Welcome to Phys 122
Who am I, where to find me, etc...

<table>
<thead>
<tr>
<th>Name:</th>
<th>Dr. Guenter Scholz</th>
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<tbody>
<tr>
<td>Office:</td>
<td>PHY 358</td>
</tr>
<tr>
<td>Lab:</td>
<td>PHY 115</td>
</tr>
<tr>
<td>Phone:</td>
<td>x 32213 (office)</td>
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<tr>
<td>E-mail:</td>
<td><a href="mailto:scholz@uwaterloo.ca">scholz@uwaterloo.ca</a></td>
</tr>
<tr>
<td>Office hours:</td>
<td>M, W, F: 10:30 - Noon</td>
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<td></td>
<td>if I'm in my office, Anytime!</td>
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What do I do at U.W. other than teach?
I operate a Transmission Electron Microscopy (TEM) and image materials down to the nano-scale (10’s of Å)
Basic information about PHY 122

Textbook: ‘Essential University Physics’ by Wolfson 1st ed

Exams: 1 Midterm test and 1 Final exam

Assignments: 1 / week; about 10 in total

Grading: 15% or 0% - Assignments
25% or 0% - Midterm Test
60%, 85% or 100% - Final Exam

On-line info on ACE: https://uwangel.uwaterloo.ca
PHY 122 Course outline

- Ch. 12 Elastic Properties of Solids (§12.4 only)
- Ch. 14 Fluid Mechanics (omit §14.7)
- Ch. 15 Oscillatory Motion (omit §15.6, 7)
- Ch. 16 Wave Motion (omit §16.6)
- Ch. 17 Sound Waves (omit §17.3, 5, 6)
- Ch. 18 Superposition and Standing Waves (omit §18.6-8)
- Ch. 37 Interference of Light Waves
- Ch. 40 Introduction to Quantum Mechanics (omit §40.3)
- Ch. 41 Quantum Mechanics (omit §41.7)
- Ch. 42 Atomic Physics “maybe” (omit §42.8, 9, 10)
- Ch. 43 Molecules and Solids “maybe” (omit §43.7, 8)
Assignments, Tutorials and Exams info

Weekly Assignments       Marker :   TBA

Midterm Test and Final Exam
• will include both problems and conceptual questions
• date, time and place will be announced in class and on UWACE
• practice tests with solutions will be available on UWACE
  about 2 weeks prior to the Midterm Test and Final Exams

Tutorials      TA :   TBA
• will be held in Phys 235  -- M, T, W (15:30-16:20), Thu (14:30-15:20)  --
  if you can’t make your assigned tutorial, do go to the others
• attendance is voluntary, but “ highly ” recommended !
Basic math you absolutely need to know

• Vectors
  • Scalars and vectors, vector components, unit vectors
  • Addition of vectors
  • Product of 2 vectors (dot and vector products)

• Trigonometry
  • sin, cos, tan and associated trigonometry laws

• A little bit of Calculus
  • finite / infinite sums, first and second order derivatives, integrals

note: use your math books or the web to review the information listed above. You could also prepare a Math formula sheet or buy one from the UW bookstore for quick reference.
How to succeed in this class?

You do not really understand something unless you can explain it to your grandmother.  

Albert Einstein

• Attend the lectures

• Read the textbook

• Work through the assignments *yourself*

• Do not hesitate to ask for help – discuss problems with your peers, the help desk TA’s or, of course, me!

• Do the practice tests *yourself*
Problem solving strategy

• Read the question
  (Make sure you understand the question and identify what information relevant to the problem is available or not available)

• Draw a diagram
  (Free body diagram = all the forces on each object in the problem)

• Define a coordinate system
  (Define positive and negative directions)

• Form a conceptual solution
  (Spend enough time to choose and visualize a way of solving the problem)

• Apply physics laws
  (Write down only the mathematical formulas describing the physics laws relevant to the problem to be solved)

• Derive a complete solution
  (Math skills required – some algebra, trigonometry and maybe calculus)