

# NWEN241 (2018) - Systems Programming

## Prescription

This course considers the issues raised when programming at a low-level, for example in embedded systems, OS system level, or network protocol stacks. Topics include: an introduction to C language programming; and higher-level systems programming using Python scripting language. It will include motivating examples related to a wide variety of applications of system programming.

## Course learning objectives

Students who pass this course should be able to:

1. Use appropriate tools compiling/debugging C programs.
2. Write C programs using pointers and arrays, user-defined data types, input/output operations, bit-level operations, and user-defined and library routines.
3. Use or understand the main techniques of dynamic memory management in C.
4. Structure larger programs in multiple files.
5. Write simple Python programs.
6. Understand the differences between scripting and procedural programming languages.

## Withdrawal from Course

Withdrawal dates and process:

<https://www.victoria.ac.nz/students/study/course-additions-withdrawals>

## Lecturers

**Alvin Valera** (Coordinator)

[alvin.valera@vuw.ac.nz](mailto:alvin.valera@vuw.ac.nz)

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## Teaching Format

During the trimester there will be two lectures and one tutorial per week. There are practical lab (programming) assignments that require students to apply the concepts taught during the lectures.

## Student feedback

A summary of the course feedback provided by students previously for this course is available at [http://www.cad.vuw.ac.nz/feedback/feedback\\_display.php](http://www.cad.vuw.ac.nz/feedback/feedback_display.php).

## Dates (trimester, teaching & break dates)

- Teaching: 05 March 2018 - 08 June 2018
- Break: 23 April 2018 - 27 April 2018
- Study period: 11 June 2018 - 14 June 2018
- Exam period: 15 June 2018 - 04 July 2018

# Class Times and Room Numbers

## 05 March 2018 - 25 March 2018

- **Thursday** 13:10 - 14:00 – LT205, Hugh Mackenzie, Kelburn
- **Friday** 13:10 - 14:00 – LT101, Maclaurin, Kelburn

## 05 March 2018 - 01 April 2018

- **Monday** 13:10 - 14:00 – LT101, Maclaurin, Kelburn

## 02 April 2018 - 22 April 2018

- **Thursday** 13:10 - 14:00 – LT205, Hugh Mackenzie, Kelburn
- **Friday** 13:10 - 14:00 – LT101, Maclaurin, Kelburn

## 09 April 2018 - 22 April 2018

- **Monday** 13:10 - 14:00 – LT101, Maclaurin, Kelburn

## 30 April 2018 - 10 June 2018

- **Monday** 13:10 - 14:00 – LT101, Maclaurin, Kelburn
- **Thursday** 13:10 - 14:00 – LT205, Hugh Mackenzie, Kelburn
- **Friday** 13:10 - 14:00 – LT101, Maclaurin, Kelburn

# Other Classes

CO246 is reserved for use by NWEN 241 students to work on their practical assignments on the following days/time:

Mondays: 14:00-16:00  
Wednesdays: 09:00-11:00  
Thursdays: 14:00-16:00  
Fridays: 14:00-16:00

During these times, there will be tutor(s) present to assist students who have questions and need help.

# Set Texts and Recommended Readings

## Required

There are no required texts for this offering.

## Recommended

There are many good C and Python programming books available. Many people consider the book by Brian W. Kernighan and Dennis M. Ritchie, *The C Programming Language* [2nd Edition], Prentice Hall, 1988., to be the C programming bible.

We shall be referring to the following textbooks:

### C Programming:

- Al Kelley and Ira Pohl, *A Book on C* [4th Edition], Addison-Wesley, 1998.

### Python Programming:

- Allen B. Downey, *Think Python, How to Think Like a Computer Scientist* [2nd Edition] , How to Think Like a Computer Scientist by Allen B. Downey(Free online copy: <http://greenteapress.com/wp/think-python-2e/>)

The C book can be bought at VUW book center. The other book is available FREE online.

Other recommended C books:

- Stephen G. Kochan, *Programming in C: A complete introduction to the C programming language* [3rd Edition], Sams Publishing, 2005
- K. N. King, *C Programming: A Modern Approach* [2nd Edition], W. W. Norton & Company, 2008.
- Stephen Prata, *C Primer Plus* [5th Edition], Sams Publishing, 2005.
- Paul Deitel and Harvey Deitel, *C How to Program* [6th Edition], Pearson Education, 2010.
- Adam Hoover, *System Programming* [1st Edition], Pearson Education, 2010
- Learning with Python: Interactive Edition (Using Python 3.x) by Brad Miller and David Ranum, Luther

## Mandatory Course Requirements

In addition to achieving an overall pass mark of at least 50%, students must:

- Obtain at least 40% in at least 4 of the programming assignments.
- Obtain a **D** grade or better in the final exam.

