Lane Community College

Section 1. Proposed Course Outline (A general statement of course content that informs class syllabus construction. Once approved, all sections of a given course must include this content, no matter which instructor teaches the course, or the mode of delivery. Divisions must include this new course outline in the Divisional Course Outline binder as required by COPPs.)

Course Number: PH 190 Full Course Title for print catalog: **Physics Investigation Laboratory**

Abbreviated Course Title for Banner: Physics Investigation Lab (30 character limit)

Prerequisites: Physics course with a C or better; Math 95; or instructor consent

Co-requisites:

Grade Option: ☒ Graded (with P/NP option) ☐ Pass/No Pass only

Number/Type Credits	Term Minimum Contact	Term Maximum Contact	11-Week Term Contact
1-2 Lecture	10-20 hours (lecture credits x 10)	12-24 hours (lecture credits x 12)	11-22 hours (lecture credits x 11)
__ Lec/Lab	__ hours (lec-lab credits x 20)	__ hours (lec-lab credits x 24)	__ hours (lec-lab credits x 22)
1 Lab	30 hours (lab credits x 30)	36 hours (lab credits x 36)	33 hours (lab credits x 33)
2-3 **Total credits (sum)**	40-50 **Total hours (sum)**	48-60 **Total hours (sum)**	44-55 **Total hours (sum)**

Course Description (300 character limit):

A rich undergraduate research experience in which students learn to think as scientists, gather and manage data, and individually and collectively develop useful questions and conclusions. Goals include design, exploration and testing appropriate to science and engineering.

Course Outcomes and Proficiencies

What will the student ***know*** or ***be able to do*** at the end of the course?

What ***attitudes*** related to the subject will the student hold?

Assessments Planned

What evidence will demonstrate that students have achieved course outcomes? (assessment tools may include departmental tests, written products, portfolios, juried performances, quizzes and exams, or alternative assessments such as qualitative studies, capstone projects, external reviewers, etc.)

Upon successful completion of this course, the student will:	**How each outcome will be assessed:**
Make appropriate decisions, converse and write with significant conceptual precision about measurement, the use of applicable scientific equipment to conduct experimental investigation, the design of experiments, and evaluation of results, and draw conclusions about possible explanations.	quality and extent of investigation progress contained in final project, group reports, lab notebook, experimental design, measurements and data analysis, reports of specific subjects of research methodology.
Formulate questions to move their thinking forward concerning a system being investigated and monitor their thinking for consistency and reasonableness.	quality of group reports, lab notebook, journal entries
Understand and communicate elements and distinctions involving experimental design, exploration and testing.	quality of group reports, final presentation, class participation, lab notebook, experimental design; quizzes
Understand and communicate elements and	quality of group reports, lab notebook, experiment

distinctions involving data gathering, data analysis and framing, research ethics, and the analysis of uncertainty.	design; quizzes
Make limited, useful literature searches for experimental results. Make reports and presentations about research.	quality of group reports, final presentation; quizzes
Understand and make use of mathematical modeling and representation and unit analysis.	quality of data analysis; quizzes
Be able to take advantage of research opportunities in their future academic life.	quality of REU application, final research report and presentation
Students will gain increased understanding of some current areas of research and their impacts on human society and environment.	Journal entries, quizzes, final exam

Course Content by Major Topics

What topics will be presented? What are the main activities of the course? What are the central themes? (See sample at http://www.lanecc.edu/cops/format3.htm.)

Topics:

General introduction to the physical situation being researched.

Research organization.
- In general
- In our lab

The nature of experiment
- In science and engineering
- Testing experiments
- Exploration experiments
- Experimental design
- Ethics

Data collecting and measurement uncertainty
- Strategies of data collecting and framing
- Representing and analyzing uncertainties
- Lab notebook use

Data analysis
- Mathematical modeling and representation
- Scaling and unit analysis

Undergraduate research
- Role in education
- Opportunities

Research reports and presentations

Section 2. Proposal Information

Course Developer:
Dennis Gilbert
Date: 4-25-13
Catalog year to take effect:
2012-2013___
2013-2014_X__

Type of Proposal
☒ New course
☐ Currently 199 or 299
☐ Experimental Course
☐ 199 Special Studies
☐ 299 Trends
☐ Revised course (If increasing credits, use credit change form)
☐ Reactivated course with no change
☐ Reactivated course with changes

Type of Course:
☒ Lower Division Collegiate (transfer)
☐ Professional/Technical (required or elective)
☐ Developmental, numbered below 100

Rationale:
How does this proposal further the goals of the program or department?
This kind of experience is supported by the Science division and by the Physics discipline. The Division currently has a Work Group on Undergraduate Research Experience
What assessment evidence supports this proposal?
Undergraduate research experiences enhance interest and persistence in science careers in students generally and from under-represented groups in STEM fields.
How do you know there is a demand for this course?
Interest in the Science Division staff, the value placed on it by institutions into which students transfer, and polling among students. In particular, approximately half of the students in PH 212 and PH 213 this term expressed interest if the course had been offered previously, and most of them were interested in taking it in the coming fall.

