General Physics II

Class code
PHYS-UA 9012 – 008 (Lec)
PHYS-UA 9012 – 009 (Lab)
PHYS-UA 9012 – 010 (Rec)

Instructor Details
Dr Quentin Roper
quentin.roper@nyu.edu
Md. Rejvi Kaysir
mk5584@nyu.edu

Consultation by Appointment
Please allow at least 24 hours for your instructor to respond to your emails.

Class Details
Spring 2017

General Physics II

Tuesday 2:00 – 5:00pm (Lec)
January 31 to May 2
Auditorium
NYU Sydney Academic Centre

Tuesday 5:30 – 6:30pm (Rec)
January 31 to May 2
Auditorium
NYU Sydney Academic Centre

Wednesday 4:00 – 6:00pm (Lab)
February 1 to May 4
UTS Science Lab CB04.03.510 (Building 4, level 3, room 510).
Building 4, 745 Harris Street, Ultimo, NSW 2007

Prerequisites
General Physics I
This course is an introduction to electricity and magnetism, light, geometrical and wave optics. Many concepts from General Physics I will be used in this course such as: position, velocity, acceleration, force, Newton’s laws of motion, work and energy. The course uses high school algebra, geometry and trigonometry, vectors and vector arithmetic, and some calculus. Calculus will be used in class but sparingly on exams. The algebra, geometry, and trig are absolutely essential. If some time has elapsed since your last math course, or you feel a lack of confidence in this area, you are strongly urged to study math intensively before we get too deeply into the physics course. The course has lecture, online homework and laboratory portions.

By taking this course you will develop a basic understanding of electricity and magnetism, light, geometrical and wave optics. You will develop a conceptual understanding of the underlying physical principles and apply this to specific situations such as basic circuits and electrical devices, or the behaviour of light in terms of refraction, diffraction and interference. You will also be able to undertake calculations and analyse the mentioned topics quantitatively. The overall outcome is a basic understanding of electromagnetism in the many ways in which it manifests itself.

Exams
There will be four examinations, three during the semester and one cumulative final examination. The four exams will be based on the homework, textbook, and lectures. Examinations will be written with the assumption you have read the assigned sections of the book, completed the homework on MasteringPhysics and attended the lectures. Both quantitative and conceptual questions will appear on the examinations, as this reflects the content of the course.

A formula sheet will be provided with the exam, but you will be able to see the formula sheet online on NYU classes before the exam. You will need to bring a calculator to all exams. Sharing calculators with other students during examinations is not allowed. You may not use a cell-phone, or any other communication device, during the exams.

Laboratory Sessions
It is important to bring a calculator and your laboratory experiment description to the laboratory sessions.
The laboratory grade will be based on an average over all labs, but the lowest lab grade will be dropped before the average is calculated. Any lab missed without a doctor’s note or prior arrangement with the instructor counts as a zero. There are no make-up sessions for missed laboratories. Your laboratory instructor will provide more information regarding the policy for handing in lab reports.

If you miss more than two lab experiments or fail to hand in more than two reports, your grade for the course will be an F or an I (assuming that you are passing the other components of the course and that you provide medical documentation to explain your absence). To make up the lab requirement, you will have to complete the entire set of labs, not just the ones you missed. This can be done in the following summer session or in the next academic year, space permitting.

**MasteringPhysics Homework**

Doing the MasteringPhysics homework, the homework problems from book, and the questions posted the night before each lecture also constitute work designed to increase your understanding of fundamental concepts. Homework from the textbook will be assigned but it is not to be handed in for grading. The only homework that will be graded is that on MasteringPhysics.

There are different types of problems you will encounter in MasteringPhysics: not all are found in the textbook. Some questions will be conceptual, others quantitative, some will be multiple choice and some not; some will require a numerical answer while others will require a symbolic answer, one expressed using variables, including subscripts. You must first learn how to use the system properly.

To aid you in this, your first assignment is called “Introduction to MasteringPhysics.” While it will not contribute to your grade, it is strongly recommended that you complete this assignment. Doing so may prevent you from losing credit on homework assignments. This assignment will introduce you to the wide variety of questions you will encounter, such as “sorting questions,” “ranking questions,” and “graphing questions.” The system also provides hints for many individual problems. You should familiarize yourself with the grading policy as it pertains to homework, including hints.

*Failure to submit or fulfill any required course component will result in failure of the class.*

*For this course your total numerical score, calculated from the components listed above, is converted to a letter grade without rounding.*

**Assessment Expectations**

**Grade A:** Excellent work showing a thorough knowledge and understanding of the topics, with excellent use of scientific language, detailed analysis and clear logical explanations, showing insight, independent, original thought and reasoning.
Grade B: Good work with good general knowledge and understanding of the topics, accurate use of scientific language, good general analysis and coherent explanations showing some independent reasoning, reading and research.

