

# INFS 3008 FORMAL SOFTWARE ENGINEERING

**Credit Points** 10

**Legacy Code** 300404

**Coordinator** Yan Zhang ([https://directory.westernsydney.edu.au/search/name/Yan Zhang/](https://directory.westernsydney.edu.au/search/name/Yan%20Zhang/))

**Description** This subject is concerned with the design, development and maintenance of computer software systems. The subject focuses on current formal specification and system verification technologies and methodologies. Foundations of model checking such as LTL and CTL, as well as a particular practical model checker SPIN will be thoroughly studied in this subject. The SPIN model checker with programming language PROMELA will be used for all software development and verification practices throughout this subject.

**School** Computer, Data & Math Sciences

**Discipline** Information Systems

**Student Contribution Band** HECS Band 2 10cp

Check your HECS Band contribution amount via the Fees ([https://www.westernsydney.edu.au/currentstudents/current\\_students/fees/](https://www.westernsydney.edu.au/currentstudents/current_students/fees/)) page.

**Level** Undergraduate Level 3 subject

**Pre-requisite(s)** MATH 1006 AND COMP 2009

## Learning Outcomes

On successful completion of this subject, students should be able to:

1. Describe the general concepts and principles of formal methods for software development and verification.
2. Model concurrent systems using the concepts and formal notions of transition systems and program graphs.
3. Apply Linear Temporal Logic (LTL) and Computation Tree Logic (CTL) to specify the required properties.
4. Perform model checking using SPIN model checker.
5. Formulate PROMELA programs and using SPIN to specify and check the correctness of given software systems and programs.
6. Apply the advanced verification tools to undertake essential formal specification and verification tasks.

## Subject Content

Concept and Development of Formal Methods and System Verifications.

Modeling Concurrent Systems.

Linear Time Properties.

Linear Temporal Logic (LTL).

Computation Tree Logic (CTL).

SPIN Model Checker.

PROMELA Programming Language.

## Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/Group Task
Practical	To take place during practicals	60	N	Individual
Quiz	1.5 hours	20	Y	Individual
Quiz	1.5 hours	20	Y	Individual

Teaching Periods

### Spring (2022) Penrith (Kingswood)

**Day**

**Subject Contact** Yan Zhang ([https://directory.westernsydney.edu.au/search/name/Yan Zhang/](https://directory.westernsydney.edu.au/search/name/Yan%20Zhang/))

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=INFS3008\\_22-SPR\\_KW\\_D#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=INFS3008_22-SPR_KW_D#subjects))

### Parramatta - Victoria Rd

**Day**

**Subject Contact** Yan Zhang ([https://directory.westernsydney.edu.au/search/name/Yan Zhang/](https://directory.westernsydney.edu.au/search/name/Yan%20Zhang/))

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=INFS3008\\_22-SPR\\_PS\\_D#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=INFS3008_22-SPR_PS_D#subjects))

### Spring (2023) Penrith (Kingswood)

**On-site**

**Subject Contact** Yan Zhang ([https://directory.westernsydney.edu.au/search/name/Yan Zhang/](https://directory.westernsydney.edu.au/search/name/Yan%20Zhang/))

View timetable ([https://classregistration.westernsydney.edu.au/odd/timetable/?subject\\_code=INFS3008\\_23-SPR\\_KW\\_1#subjects](https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=INFS3008_23-SPR_KW_1#subjects))

### Parramatta - Victoria Rd

**On-site**

**Subject Contact** Yan Zhang ([https://directory.westernsydney.edu.au/search/name/Yan Zhang/](https://directory.westernsydney.edu.au/search/name/Yan%20Zhang/))

View timetable ([https://classregistration.westernsydney.edu.au/odd/timetable/?subject\\_code=INFS3008\\_23-SPR\\_PS\\_1#subjects](https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=INFS3008_23-SPR_PS_1#subjects))