FIT9137
Introduction to Computer Architecture and Networks

Admin Overview

Dr Muhammed Esgin

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600 hours of video uploaded to YouTube every minute

3.07 billion daily active users on Facebook

225 exabyte of worldwide Internet traffic per month

5.0 trillion US$ in online sales expected in 2023

About Muhammed

- **Dr. Muhammed Esgin - Chief Examiner**
- Senior Lecturer at Faculty of IT
- Research: Mathematical aspects of cybersecurity, mainly around cryptography
- Cybersecurity Lab
- Website: mfesgin.github.io

Muhammed's Research

- Privacy-enhancing technologies: building tools to process information without harming privacy

- Quantum-resistant cryptography: building cryptographic tools resistant to even powerful quantum computers

- If interested, watch "How Quantum Computers Break The Internet... Starting Now"

  https://www.youtube.com/watch?v=-UrdExQW0cs

About Safi

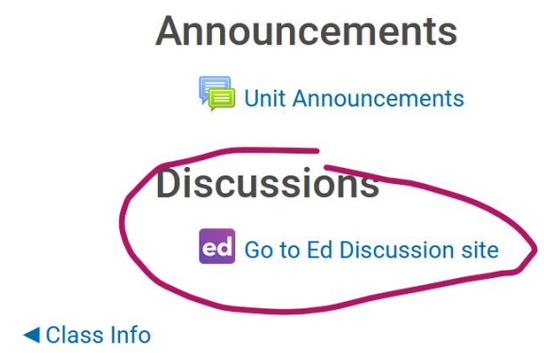
- **Safi Uddin**
- Unit Coordinator and Lecturer of FIT9137 for S2 2025
- Teaching FIT9137 for past 7 years.
- Passionate about Computer Systems and Networks. Background is in Electrical and Computer Systems Engg.
- Research done in: TCP Congestion Control. Protocol Stack Enhancement in OMNeT++. Use of Fuzzy Logic in Congestion Control.

Teaching team introductions

Contact

- Muhammed Esgin (CE)
- Safi Uddin (UC, Lecturer) Safi.Uddin@monash.edu
- Fatima Seeme (Admin tutor) fatima.seeme@monash.edu

- All staff info: https://learning.monash.edu/course/view.php?id=34622&section=5
- From Moodle access Ed Discussion platform
- We try to reply within 48 (working) hours
- **Important:**
  Only use your Monash email address!
  Don't post answers to assignments in any forums!



Learning Outcomes

At the completion of this unit, students should be able to:

1. Describe basic concepts of computer hardware and software architectures;
2. Describe data representations, and basic computing and systems operations;
3. Explain the three major functions of an operating system (OS), namely, process management, memory management, and file management;
4. Analyse and formulate the functions and architectures of (wireless) local area networks, wide area networks and the Internet;
5. Examine networks using the underlying fundamental theories, models and protocols for data transmission;
6. Identify cybersecurity threats and ethical considerations in the Internet;
7. Apply and implement cybersecurity enabling techniques and countermeasures such as virtual private networks (VPN).