Grade C: Satisfactory work, broadly correct both factually and analytically, with some explanation and reasoning: the work will typically demonstrate a basic understanding of the topic.

Grade D: Passable work, showing a general, superficial knowledge and understanding of the topic, lacking satisfactory use of scientific language or adequate analysis.

Grade F: Unsatisfactory work in all criteria. The minimum requirements for the course have not been met.

Grade Conversions
For this course your total numerical score, calculated from the components listed above, correspond to the following letter grades:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90 to 100</td>
</tr>
<tr>
<td>A-</td>
<td>86 to &lt;90</td>
</tr>
<tr>
<td>B+</td>
<td>82 to &lt;86</td>
</tr>
<tr>
<td>B</td>
<td>72 to &lt;82</td>
</tr>
<tr>
<td>B-</td>
<td>68 to &lt;72</td>
</tr>
<tr>
<td>C+</td>
<td>64 to &lt;68</td>
</tr>
<tr>
<td>C</td>
<td>54 to &lt;64</td>
</tr>
<tr>
<td>C-</td>
<td>50 to &lt;54</td>
</tr>
<tr>
<td>D+</td>
<td>45 to &lt;50</td>
</tr>
<tr>
<td>D</td>
<td>40 to &lt;45</td>
</tr>
<tr>
<td>F</td>
<td>0 to &lt;40</td>
</tr>
</tbody>
</table>

Submission of Work
Should work be submitted as a hard copy, or electronically?
Unless otherwise specified, all written work must be submitted as a hard copy. The majority of written assignments must also be submitted electronically via NYU Classes. All in-class presentations must be completed during class time.

Who may submit a student’s work?
Each student’s assigned work must be handed in personally by that student. The student may not nominate another person to act on his/her behalf.

When and where should the work be submitted?
The hard copy of any written work must be submitted to the instructor at the beginning of class on the date the work is due. If the assignment due date falls outside of class time, work must be submitted to the Staff Member on duty in Room 2.04 during prescribed Office Hours (11:30am-12:30pm and 2:30-3:30pm Mon-Thu), or by appointment with the Academic Programs Coordinator. Each submitted item of work received in Room 2.04 will be date and
time stamped in the presence of the student. Work submitted in Room 2.04 will not be considered “received” unless formally stamped.

What is the Process for Late Submission of Work?
After the due date, work may only be submitted under the following conditions:

- Late work, even if an extension has been granted, must be submitted in person by appointment with the Academic Programs Coordinator. Each submitted item of work must be date and time stamped in order to be considered “received”.

- Work submitted after the submission time without an agreed extension receives a penalty of 2 points on the 100-point scale (for the assignment) for each day the work is late. Written work submitted beyond five weekdays after the submission date without an agreed extension receives a mark of zero, and the student is not entitled to feedback for that piece of work.

- Because failure to submit or fulfil any required course component will result in failure of the course, it is crucial for students to submit every assignment even when it will receive a mark of zero. Early departure from the program therefore places the student at risk of failing the course.

Plagiarism Policy
The academic standards of New York University apply to all coursework at NYU Sydney. NYU Sydney policies are in accordance with New York University’s plagiarism policy. The presentation of another person’s words, ideas, judgment, images or data as though they were your own, whether intentionally or unintentionally, constitutes an act of plagiarism.

It is a serious academic offense to use the work of others (written, printed or in any other form) without acknowledgement. Cases of plagiarism are not dealt with by your instructor. They are referred to the Director, who will determine the appropriate penalty (up to and including failure in the course as a whole) taking into account the codes of conduct and academic standards for NYU’s various schools and colleges.

Attendance Policy
Study abroad at Global Academic Centres is an academically intensive and immersive experience, in which students from a wide range of backgrounds exchange ideas in discussion-based seminars. Learning in such an environment depends on the active participation of all students. And since classes typically meet once or twice a week, even a single absence can cause a student to miss a significant portion of a course. To ensure the integrity of this academic experience, class attendance at the centres is mandatory, and unexcused absences will affect students' semester grades. The class roster will be marked at the beginning of class and anyone who arrives after this time will be considered absent. Students are responsible for making up any work missed due to absence.

For courses that meet once a week, one unexcused absence will be penalised by a two percent deduction from the student’s final course grade. For courses that meet two or more
times a week, the same penalty will apply to two unexcused absences. Repeated absences in a course may result in failure.

