

**FIT2019**  
**Network standards and specifications**

**Unit Guide**

**Semester 2, 2010**

The information contained in this unit guide is correct at time of publication. The University has the right to change any of the elements contained in this document at any time.

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# Table of Contents

<b><u>FIT2019 Network standards and specifications - Semester 2, 2010</u></b>	<b>1</b>
Chief Examiner:	1
Lecturer(s) / Leader(s):	1
Caulfield	1
Malaysia	1
Introduction	2
Unit synopsis	2
Learning outcomes	2
Contact hours	2
Workload	2
Unit relationships	3
Prerequisites	3
Teaching and learning method	4
Teaching approach	4
Timetable information	4
Tutorial allocation	4
Unit Schedule	4
Unit Resources	6
Prescribed text(s) and readings	6
Recommended text(s) and readings	6
Required software and/or hardware	6
Equipment and consumables required or provided	7
Study resources	7
Assessment	8
Overview	8
Faculty assessment policy	8
Assignment tasks	8
Examination	10
Due dates and extensions	10
Late assignment	11
Return dates	11
Feedback	11
Appendix	12

# **FIT2019 Network standards and specifications - Semester 2, 2010**

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## Introduction

Welcome to FIT2019 Network Standards and Specifications. This unit examines the use of standards for data communications and networking protocols, and the software environments that form the basis of modern computer networks. Methods by which these standards are developed and promulgated are studied as well. This unit will also enhance the choice of network specialisation study within the undergraduate degrees offered by the Faculty of Information Technology.

## Unit synopsis

This unit introduces the idea of standards and the standardisation process within the networking and data communications area. It follows on from the core unit [FIT1005 Networks and Data Communications](#) with a focus on the: types of standards commonly found in information technology; creation, application and maintenance of networking standards; network protocol families, their interdependencies and sequence of development; methods used to define and maintain standards; composition and operation of the various national and international standards organisations; review of some key networking protocol standards and implementation issues.

## Learning outcomes

At the completion of this unit students will:

- have detailed understanding of families of network protocols and their interdependencies, and developed skills in their application;
- understand the historical development of key internet protocols;
- be familiar with the source documents and specifications used to define key internet protocols, and developed skills in their usage;
- be familiar with the common methods used to define and promulgate network protocols
- be able to identify the national and international organisations whose roles involve the formation of standards in this area;
- be able to comprehend the notation used in network standard definitions including formal data and structure definition languages such as EBNF, ASN.1, SGML or XML, and developed skills in using this notation;
- have practical experience of methods used to capture and analyse network protocol packets.

## Contact hours

2 hrs lectures/wk, 2 hrs laboratories/wk

## Workload

For on campus students, weekly workload commitments are:

- a two-hour lecture and
- a two-hour tutorial (with laboratory work) requiring advance preparation
- a minimum of 2-3 hours of personal study per one hour of contact time in order to satisfy the reading and assignment expectations.
- You may need to allocate up to 5 hours per week in some weeks on the computer, preparing essays, programming or experimenting with software, or engaging in discussion groups, whether online or offline.

Off-campus students generally do not attend lecture and tutorial sessions. However, you should plan to spend equivalent time working through the relevant resources and participating in discussion groups each week.

## **Unit relationships**

### **Prerequisites**

FIT1005 or CSE2318 or CSE3318 or equivalent

## Teaching and learning method

### Teaching approach

FIT2019 uses a lecture-tutorial teaching approach.

Each lecture will discuss the week's theoretical concepts and will also go through specific examples and demonstrations.

In tutorials, students will discuss in-depth fundamental aspects about networks and data communications and apply their understanding to practical examples. The tutorials are critical in helping student consolidate concepts and practice their problem solving skills.

Tutorials will at times involve hands-on laboratory activities. A few short assessments with both theoretical and practical components can also be expected during some tutorials.

### Timetable information

For information on timetabling for on-campus classes please refer to MUTTS,  
<http://mutts.monash.edu.au/MUTTS/>

### Tutorial allocation

On-campus students should register for tutorials/laboratories using the Allocate+ system:  
<http://allocate.its.monash.edu.au/>

### Unit Schedule

Week	Date*	Topic	Key dates
1	19/07/10	Introduction and Review	No Tutorial in Week 1
2	26/07/10	Network Protocols	Tutorials start this week
3	02/08/10	Layered Protocols	
4	09/08/10	Data Notation Standards	Tutorial Quiz 1
5	16/08/10	State Transitions and State Machines	
6	23/08/10	History of the Internet, the Evolution of Standards, and Standards Organizations	Tutorial Quiz 2
7	30/08/10	Physical Layer Standards	
8	06/09/10	Network Access Layer Standards.	
9	13/09/10	Internet Layer Standards	Tutorial Quiz 3
10	20/09/10	Transport Layer Standards	
Mid semester break			
11	04/10/10	Application Layer Standards	
12	11/10/10	Routing and Other Network Standards	Assignment Due
13	18/10/10	Revision	Tutorials for revision

\*Please note that these dates may only apply to Australian campuses of Monash University. Off-shore students need to check the dates with their unit leader.

