

# Course intro, Introduction to OS and programming in C/C++ in Linux

Søren Hansen <sha@ase.au.dk>  
V0.9

## Introduction

This first double lecture introduces the course and gets you started on the first 2 topics namely OSs and makefiles.

## Contents

Theme(s)	Topic(s)	Reference
Course	Overview Material Expectations	[1, 5]
Studying	Reading and understanding large texts	[7]
OS	What is an OS Kernel (and types) Processes Memory I/O Real-Time OS	[6, chap. 1-4.4] [2]
Programming in Linux	From source to executable	[8, 3, 4] [11, chap. 3-3.4]
	Makefiles	[8, 4] [9, chap. 5-5.4]
	Quick reference for makefiles	[0]
	Shell scripting	[10]

## Material

### Slides

- [1] S. Hansen, *Introduction to i4isu*, Slides - see course repos (I4ISU.pdf).
- [2] —, *Intro to oss*, Slides - see course repos.
- [3] —, *C++ programming in linux - target*, Slides - see course repos.
- [4] —, *C++ programming in linux*, Slides - see course repos.

### Local repository

- [5] S. Hansen, *Guide to the use of a wiki in i4isu*, Guide, See repo.
- [6] R. B. Muhammed, *Introduction to operating systems*, TFJ composed a pdf based on the text from: <http://www.personal.kent.edu/%7ermuhamma/OpSystems/os.html>.

### Online

- [7] Studiemetro. (2013). Aktiv akademisk læsning. Danish, [Online]. Available: <https://www.youtube.com/watch?v=WTu2-HSw50w>.

# Course intro, Introduction to OS and programming in C/C++ in Linux

Søren Hansen <sha@ase.au.dk>  
V0.9

- [8] Maemo.org. (2014). Gnu make and makefiles, [Online]. Available: [http://wiki.maemo.org/Documentation/Maemo\\_5\\_Developer\\_Guide/GNU\\_Build\\_System](http://wiki.maemo.org/Documentation/Maemo_5_Developer_Guide/GNU_Build_System).
- [9] P. D. S. Richard M. Stallman Roland McGrath. (2014). Gnu make, [Online]. Available: <https://www.gnu.org/software/make/manual/make.pdf>.
- [10] A. J. Mills. (). Unix shell scripting tutorial, [Online]. Available: <https://supportweb.cs.bham.ac.uk/documentation/tutorials/docsystem/build/tutorials/unixscripting/unixscripting.pdf>.

## Hardback

- [11] M. Kerrisk, *The linux programming interface*. No Starch Press, Inc, 2010, ISBN: 978-1-59327-220-3.

[0] - E.g. The quick reference material is mostly for getting an overview and in helping completing the assignment.

## Fundamental questions to consider while reading

### Course specifics

- What is required in terms of exercises - labs and reviews
- When writing a review, which elements have to be present and to what extend
- Where do I get a DevKit8000 and where do I get information about it
- Where do I find the material for this course
- How do I study efficiently (not covered in the lecture per se - but considered a must!)

### What an OS is - questions

- Grasp the different major concepts that make up an OS
- Which different OS categories do you believe exists
- What is a process and from where does it come from
- What is *protection* or *sandbox* in relation to a process
- What happens in Userspace and/or in Kernelspace
- Can a process have multiple threads?

### Programming in Linux

- Which two processes are involved in generating an executable based on some sources. E.g. what do each of them do?
- What is the purpose of using makefiles
- Describe the 3 main terms
  - target (or goal)<sup>1</sup>

---

<sup>1</sup>If in doubt - read the literature or take a look at the slides.

# Course intro, Introduction to OS and programming in C/C++ in Linux

Søren Hansen <sha@ase.au.dk>  
V0.9

---

- pre-requisites/dependencies
  - recipe
- Variables
  - What are used for in this context
  - How do you denote a variable
- Why do you need *.PHONY* on occasion?
- If I want to add the contents of one `makefile` into another, how is that accomplished?