Faculty cannot excuse an absence. Requests for absences to be excused must be directed to the Academic Programs Coordinator. Students must provide appropriate documentation for their absence. In the case of illness, students must contact the Academic Programs Coordinator on the day of absence. They must provide medical documentation to Academic Programs Coordinator within three days of the absence in order to be medically excused. The note must include a medical judgement indicating that the student was unfit to attend class/work on the specific day or dates of the absence. Faculty will be informed of excused absences by the Academic Programs staff.

### Classroom Expectations

This is a seminar subject and requires the active participation of all students. It also requires engaged discussion, including listening to and respecting other points of view. Your behaviour in class should respect your classmates’ desire to learn. It is important for you to focus your full attention on the class, for the entire class period.

- Arrive to class on time.
- Once you are in class, you are expected to stay until class ends. Leaving to make or take phone calls, to meet with classmates, or to go to an interview, is not acceptable behaviour.
- Phones, digital music players, and any other communications or sound devices are not to be used during class. That means no phone calls, no texting, no social media, no email, and no internet browsing at any time during class.
- Laptop computers and tablets are not to be used during class except in rare instances for specific class-related activity expressly approved by your instructor.
- The only material you should be reading in class is material assigned for that class. Reading anything else, such as newspapers or magazines, or doing work from another class, is not acceptable.
- Class may not be recorded in any fashion – audio, video, or otherwise – without permission in writing from the instructor.

### Diversity, Inclusion and Equity

NYU is committed to building a culture that respects and embraces diversity, inclusion, and equity, believing that these values – in all their facets – are, as President Andrew Hamilton has said, “...not only important to cherish for their own sake, but because they are also vital for advancing knowledge, sparking innovation, and creating sustainable communities.” At NYU Sydney we are committed to creating a learning environment that:

- fosters intellectual inquiry, research, and artistic practices that respectfully and rigorously take account of a wide range of opinions, perspectives, and experiences; and
- promotes an inclusive community in which diversity is valued and every member feels they have a rightful place, is welcome and respected, and is supported in their endeavours.
Religious Observance

Students observing a religious holiday during regularly scheduled class time are entitled to miss class without any penalty to their grade. This is for the holiday only and does not include the days of travel that may come before and/or after the holiday. Students must notify their professor and the Academic Programs Coordinator in writing via email one week in advance before being absent for this purpose.

Provisions to students with Disabilities

Students with disabilities who believe that they may need accommodations in a class are encouraged to contact the Moses Centre for Students with Disabilities at (212) 998-4980 as soon as possible to better ensure that such accommodations are implemented in a timely fashion. For more information, see Study Away and Disability.

Required Texts

It is a course expectation that you have done the required reading and have prepared sufficiently to discuss them in class.

Laboratory Experiment Descriptions can be found by going to: [http://physics.nyu.edu/~physlab/GenPhysII_PhysIII/genphys2.html](http://physics.nyu.edu/~physlab/GenPhysII_PhysIII/genphys2.html)

An access code for MasteringPhysics - an online homework and tutorial system with either etext and/or print copy of University Physics, 13th edition, by Young and Freedman.

The access code for MasteringPhysics includes an etext version of University Physics, 13th edition, by Hugh Young and Roger Freedman. If you prefer a print copy, the NYU bookstore does carry the "binder-ready" version (which also includes an access code for MasteringPhysics.)

You will access the systems via [www.masteringphysics.com](http://www.masteringphysics.com). The MasteringPhysics course ID for the Spring 2017 semester of General Physics II is MPROSS13366. You will not be able to access homework without this course ID.

Important: When you register for MasteringPhysics:

- enter your NYU ID (the “N” number) when you are prompted to enter a Student ID and
- enter your NYU email address.

Failure to do these two steps will result in your homework not counting towards your grade.

Please note that if you already have a copy of the 13th edition of University Physics, or you purchase a copy from a third party source, that does not mean you have the access code. You can purchase the access code by going to www.masteringphysics.com.
A list of the top questions from students can be found by going to the following web page: http://www.pearsonmylabandmastering.com/northamerica/masteringphysics/students/support/top-questions/index.html

In particular, you should view the following two videos on registration and grading.
http://www.masteringsupport.com/videos/registration_tips/registration_tips.html
http://www.masteringsupport.com/videos/understand_grading/understand_grading.html

You must check that your computer is set up properly to use MasteringPhysics. You will find the following web page useful in assisting you with this task:
http://www.pearsonmylabandmastering.com/northamerica/masteringphysics/students/support/system-requirements/index.html

Optional Texts

- *Mathematics for Physics with Calculus*, Biman Das, ISBN-10: 0131913360, ISBN-13: 9780131913363. You are required to know algebra, geometry, vectors, trigonometry, and differentiation. This is a good resource if you would like a reference to provide assistance with the mathematics in the course. Not all of the material in this book is relevant for General Physics, but you will find chapters on algebra, vectors, trigonometry, differentiation and data analysis and statistics. The latter chapter might help you when writing your lab reports.