## Unit Resources

### Prescribed text(s) and readings

Douglas E. Comer, *Internetworking with TCP/IP: Principles, Protocols and Architecture*, Vol. 1, 5E, Pearson Prentice Hall, 2006, ISBN 0-13-198069-6.

### Recommended text(s) and readings

The following are additional references for particular topics that will also be covered beyond the prescribed textbook above:

William Stallings. "Data and Computer Communications" 8E, Prentice Hall (2007).

Uyless Black. "Computer Networks: Protocols, Standards and Interface" 2E, Prentice Hall (1993).

William Stallings. "Wireless Communications & Networks" 2E, Prentice Hall (2004).

Cisco Systems Inc. "Internetworking Technologies Handbook" 4E, Cisco Systems (2004).

P.Loshin. "Essential Ethernet standards: RFCs and protocols made practical", Wiley (2000)

P.Loshin. "Big Book of Lightweight Directory protocol", Morgan-Kaufmann (2000)..

M.C.Libicki. "Information Technology Standards: Quest for the Common Byte". Butterworth-Heinemann (1995).

M.C.Libicki, J.Schneider, D.R.Frelinger, A.Slomovic. "Scaffolding the New Web: Standards and Standards Policy for the Digital Economy" Rand MR-1215-OSTP (2000).  
<http://www.rand.org/publications/MR/MR1215> .

S.Bradner. "The Internet Standards Process - Revision 3", Internet Engineering Task Force, RFC 2026, October 1996. <http://ftp.monash.edu.au/pub/rfc/rfc/rfc2026.txt> .

J.B.Postel and J.F.Reynolds. "Internet Official Protocol Standards", Internet Engineering Task Force, RFC 2300, May 1998. <http://ftp.monash.edu.au/pub/rfc/rfc/rfc2300.txt> .

S.Dawkins, Charles.E.Perkins, and D.H.Crocker, "Two Stage Standardization Approach", Internet Engineering Task Force. <http://tools.ietf.org/html/?draft=draft-dawkins-pstmt-twostage>

### Required software and/or hardware

You will need access to:

- Knoppix live Linux (boots from CD). The ISO image may be downloaded from <http://www.knopper.net/knoppix/index-en.html> and then burned into a CDROM. [Warning: improper use of Knoppix may damage the contents of your hard drive.]
- Wireshark, a protocol analyzer, which may be used to capture packets for analysis. It may be downloaded from <http://www.wireshark.org/download.html>.

All the above may be obtained from home and used on the home computer -- but be careful with Knoppix (as indicated above). Wireshark and other packet sniffers must never be used for malicious purposes in



capturing data in transit.

On-campus students will find and use Knoppix and Wireshark only in the designated Data Communications lab for the tutorials. They should never be used in the other labs without authorization from academic staff. PDFCreator may be available on PC labs of your campus.

## **Equipment and consumables required or provided**

On-campus students may use the facilities available in the computing labs. Information about computer use for students is available from the ITS Student Resource Guide in the Monash University Handbook. You will need to allocate up to 8 hours per week for reading and private study, including computer time for email and online discussion groups.

Apart from the general computing labs referred to above, students will be provided with ample time to experiment with protocols during tutorials in the Data Communications lab.

## **Study resources**

Study resources we will provide for your study are:

- This Unit Information guide outlining the administrative information for the unit
- The FIT2019 web site on MUSO, where lecture slides, weekly tutorial requirements, assignment specifications, sample solutions and supplementary material will be posted.
- Web-based discussion groups that can be accessed from the FIT2019 unit Homepage

## Assessment

### Overview

Examination (3 hours): 60%; In-semester assessment: 40%

### Faculty assessment policy

To pass a unit which includes an examination as part of the assessment a student must obtain:

- 40% or more in the unit's examination, and
- 40% or more in the unit's total non-examination assessment, and
- an overall unit mark of 50% or more.

If a student does not achieve 40% or more in the unit examination or the unit non-examination total assessment, and the total mark for the unit is greater than 50% then a mark of no greater than 49-N will be recorded for the unit.

### Assignment tasks

#### Assignment coversheets

Assignment coversheets are available via "Student Forms" on the Faculty website:

<http://www.infotech.monash.edu.au/resources/student/forms/>

You MUST submit a completed coversheet with all assignments, ensuring that the plagiarism declaration section is signed.

**Assignment submission and return procedures, and assessment criteria will be specified with each assignment.**

Assignment submission and preparation requirements will be detailed in each assignment specification. Submission must be made by the due date otherwise penalties will be enforced. You must negotiate any extensions formally with your campus unit leader via the in-semester special consideration process: <http://www.infotech.monash.edu.au/resources/student/equity/special-consideration.html>.

