. This can be downloaded from the blackboard website, along with a complete set of instructions of how to install it and make it work.

The on-line chapter tests can be accessed at URL <http://cisco.netacad.net> only.

To access Netlab you will use your Student ID as the login name and the initial password as outlined on blackboard.

Copyright Notice:

A condition of the use of the CNAP material is that none of it (including the CISCO logo) be printed nor copied in any form, in part or full, as the material is subject to copyright. Any student breaking this condition will be subject to strong disciplinary action as determined by the panel in accordance with the University Statutes and Guidelines concerning the assessment and appeals. Note the action may result in expulsion from the course and/or failure in the unit.

Assessment Details and Regulations

Attendance Requirements:

Students are expected to attend all scheduled classes for the subject.

Assessment Moderation:

Students should be aware that the marks awarded during semester and for the final examination may be subject to moderation.

Students with Special Needs

Students with special needs should advise the Faculty of ICT office (AD building), the Equity Office and the subject convener.

Assignment/Project Submission:

Assignments may be submitted on-line or in hardcopy as indicated by the Unit Convenor. Assignments submitted in hardcopy must be submitted in an A4 folder or envelope, with a copy of the Assignment Cover Sheet *fixed securely to the outside on the front of the folder/envelope*. *Assignments submitted without the cover sheet will not be marked*. All disks should be placed in an envelope and secured to the assignment folder. Assignments should be placed in the Assignment Box next to the enquiry window of the Faculty of ICT Office, Level 1 AD Building. This box is emptied once daily, at 8.30am and the front cover sheet is date stamped. Part-time students may therefore need to submit their assignments the night before the due date. Students should keep a spare copy of each assignment, as a safeguard in disputes over missing assignments. If work on a floppy disk is to be submitted, students should submit a backup disk, in case the first is faulty. In the case of later submissions of replacement disks, the whole assignment will be treated as 'late'.

In the case of group assignments, group members are indicating, by signing the cover sheet, that they agree that each member of the group made a fair and reasonable contribution. In cases of doubt or dispute, individual members of the group may be required to undergo an oral examination regarding their contribution to the assignment or project.

Assignments or projects submitted after the due date and time will attract a penalty of 10% of the total marks available per working day late, up to a maximum of five working days. Assignments submitted after five working days will be graded with zero marks.

Extensions will only be granted in exceptional circumstances, on medical or compassionate grounds. Extensions must be applied for in advance of the due date (except in emergencies). Students should contact the convenor by phone, email or in person to apply for an extension. Medical or other certificates will be required. The convenor must sign the bottom of the assignment cover sheet when approving the extension.

Assessment and Appeals Procedures:

Students are referred to the Swinburne Web Site <http://www.swin.edu.au> where they will find for details of the University's Assessment and Appeals Procedures.

Assessment Irregularity:

Cheating and plagiarism are major infringements of the University's academic values.

"An irregularity is the unauthorised use or attempted use by or for any student of any means to gain unfair advantage in any examination, test, assignment, essay, performance, exhibition, or other work, the marks for which form part of the final assessment. It includes any action taken by a student which would constitute an unfair advantage or fraudulent attempt to demonstrate competency in an examination or assessment context. An irregularity includes misconduct and plagiarism."

"Misconduct includes an action by a student which is in breach of any directions issued by the Examination Room Supervisor, printed on the examination material or notices or specified by the Assessment and Appeals Procedures. This includes taking into an examination any unauthorised material with the intention of using said material to obtain an unfair advantage."

"Plagiarism" is the action or practice of taking and submitting or presenting the thoughts, writings or other work of someone else as though it is your own work.

Plagiarism includes any of the following, without full and appropriate acknowledgment to the original source(s):

- (a) the use of the whole or part of a computer program written by another person;
- (b) the use, in essays or other assessable work, of the whole or part of a written work from any source including but not limited to a book, journal, newspaper article, set of lecture notes, current or past student's work, any other person's work, a website or database;
- (c) the paraphrasing of another's work;
- (d) the use of musical composition, audio, visual, graphic and photographic models,
- (e) the use of realia, that is objects, artefacts, costumes, models and the like.

Plagiarism also includes the preparation or production and submission or presentation of assignments or other work in conjunction with another person or other people when that work should be your own independent work. This remains plagiarism whether or not it is with the knowledge or consent of the other person or people. It should be noted that Swinburne encourages its students to talk to staff, fellow students and other people who may be able to contribute to a student's academic work but that where independent assignment is required, submitted or presented work must be the student's own.

Enabling plagiarism contributes to plagiarism and therefore will be treated as a form of plagiarism by the University. Enabling plagiarism means allowing or otherwise assisting another student to copy or otherwise plagiarise work by, for example, allowing access to a draft or completed assignment or other work.

Cases of examination or assessment irregularities will be dealt with according to the provisions of Section 9 of the Assessment and Appeals Policy and Procedures. Penalties for assessment irregularities can be severe, including failure of subject or exclusion from the course.

Retention of Assessed Materials

You **MUST** retain all assessed material that contributes to the final grade up until such time as the final grades are promulgated. The assessment material must, after a reasonable time, be produced on demand for review by the Faculty. Non-compliance with this requirement may result in loss of all credit for the assessed material not so produced.

Publication of in-semester assignment marks.

The Faculty of Information and Communication Technologies undertakes to publish marks for work submitted during the semester (typically assignments and lab tasks) no later than two weeks after the due date or date of submission, whichever is greater. Note that final assignment or examination results will not normally be published. Contact the teaching staff member responsible for your assessment, or the subject convener if your marks have not been published in a timely manner.

Safety Standards and Regulations:

The University executes safety drills without warning. Be prepared to follow instructions from staff and/or wardens to evacuate the building in a safe and orderly manner.)

Eating, drinking or smoking in the laboratories is not allowed. For your own safety, bare feet, thongs and other open sandals are forbidden in certain laboratories. A mature, sensible attitude and a healthy respect for the equipment are always required. Juvenile, ill-mannered or reckless behaviour will not be tolerated, and the laboratory supervisor has the right to exclude students from the laboratory should their behaviour constitute a danger to themselves or to others. Such behaviour would result in forfeiture of all marks for that experiment. The playing of computer games is not allowed in the computer labs.

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ASSIGNMENT AND PROJECT COVER SHEET

Unit Code: HET104 Unit Title: _____ LAN Principles
Assignment number and title: _____ Due date: _____
Lab/tute group: _____ Tutor: _____ Lecturer: _____

Family name: _____ Student ID: _____
Other names: _____

To be completed if this is an individual assignment

I declare that this assignment is my individual work. I have not worked collaboratively nor have I copied from any other student's work or from any other source except where due acknowledgment is made explicitly in the text, nor has any part been written for me by another person.

Signature: _____

To be completed if this is a group assignment

We declare that this is a group assignment and that no part of this submission has been copied from any other student's work or from any other source except where due acknowledgment is made explicitly in the text, nor has any part been written for us by another person.

ID Number	Name	Signature
_____	_____	_____
_____	_____	_____
_____	_____	_____

Marker's comments:

Total Mark: _____

Extension certification:

This assignment has been given an extension and is now due on _____

Signature of Convenor: _____