<table>
<thead>
<tr>
<th>Week (Lec/Rec/Lab)</th>
<th>Lecture/Exams</th>
<th>Readings (Chap)</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Electric Charge and Electric Field</td>
<td>21</td>
<td>No Lab</td>
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<tr>
<td>Tue 31 Jan</td>
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<tr>
<td>No Recitation</td>
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<tr>
<td>Week 2</td>
<td>Electric Potential</td>
<td>23</td>
<td>Check-in and Safety Orientation</td>
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<td>Tue 7 Feb</td>
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<tr>
<td>Week 3</td>
<td>Capacitance and Dielectrics</td>
<td>24</td>
<td>E Field Mapping</td>
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<td>Tue 14 Feb</td>
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<tr>
<td>Week 4</td>
<td>Current, Resistance, and Electromotive Force</td>
<td>25</td>
<td>Oscilloscope</td>
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<tr>
<td>Tue 21 Feb</td>
<td>Exam 1 (15%) (Lecture 4)</td>
<td></td>
<td></td>
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<tr>
<td>Week 5</td>
<td>Direct-Current Circuits</td>
<td>26</td>
<td>Voltage, Current and Resistance I</td>
</tr>
<tr>
<td>Tue 28 Feb</td>
<td></td>
<td></td>
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<tr>
<td>Week 6</td>
<td>Direct-Current Circuits Magnetic Field and Magnetic Forces</td>
<td>26, 27</td>
<td>Voltage, Current and Resistance II</td>
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<tr>
<td>Tue 7 Mar</td>
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<tr>
<td><strong>Mid Semester Spring Break: 13 - 17 March (Week 7)</strong></td>
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<tr>
<td>Week 8</td>
<td>Magnetic Field and Magnetic Forces Sources of Magnetic Field</td>
<td>27, 28</td>
<td>RC Circuit</td>
</tr>
<tr>
<td>Tue 21 Mar</td>
<td></td>
<td></td>
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<tr>
<td>Week 9</td>
<td>Sources of Magnetic Field Exam 2 (15%) (Lecture 8)</td>
<td>28</td>
<td>Current Balance</td>
</tr>
<tr>
<td>Tue 28 Mar</td>
<td></td>
<td></td>
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<tr>
<td>Week 10</td>
<td>Electromagnetic Induction</td>
<td>29, 30</td>
<td>EM Induction</td>
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<tr>
<td>Tue 4 Apr</td>
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<tr>
<td>Week 11</td>
<td>Electromagnetic Waves The Nature and Propagation of Light</td>
<td>32, 33</td>
<td>RL Circuit</td>
</tr>
<tr>
<td>Tue 11 Apr</td>
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<tr>
<td>Week 12</td>
<td>The Nature and Propagation of Light Geometric Optics</td>
<td>33, 34</td>
<td>No Lab</td>
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<tr>
<td>Tue 18 Apr</td>
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</tbody>
</table>
### Week (Lec/Lab/Rec)

**Week 13**  
Friday 28 April  
(Make-up class for ANZAC Day)

**Lecture Topic**  
FRIDAY – (Make-up class for ANZAC Day)  
Geometric Optics  
**Exam 3 (15%) (Lecture 12)**

**Readings (Chap)**  
34

**Laboratory**  
The Human Eye

**Week 14**  
Tue 2 May

**Lecture Topic**  
Interference & Diffraction

**Readings (Chap)**  
35, 36

**Laboratory**  
Interference

**Week 15**  
Tue 9 May

**Lecture Topic**  
Revision

**Laboratory**  
No Lab

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**Final Exam (25%) Exam Week: Wednesday 17 May, 3:00 – 5:00pm**

**Your Instructor**

Dr. Quentin Roper (Ph. D., University of Iowa) is an astronomer who specializes in high energy astrophysics. His research interests include X-ray binaries, astrostatistics, supernovae and supernova remnants. He has incorporated non-gaussian likelihood analysis to improve the usability of low surface brightness, low resolution imaging spectroscopy, particularly to analyse the composition of supernova remnants. He most recently has been using archival data taken from the Chandra X-ray Telescope to constrain the kinematics of young supernova remnants and derive properties of the remnant's progenitor system.