UNIVERSITY OF THE FRASER VALLEY

ORIGINAL COURSE IMPLEMENTATION DATE: September 2006
REVISED COURSE IMPLEMENTATION DATE: January 2018
COURSE TO BE REVIEWED: (six years after UEC approval) August 2023
Course outline form version: 09/15/14

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: PHYS 410	**Number of Credits:** 3 Course credit policy (105)
Course Full Title: History of Physics **Course Short Title (if title exceeds 30 characters):**	
Faculty: Faculty of Science	**Department (or program if no department):** Physics

Calendar Description:

Once students have learned how physics is performed in the current era, they should also learn how it all began. This course surveys the history of physics from its philosophical beginnings, to the 21st century advances affecting the modern world.

Prerequisites (or NONE):	Any 300-level Physics course.
Corequisites (if applicable, or NONE):	
Pre/corequisites (if applicable, or NONE):	NONE

Equivalent Courses (cannot be taken for additional credit)
Former course code/number:
Cross-listed with:
Equivalent course(s):
Note: Equivalent course(s) should be included in the calendar description by way of a note that students with credit for the equivalent course(s) cannot take this course for further credit.

Transfer Credit
Transfer credit already exists: ☐ Yes ☒ No
Transfer credit requested (OReg to submit to BCCAT):
☐ Yes ☒ No (if yes, fill in transfer credit form)
Resubmit revised outline for articulation: ☐ Yes ☒ No
To find out how this course transfers, see **bctransferguide.ca**.

Total Hours: 60
Typical structure of instructional hours:

Lecture hours	45
Seminars/tutorials/workshops	15
Laboratory hours	
Field experience hours	
Experiential (practicum, internship, etc.)	
Online learning activities	
Other contact hours:	
Total	**60**

Special Topics
Will the course be offered with different topics?
☐ Yes ☒ No
If yes, different lettered courses may be taken for credit:
☐ No ☐ Yes, repeat(s) ☐ Yes, no limit
Note: The specific topic will be recorded when offered.

Maximum enrolment (for information only): 24

Expected frequency of course offerings (every semester, annually, every other year, etc.): Based on student demand; normally once every 2 to 3 years

Department / Program Head or Director: Jeff Chizma	**Date approved:**	May 2017
Faculty Council approval	**Date approved:**	May 26, 2017
Campus-Wide Consultation (CWC)	**Date of posting:**	n/a
Dean/Associate VP: Lucy Lee	**Date approved:**	May 26, 2017
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	August 31, 2017

Learning Outcomes

Upon successful completion of this course, students will be able to:

- Accurately describe the foundations upon which modern physics has evolved by tracing the evolution of the subject through history.
- Identify the main events and individuals responsible for the birth of many areas of physics.
- Give reasons why the progression of scientific ideas was slowed during certain eras in human history.
- Solve a variety of historical physics problems spanning the many different areas.
- Utilize Newton's laws to show how Kepler's laws of planetary motion arise.
- Research and write a paper on a person or topic of historical significance in physics.
- Prepare assignments and papers using the typesetting markup language LaTeX.
- Describe how physics evolved from philosophy and astronomy to the field we know today.

Prior Learning Assessment and Recognition (PLAR)

☒ Yes ☐ No, PLAR cannot be awarded for this course because

Typical Instructional Methods (guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion)

Primarily lectures, supplemented by occasional videos as well as in-class student presentations based on their paper/project.

Grading system: Letter Grades: ☒ Credit/No Credit: ☐ Labs to be scheduled independent of lecture hours: Yes ☐ No ☐

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Text(s) and Resource Materials (if more space is required, download Supplemental Texts and Resource Materials form)

	Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1.	Motz, L. & Weaver, J.	The Story of Physics	☐	Avon Books	1989
2.	Rooney, A.	The Story of Physics	☐	Arcturus Publishing	2011
3.	Simonyi, K.	A Cultural History of Physics	☐	CRC Press	2012
4.			☐		
5.			☐		

Required Additional Supplies and Materials (software, hardware, tools, specialized clothing, etc.)

None

Typical Evaluation Methods and Weighting

Final:	25%	Assignments:	20%	Midterm exam:	%	Practicum:	%
Quizzes/tests:	%	Class Participation:	10%	Field experience:	%	Shop work:	%
Paper:	30%	Presentation:	15%	Seminar Presentation	%	Total:	100%

Details (if necessary):

Typical Course Content and Topics

The course will consist of a study of physics from its historical evolution from philosophy and astronomy, up to modern theories of the laws describing the forces responsible for the Universe in which we live. The following are a list of major branches of physics and some of the more important individuals responsible which may be covered. Due to time constraints and the breadth of material available, not all topics will generally be covered in detail.

- Historical overview
- Astronomy: Aristotle, Ptolemy, Copernicus, Kepler, Brahe, Galileo
- Classical Mechanics - Galileo, Newton, Lagrange, Hamilton, Halley, Hooke
- Fluids - Archemedes, Bernoulli, Navier, Stokes, Euler
- Optics - Newton, Young, Fresnel, Huygens, Fraunhoffer
- Thermodynamics - Carnot, Joule, Gibbs, Helmholtz, Kelvin, Avagadro, Clausius
- Statistical Physics - Boltzmann, Maxwell, Einstein, Bose, Fermi, Dirac
- Electromagnetism - Henry, Faraday, Ampere, Maxwell
- Radioactivity and Nuclear Physics - Bequerel, Curie, Rontegen, Bethe, Oppenheimer, Chadwick, Yukawa, Geiger
- Special and General Relativity - Einstein, Reimann, Mach, Michelson, Morely, Lorentz, Shwarzchild, Poincare, Kerr, Chandresekhar, Thorne, Wheeler, Minkowski
- Atomic Physics and Chemistry - Bohr, Rutherford, Dalton, Rydberg, Thompson, Hartree and Fock, Slater
- Quantum Mechanics - Bohr, Einstein, de Broglie, Schrodinger, Dirac, Feynman, Heisenberg, Pauli, Klein, Gordon, Bohm, Aspect, Bell, Planck, Compton, Born
- Solid State and Electronics - Bloch, Brillouin, Shockly, Miller, Bardeen, Cooper, Schiffer, Debye, Bragg
- Particle Physics - Feynman, Dirac, Gellmann, Glashow, Weinberg, Salam, Noether, Dyson, Fermi
- Cosmology - Hubble, Hawking, Penrose, Robertson, Walker
- GUT and the future - Green, Schwartz, Kaku, Witten