*If you believe that exceptional circumstances may prevent you from meeting the mandatory course requirements, contact the Course Coordinator for advice as soon as possible.*

## Assessment

This course will be assessed through practical lab (programming) assignments, mid-term test, and a final examination.

Practical Lab (Programming) Assignments - 5 in total	As stated in the respective assignment handouts.	CLO: 1,2,3,4,5,6	30%
Mid-Term Test (45 minutes)	Week 6	CLO: 1,2,3	15%
Examination (2 hours)	Refer to university examination schedule.	CLO: 2,3,4,5,6	55%

## Penalties

1. Each practical lab assignment that is late (*i.e.*, submitted on the submission system after the deadline) will be penalised by 20% of the achieved marks if it is up to 24 hours late, and penalised by 40% if it is between 24 hours and 48 hours late. Any work submitted more than 48 hours after the deadline will receive 0 marks.
2. Each student will have 3 "late days" which you may choose to use for any lab assignment(s) during the course. There will be no penalty applied for these late days. You do not need to apply for these - any late days you have left will be automatically applied to lab assignments that you submit late.
3. The late days are intended to cover minor illnesses or other personal reasons for being late. You should only ask for extensions in the case of more significant or longer lasting problems (and you may need documentation). Do not waste "late days" on procrastination.

## Extensions

Requests for extensions must be sent in writing (email) to the course coordinator and lecturer, attaching any relevant supporting documents, e.g. medical certificate from doctor.

## Submission & Return

1. The practical lab (programming) assignments are MANDATORY.
2. Instructions on submission of practical lab assignments and return of work are available on the course Wiki at [https://ecs.victoria.ac.nz/Courses/NWEN241\\_2018T1/](https://ecs.victoria.ac.nz/Courses/NWEN241_2018T1/).

## Marking Criteria

As stated in the respective assignment handouts.

## Group Work

There is no group work.

## Peer Assessment

There will be no peer assessment.

Refer to [https://ecs.victoria.ac.nz/Courses/NWEN241\\_2018T1/](https://ecs.victoria.ac.nz/Courses/NWEN241_2018T1/) for details.

## Workload

The total workload for NWEN 241 is 150 hours. In order to maintain satisfactory progress in NWEN 241, you should plan to spend an average of 10 hours per week on this course.

## Teaching Plan

See [https://ecs.victoria.ac.nz/Courses/NWEN241\\_2018T1/LectureSchedule](https://ecs.victoria.ac.nz/Courses/NWEN241_2018T1/LectureSchedule)

## Communication of Additional Information

You must regularly check the course Wiki page at [https://ecs.victoria.ac.nz/Courses/NWEN241\\_2018T1/](https://ecs.victoria.ac.nz/Courses/NWEN241_2018T1/) for the latest information on the course, e.g. lecture schedule, assignments, reading materials, etc.

## Links to General Course Information

- Academic Integrity and Plagiarism: <https://www.victoria.ac.nz/students/study/exams/integrity-plagiarism>
- Academic Progress: <https://www.victoria.ac.nz/students/study/progress/academic-progress> (including restrictions and non-engagement)
- Dates and deadlines: <https://www.victoria.ac.nz/students/study/dates>
- Grades: <https://www.victoria.ac.nz/students/study/progress/grades>
- Special passes: Refer to the Assessment Handbook, at <https://www.victoria.ac.nz/documents/policy/staff-policy/assessment-handbook.pdf>
- Statutes and policies, e.g. Student Conduct Statute: <https://www.victoria.ac.nz/about/governance/strategy>
- Student support: <https://www.victoria.ac.nz/students/support>
- Students with disabilities: [https://www.victoria.ac.nz/st\\_services/disability/](https://www.victoria.ac.nz/st_services/disability/)
- Student Charter: <https://www.victoria.ac.nz/learning-teaching/learning-partnerships/student-charter>
- Terms and Conditions: <https://www.victoria.ac.nz/study/apply-enrol/terms-conditions/student-contract>
- Turnitin: <http://www.cad.vuw.ac.nz/wiki/index.php/Turnitin>
- University structure: <https://www.victoria.ac.nz/about/governance/structure>
- VUWSA: <http://www.vuwsa.org.nz>

**Offering CRN:** [18315](#)

**Points:** 15

**Prerequisites:** COMP 103

**Duration:** 05 March 2018 - 04 July 2018

**Starts:** Trimester 1

**Campus:** Kelburn