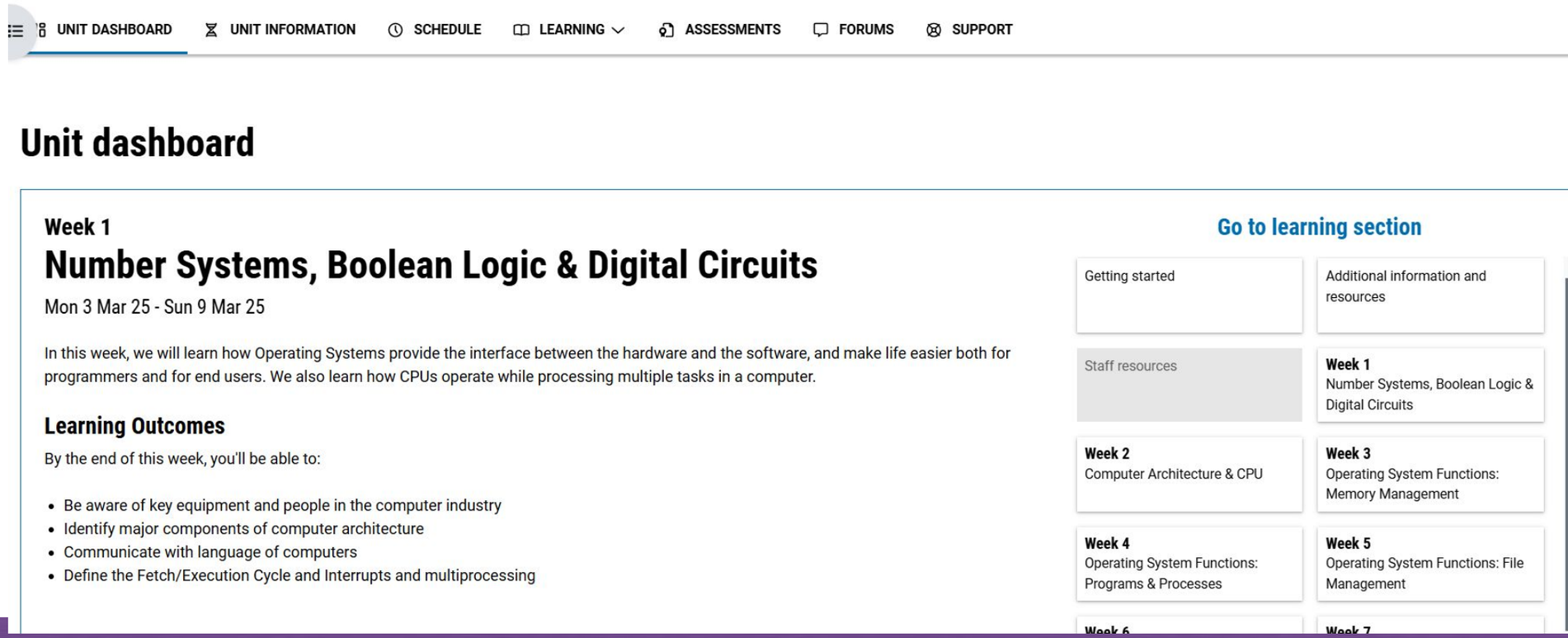
FIT9137 Teaching Model

	Traditional teaching	**Ed transformation - FIT9137**	**Moodle description**
Conceptual learning	Lectures	Pre-class activities (MANDATORY)	Own-time
Exercises	Labs	Workshop & Applied	Real-time
Reinforcing learning	Own efforts?	Post-class activities	Wrap up
Assessments	Written tests/exams	Authentic (take-home) - NO final exam	See “Assessments” section

Resources

Moodle Website

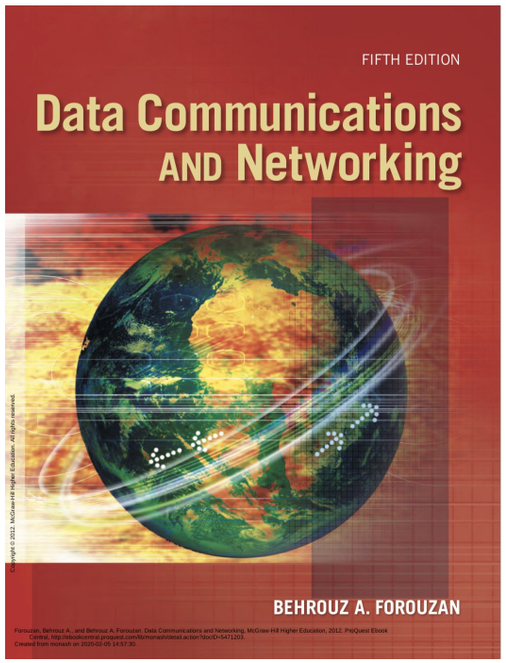
- **Pre-class material** to prepare for the concepts and theory will be available for each week
- **In-Class Activities:** Applied, Workshop, Workshop slides and software downloads
- **Post-Class Activities:** Weekly Quizzes: open during for one week only (Not assessed) & **Brief** reading of Book chapters
- **Assessments:** Assessment 1, Assessment 2 (Quiz) & Assessment 3
- **Discussion Forum**: “Ed”



LIVE MOODLE

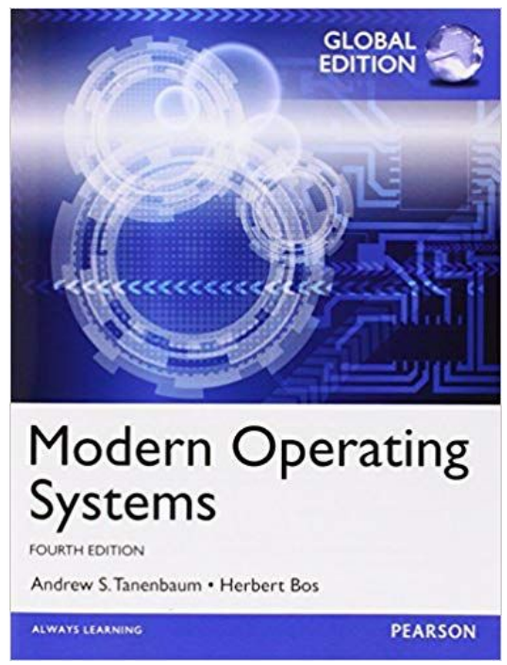
OVERVIEW

No Prescribed Textbook



Data Communications & Networks
Forouzan, Behrouz A.
5th Edition
McGraw-Hill, 2013

Modern Operating Systems
Tanenbaum, Andrew
4th Edition
Pearson, 2014



Online Access through Monash Library Portal.

Assessment

Assessment

Moodle demo

Extension & Special Considerations

- All requests must be submitted to the central system

  https://www.monash.edu/students/admin/assessments/cant-complete

- Please do **not** contact a teaching team member via email to request extension/special consideration

- When submitting a request from the system, you will need to select an assessment task pre-populated from Moodle.

