Alexander College
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CURRICULUM GUIDE: OFFICIAL COURSE OUTLINE

<table>
<tr><td>Course Code</td><td>PHYS 102</td><td>Course Title</td><td colspan="4">Physics for the Life Sciences II</td></tr>
<tr><td>Credit Value</td><td>4</td><td>Department</td><td colspan="4">Mathematics and Science</td></tr>
<tr><td rowspan="2">No. of weeks</td><td rowspan="2">14</td><td rowspan="2">Hrs. per week</td><td>Lecture</td><td>Tutorial</td><td>Laboratory</td><td>Total</td></tr>
<tr><td>3</td><td>0</td><td>3</td><td>6</td></tr>
<tr><td>Course Description</td><td colspan="6">Second part of a two-semester general-physics survey course intended principally for life-science majors. Topics covered include electromagnetism, ray optics, and nuclear physics with applications to the life sciences.</td></tr>
<tr><td>Prerequisite(s)</td><td colspan="6">ENGL 099, PHYS 101, MATH 105 or MATH 152 (Math may be taken concurrently)</td></tr>
<tr><td rowspan="2">Initial Articulation Targets</td><td>UBC</td><td>SFU</td><td>UVic</td><td>UNBC</td><td colspan="2">TRU</td></tr>
<tr><td>PHYS 1st (3), Exempt UBCV PHYS 101 (3)</td><td>PHYS 102 (3), Q/B-Sci & PHYS 133 (1) Q</td><td>ALEX PHYS 101 (4) & ALEX PHYS 102 (4) = UVIC PH&YS 102A (1.5) & UVIC PHYS 102B (1.5)</td><td>PHYS 101 (4)</td><td colspan="2">PHYS 1200 (3)</td></tr>
<tr><td colspan="6">For updated information on the transferability of this course, please consult the BC Transfer Guide, www.bctransferguide.ca</td></tr>
<tr><td>Learning Outcomes</td><td colspan="6">Upon successful completion of this course, the student will be able to:
Draw free-body diagrams to determine the forces on an object. Forces include gravity, electric force, and magnetic force.
Determine the electric and magnetic forces and fields from charge distributions that are fixed and moving using Maxwell’s Equations: Gauss’ Law, Faraday’s law, and Ampere-Maxwell’s Law.
Solve circuits involving resistors, capacitors, and inductors using Kirchhoff’s loop and junction rules.
Relate Maxwell’s equations to electromagnetic radiation.
Explain the ray optics of light and use the law of reflection and Snell’s laws to predict the path of light rays. Determine the location of images from lenses.
Explain the structure and properties of the nucleus
Explain alpha, beta, and gamma decays and determine the number of nuclei given the half-life.
Set-up, record, and analyze data from experiments using uncertainty analysis and compare the results to theory.</td></tr>
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<table>
<tr><td>Content</td><td colspan="3">Core topics – all of the following will be covered:
Electrostatics: Coulomb’s Law, Gauss’ Law, Electric Potential
Magnetism: Ampere’s Law
Electromagnetic Induction: Faraday’s Law
Circuits: Resistors, Capacitors, Inductors
Electromagnetic Radiation
Ray Optics, Law of Reflection, Snell’s Law, Lenses
Nuclear physics
Radioactivity: Decay, Half-life
Labs cover the topics in this course

Additional topics may also be covered, at the discretion of the instructor.</td></tr>
<tr><td>Methods of Instruction</td><td colspan="3">Lectures, problem sessions, assignments, laboratory work, presentations, assigned reading, quizzes, exams</td></tr>
<tr><td>Required Textbook(s)</td><td colspan="3">The following textbook(s) is/are required, or approved equivalent(s).

Giancoli, Douglas C. Physics: Principles with Applications. 7th Ed. With Mastering PhysicsTM Toronto: Pearson, 2013.</td></tr>
<tr><td>Required Equipment and Technology</td><td colspan="3">Students are required to have a computer with internet access.
The following resources are provided by the College:
Office 365
Student email</td></tr>
<tr><td>Homework Hours</td><td colspan="3">At minimum, students can expect one hour of homework for every hour of instructional time.</td></tr>
<tr><td rowspan="5">Evaluation</td><td>Component</td><td colspan="2">% Value</td></tr>
<tr><td>Quizzes and assignments</td><td colspan="2">10-25%</td></tr>
<tr><td>Laboratory experiments and activities
• Weight divided over 10 labs</td><td colspan="2">10-20%</td></tr>
<tr><td>Midterm exam (1-2)</td><td colspan="2">20-40%</td></tr>
<tr><td>Comprehensive final exam</td><td colspan="2">30-35%</td></tr>
<tr><td>Completion Requirements</td><td colspan="3">The minimum grade to pass this course is D (50%). Unless otherwise stated, a minimum grade of C- (55%) is required for this course to fulfil a prerequisite.</td></tr>
<tr><td>Course Designer(s)</td><td>Michael Wortis, Ph.D., Professor Emeritus, Department of Physics, Simon Fraser University</td><td>Consultant(s), if applicable</td><td>Neil Alberding, Ph.D., Department of Physics, Simon Fraser University and other SFU faculty/staff</td></tr>
<tr><td>Dean’s Approval</td><td>Marv Westrom, Ph.D. Professor Emeritus, Faculty of Education, University of British Columbia</td><td>Dean’s Approval Date</td><td>September 29, 2010</td></tr>
<tr><td>Curriculum Committee Approval Date</td><td>February 29, 2010</td><td>First Term Offered</td><td>Spring 2010</td></tr>
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Last Review Date	September 28, 2022	Next Review Date	September 28, 2027
Revision History	September 28, 2022-Minor revisions and updates by Kelly Cheung		

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