

# PHYS 1P94 - Introductory Physics III

## Instructor:

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## Brock Calendar Entry

Rotational and center-of-mass motion; work done by a variable force; electric and magnetic fields; electric potential and potential energy; magnetic induction; AC circuits and resonance; wave-particle duality; elements of modern physics. Use of computers for data acquisition; elements of computer programming; principles of scientific writing and communication

*Prerequisites:* PHYS 1P21 and one of MATH 1P05, 1P01 or 1P97

Meeting Times: Monday, Wednesday, Friday 12:00-13:00; Friday 11:00-12:00 (office hour)

Textbook: The textbook is published by OpenStax (Rice University). It consists of three on-line volumes *University Physics, Vol. 1,2,3* by Moebs, Ling and Sanny:

<https://openstax.org/details/university-physics-volume-1>

<https://openstax.org/details/university-physics-volume-2>

<https://openstax.org/details/university-physics-volume-3>

and is available to download for free at

<http://cnx.org>

Required Software: Download the IClicker app onto your computer or smartphone. The app (less than \$20 USD) is available at:

<https://www.iclicker.com/students/>

## Topics

1. Rotational Motion/ Mechanics - approximately 4 weeks
2. Electrostatics/ DC circuits - 3 weeks
3. Magnetism/ AC circuits - 3 weeks
4. Modern Physics - 2 weeks

### Course Policies

- All students are required to know and abide by the Academic Integrity Policy of Brock University. The University takes Academic Misconduct extremely seriously and will follow its strict procedures to the letter in all cases. Assignments will be checked for plagiarism using Turnitin software.

<https://brocku.ca/academic-integrity/>

- Late questions/ lab reports / assignments will NOT be accepted.
- Note that the last day to withdraw without academic penalty is Mar. 4, 2022.

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|------------------|------|---|
| Class Questions  | 5%   | (starting class #2)<br><b>Please send your question about video material /problems by 8 pm the night before lecture.</b><br>Each lecture will have one or two videos ( $\approx 20 - 30$ min total) that you are expected to watch before lecture and try some suggested problems before the lecture.<br>Lecture-time will be spent answering these questions and doing problems.   |
| iclicker Quizzes | 5%   | (starting class #2)<br>Create an iclicker account and then enroll in PHYS1P94.FW21.D3<br>Download iclicker app onto your smartphone or laptop.<br><b>iclicker Quizzes will take place during lecture</b> based on the videos/readings<br>Understand the definitions and physical meaning of important equations.  |
| Lab Work         | 27%  | <b>Lab 0:</b> Computer Assignment <b>L<sup>A</sup>T<sub>E</sub>X Documents</b> (2%)<br>due Sun Jan 16- 11pm<br><b>Lab 1:</b> Computer Assignment <b>Uncertainty</b> (2%):<br>due Sun Jan 23 - 11pm<br><b>Lab 2:</b> Lab Assignment: <b>Angular Motion</b> (3%):<br>due Sun Jan 30 - 11pm<br><b>Lab 3:</b> Computer Assignment: <b>Least Square Fitting</b> (2%):<br>due Sun Feb 6 - 11pm<br><b>Lab 4:</b> Lab Assignment: <b>Viscosity</b> (3%):<br>due Sun Feb 13 - 11 pm<br><b>Lab 5:</b> Computer Assignment: <b>numerical integration I</b> (2%):<br>due Sun Feb 20 - 11pm<br><b>Lab 6:</b> Lab Assignment: <b>Capacitors</b> (3%):<br>due Sun Mar 6 - 11 pm<br><b>Lab 7:</b> Computer Assignment: <b>numerical integration II</b> (2%):<br>due Sun Mar 13 - 11pm<br><b>Lab 8:</b> Lab Assignment : <b>e/m ratio</b> (3%):<br>due Sun Mar 20 - 11 pm<br><b>Lab 9:</b> Computer Assignment : <b>numerical integration III</b> (2%):<br>due Sun Mar 27 - 11pm<br><b>Lab 10:</b> Lab Assignment:: <b>Faraday Rotation</b> (3%):<br>due Sun Apr 3 - 11 pm |
| Tests            | 40%  | There will be five tests during the following lab periods<br>Test 1: Week of Jan. 17-21<br>Test 2: Week of Jan. 31- Feb. 4<br>Test 3: Week of Feb. 14-18<br>Test 4: Week of Mar. 7-11<br>Test 5: Week of Mar. 21-25<br><b>Multiple-choice questions and problem(s)</b>  |
| Final Exam       | 23 % | Written - Comprehensive   |