Unit Schedule

Week 1 - Number Systems, Boolean Logic & Digital Circuits

Week 2 - Computer Architecture & CPU

Week 3 - Operating System Functions: Memory Management

Week 4 - Operating System Functions: Programs & Processes

Week 5 - Operating System Functions: File Management

Week 6 - Introduction to Computer Networks

Week 7 - LANs, MANs, WANs & WLANs

Week 8 - Physical Layer and Data Link Layer

Week 9 - Network & Transport Layer

During the break

Week 10 - Application Layer

Week 11 - Network Security

Week 12 - The Internet

If you have a question

- First, search for an answer in Ed forum,
- Then, ask tutors/workshop leads during an applied/workshop session or consultation
- If your question concerns FIT9137 students generally, then use Ed forum
- If still have a question, email **Safi Uddin** with the subject line labelled as [FIT9137]
  e.g., [FIT9137] Question about Assignment 1

Consultation Sessions

- Several 1-hour sessions/week available for you to attend.
- Schedule and details are in the Moodle under “Additional Information and Resources”, section.
- Ask the tutors your question concerning any FIT9137 topic in particular and your study in general.
- Use these sessions to have an informal discussion about any topic even though you may not have any particular question.

Peer instruction and PollEv

- During the workshops we will do some polls
- Formative assessment and better learning experience
- They are not part of overall marks
- They help you check if you've understood
- They help us adapt the pre-recorded lecture videos

Setting up PollEv

1. Visit the URL on the slide via
   - your phone, tablet or laptop (you can scan the QR code)
   - each poll has its unique URL/QR code OR
   - Visit https://pollev.com/safiuddin051
2. Answer questions when they pop up

PollEv Question 1

Q: What does TCP/IP stand for?

A. **T**ransa**C**tion **P**rotocol / **I**nternal **P**rotocol

B. **T**ransport **C**apacity **P**lanner / **I**nternet **P**lanner

C. **T**ransmission **C**ontrol **P**rotocol / **I**nternet **P**rotocol

D. **T**ranslation **C**omputer **P**rogram / **I**nternet **P**rogram

E. **D**on’t know?!

https://PollEv.com/multiple_choice_polls/5CmHyR7eiegprnyr2Sthe/respond

PollEv: Your background

What is your background with respect to IT?

A. No previous IT knowledge

B. Some experience but no formal education in IT

C. Bachelor's degree in IT

D. Bachelor's degree in Engineering, Math's.. etc.

E. Bachelor's degree in Non-IT or Non-Engineering etc..

https://PollEv.com/multiple_choice_polls/ETOqj5dcoE8PMqFyM2ltI/respond

How do we use PollEv?

- **During the workshops:** 3-4 questions
  - if almost everyone gets the right answer, we go on
  - if most people get it wrong, I'll explain
  - if it's a mixed response, you discuss with your neighbours and then vote again

Academic Integrity

- **Integrity of Your Work - Very Very Important.**
- Read the Monash Academic Integrity policy here (see Moodle)
- Monash takes this very seriously.
- Examples for breaching of academic integrity:
  copy & paste answers to assignments, working together on tasks that require individual submissions etc.

Academic Integrity

Academic integrity

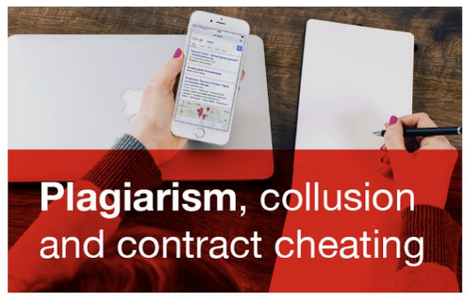
All Australian Universities have policies that explain academic integrity at that institution. The Monash Academic Integrity Policy (2013) states:

"Academic integrity is the moral code of academia. It involves using, generating and communicating information in an ethical, honest and responsible manner."

What is academic integrity?

Duration: 10 minutes

Find out more



Plagiarism, collusion and contract cheating

Duration: 15 minutes

Find out more

Putting academic integrity into practice

Duration: 30 minutes

Find out more

Reference list

A list of all citations and references used for this tutorial given in APA style.

Find out more

Further resources

A list of resources mentioned in the tutorial.

Find out more

Citing and referencing

See the Citing and referencing tutorial for more information on citing and referencing.

Find out more

https://www.monash.edu/learning-teaching/priorities-and-programs/assessment-and-academic-integrity/assessments-and-integrity-policy-and-procedure

Academic Integrity Moodle Unit

- https://www.monash.edu/students/study-support/academic-integrity

- Self-enrol, read the material

- Take the quizzes

How to succeed in FIT9137

- **Attendance:**
  come to the Workshops and Applied Sessions!

- **Participation:**
  actively take part

- **Preparation:**
  study through the material in advance

- **Questions:**
  ask me, your tutors, your fellow students!

- **Seek help:**
  Help Desks, counselling, medical services etc.

Seek Assistance

Student support services information can be found at:

https://www.monash.edu/students/support

University Support Services Flyer:

https://www.monash.edu/__data/assets/pdf_file/0005/1247108/university-support-services-Jan.2018.pdf

Medical condition:

https://www.monash.edu/disability/services-for-students