# PHYS 1121 and 1131.

**Don't leave spaces in rows of seats.** (Theatre may be full). Class numbers likely to equilibrate over a week or two.

**Meanwhile**, introduce yourself to your neighbours.

**Labs and Homework classes** start in week 2.

**Text.** Serway and Jewett: Physics for Scientists and Engineers. You need to *have access to* a textbook (own, library, share)

**http://www.phys.unsw.edu.au/firstyear/syllabi/phys1131.html**

or search PHYS1121 or PHYS1131

Lecturers: Elizabeth Angstmann and Joe Wolfe

**Assumed mathematical knowledge:**

Plotting and reading graphs

Appropriate use of significant figures

Solving quadratic equations

Exponential and log

Solving simultaneous equations

Trigonometric functions and some identities

Differentiation and integration

Solving simple differential equations

The following sections will be very rapid

Introduction to vector addition and subtraction

Vector components and resolving vectors

**Assumed physics knowledge:**

Officially none. However, we'll go ***quickly*** through parts of mechanics (eg projectiles).

**Assumed history/geography knowledge:**

**MB** is for Movern-Brown building (History Dept)

**OMB** is for Old Main Building (Physics)

**Assessment**:

The course web site has the official document

Labs + quizzes + exam

**Labs.** Run and marked independently from lecture syllabus.

How to do well in the exam?

**Learning resources for 1131/1121**

| | In your timetable? | | Where? |
|---|---|---|---|
| • lectures | yes | | here |
| • lab exercises | yes | | lab |
| • lab preparation | *not yet* | | you choose |
| • homework questions | *not yet* | | you choose |
| homework classes | yes | | usually in this building |
| • teaching assistants | *not yet* | | OMB 01 |
| • on-line tutorials | *not yet* | | on-line |
| • quizzes | odd weeks | on-line | you choose |
| • physclips | *not yet* | | on-line (search) |
| • lecture notes | | | download from the course website |
| • lecture recordings (if needed) | | | download from UNSW Lectopia |
| • Serway and Jewett | *not yet* | | you choose |
| • S & J summary slides | | | download |

**Outline of physics in first year**

| **PHYS 1121-1131** | **PHYS 1221-1231** |
|---|---|
| (session 1) | (session 2) |
| Mechanics | Electricity and magnetism |
| Thermal | Physical optics |
| Waves & sound | Intro to quantum and solid state |

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**PHYS 1121-1131 Mechanics** (weeks 1-6)

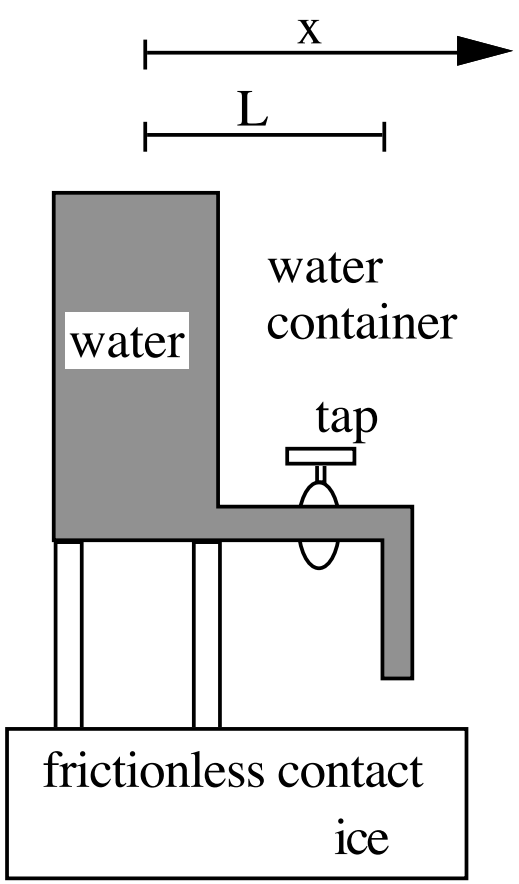
| | | |
|---|---|---|
| Kinematics | describing motion | (vectors) |
| Dynamics: | forces | Newton's explanation of motion |
| | work and energy | ~ Hamilton's explanation |

Gravity & planetary mechanics

Momentum and collisions

Rotation

**Two problems for anyone who is bored.**




Tank (mass M) contains water (mass m). L is distance from centre of mass of container to pipe. Pipe is small compared to tank.

Open the tap, water flows out.

After, where is the tank and which way is it moving?

Explain your answer in terms of forces on the tank.

$$\underline{\mathbf{F}} = m\underline{\mathbf{a}}$$

i) Is this a law of physics? ii) Is it a definition of force? (If not, what is?)

iii) Is it a definition of mass? (If not, what is?) Can it be more than one of these?

**Learning outcomes**

By the end of this course, you will understand the important principles of classical mechanics, thermal physics and waves, and you will be able

- to interpret problems in classical mechanics, thermal physics and waves
- to analyse and to quantify them, invoking **appropriate principles** and making **appropriate approximations**
- to solve such problems and to interpret the solutions

*Lecture and homework components*

- to plan an experimental investigation
- to make careful measurements
- to analyse experimental results, to test hypotheses and to discuss their implications

*lab component*

**What sort of things will we be able to do?**

**Why?**