#### • Assignment task 1

**Title:**

Tutorial Quiz 1

**Description:**

This 30-minute quiz covers topics from the lectures of Weeks 1 through 3, and from tutorials in Weeks 2 and 3. The quiz contains multiple choice questions, practical problem solving questions, and possibly some essay type questions.

**Weighting:**

5%

**Criteria for assessment:**

Correct answers to the questions and compliance with exercise tasks to be assessed.

**Due date:**

Week 4 tutorial

- **Assignment task 2**

**Title:**

Assessable Tutorial Quiz 2

**Description:**

This 30-minute quiz covers materials from lectures and tutorials from Weeks 4 and 5. The format includes multiple choice questions, practical problem solving, as well as short essay questions.

**Weighting:**

5%

**Criteria for assessment:**

Correct answers to the questions and compliance with exercise tasks to be assessed.

**Due date:**

Week 6 Tutorial

- **Assignment task 3**

**Title:**

Assessable Tutorial Quiz 3

**Description:**

This 30-minute quiz covers materials from lectures and tutorials from Weeks 6 through 8. The format includes multiple choice questions, practical problem solving, as well as short essay questions.

**Weighting:**

5%

**Criteria for assessment:**

Correct answers to the questions and compliance with exercise tasks to be assessed.

**Due date:**

Week 9 Tutorial

- **Assignment task 4**

**Title:**

Research Project on a Specific Network Standard

**Description:**

Students will individually conduct an in-depth study of a standard network protocol or family of protocols. The assignment is designed as a research paper, and encourages practical experimentation.

The study should involve extensive reading, testing of prototypes which are generally available for free under various platforms, and must involve packet analysis as a validation of expected behavior. Students will also be encouraged to practice protocol verification and critiquing.

**Weighting:**

25%

**Criteria for assessment:**

The papers will be assessed based on how well the student appears to have understood the protocol or family of protocols. This will be based on the extensiveness of the study as reported in the assignment.

**Due date:**

Friday of Week 12 - 15th October, 2010 - 4 pm

**Remarks:**

Submission of the report is in two modes:

- ◆ electronic, as a PDF or .doc file, via Damocles,  
<http://viper.infotech.monash.edu.au/damocles/submit/>
- ◆ **and by printout**, with a filled in and signed cover sheet. The printout and coversheet must be submitted via labelled boxes in the School office.

Students should consult the Faculty's general style guide:

<http://www.infotech.monash.edu.au/resources/student/assignments/caulfield-styleguide.pdf>

Students should note that plagiarism is not acceptable. Please respect the intellectual property of authors whose work will form the basis of your research paper. Good technical writing, concise and respectful of IP, is a skill that can be learned. Reading resources to guide students in proper citation will be made available among this unit's course materials. The university library provides Learning Skills advisers for drop-in sessions during semester, as well as a Learning Skills Online website, to assist students who are willing to seek assistance. For more information, please visit this site:

<http://www.lib.monash.edu/learning-skills/>

## Examination

- **Weighting:**  
60%
- Length:**  
3 hours
- Type (open/closed book):**  
closed book
- Electronic devices allowed in the exam:**  
None

**See Appendix for End of semester special consideration / deferred exams process.**

## Due dates and extensions

Please make every effort to submit work by the due dates. It is your responsibility to structure your study program around assignment deadlines, family, work and other commitments. Factors such as normal work pressures, vacations, etc. are not regarded as appropriate reasons for granting extensions. Students are advised to NOT assume that granting of an extension is a matter of course.

Students requesting an extension for any assessment during semester (eg. Assignments, tests or presentations) are required to submit a Special Consideration application form (in-semester exam/assessment task), along with original copies of supporting documentation, directly to their lecturer within two working days before the assessment submission deadline. Lecturers will provide specific outcomes directly to students via email within 2 working days. The lecturer reserves the right to refuse late applications.

A copy of the email or other written communication of an extension must be attached to the assignment submission.

Refer to the Faculty Special consideration webpage or further details and to access application forms:  
<http://www.infotech.monash.edu.au/resources/student/equity/special-consideration.html>

## **Late assignment**

Assignments received after the due date will be subject to a penalty of 5% per day or part thereof including Saturday and Sunday.

Assignments received later than one week after the due date will not normally be accepted.

## **Return dates**

Students can expect assignments to be returned within two weeks of the submission date or after receipt, whichever is later.

## **Feedback**

Types of feedback you can expect to receive in this unit are:

Informal feedback on progress in labs/tutes

Graded assignments with comments

Test results and feedback

Quiz results

Solutions to tutes, labs and assignments

## Appendix

Please visit the following URL: <http://www.infotech.monash.edu.au/units/appendix.html> for further information about:

- Continuous improvement
- Unit evaluations
- Communication, participation and feedback
- Library access
- Monash University Studies Online (MUSO)
- Plagiarism, cheating and collusion
- Register of counselling about plagiarism
- Non-discriminatory language
- Students with disability
- End of semester special consideration / deferred exams