Section 3. Curriculum Equity (http://www.lanecc.edu/cops/curric.htm)

To promote an environment where all learners are encouraged to develop their full potential, this course will support Lane's Curriculum Equity policy in the following way(s):
Undergraduate research experience is increasingly required for successful advancement through higher education, and the availablity of this experience as a freshman or sophomore is increasingly required for research experience as a junior or senior. This course offers increased access to such experience and models a format available to more students.

Section 4. For revised courses only: PREVIOUS Catalog/Course Information:

Course Number: _____ Course Title in Banner: _____ (30 characters maximum)

Full Course Title in print catalog:

Prerequisites:

Co-requisites:

Grade Option: ☐ Graded (with P/NP option) ☐ Pass/No Pass only

Number/Type Credits	Term Minimum Contact	Term Maximum Contact	11-Week Term Contact
__ Lecture	__ hours (lecture credits x 10)	__ hours (lecture credits x 12)	__ hours (lecture credits x 11)
__ Lec/Lab	__ hours (lec-lab credits x 20)	__ hours (lec-lab credits x 24)	__ hours (lec-lab credits x 22)
__ Lab	__ hours (lab credits x 30)	__ hours (lab credits x 36)	__ hours (lab credits x 33)

__ Total credits (sum) **___ Total hours (sum)** **___ Total hours (sum)** **___ Total hours (sum)**

Course Description:

What will change? ☐Course Number ☐Title ☐Course Description ☐Credit hours ☐Contact hours

Section 5. Support Courses **(New Professional/Technical course proposals must complete.)**

Professional/Technical courses are tracked within programs for purposes of Carl Perkins funding and budgetary planning. Indicate all degree or certificate programs for which this course will be required.

Program	Division

Section 6. Overlap Courses **(New course proposals must complete.)**

While overlap of course materials is not necessarily a flaw, duplication of course materials may lead to inefficient use of college resources. If there is overlap, the faculty of overlapping courses must agree on the extent of overlap and attach a rationale explaining its necessity.

Indicate all departments/courses that this course may overlap. Division Dean of existing course enters one of two options at right. Note: N/A is not an option.

Options:
1. No overlap.
2. Approved: overlap is acceptable. Rationale attached.
3. Disapproved: reasons attached.

Division	Course Number / Title	% Overlap	Option	Division Dean of existing course (Signature required for all options)	Date

Section 7. Qualification to fulfill degree requirements (complete all relevant forms, available at http://www.lanecc.edu/currsched/index.html and send to Mary Brau for the Degree Requirements Review Committee):

X☐ Form(s) applying for the following degree requirement status have been attached. (Only check this box when forms have been completed and attached.)

AAOT, ASOT-Bus, OTM:

☐ Arts & Letters

☐ Social Sciences

X☐ Science /Computer Science

☐ Mathematics

☐ Cultural Literacy Option

All degrees:

☐ Health/Wellness/Fitness

AAS, 1-year and 2-year certificates:

☐ Human Relations

Optional designation:

☐ Sustainability status

Section 8. Library Impact Statement

Under accreditation standards, Library consultation is essential for new programs, new courses and for substantively revised courses when the revisions entail any change in library use.

What assignments will require the use of library and information resources?
Literature search introduction, and specific literature search on subject matter of lab. Note: UO library is also available to help, and introducing prospective UO transfer students to the Science Library is a positive experience to the extent the LCC is not able to meet all the needs of the students.

Each academic area has a Liaison Librarian (http://www.lanecc.edu/library/services/liaison.htm). Contact the designated librarian to discuss the library needs of your course. Please allow the librarian at least one week to assess library resources.

To be completed by Liaison Librarian:
☒ Library resources are adequate to support this proposal.
☐ Additional resources are needed but can be obtained from current funds.
☐ Significant additional Library funds/resources are required to support this proposal.

Liaison Librarian _____ Date _____

Section 9. Divisional Approval (To be completed by Division Chair and Administrative Assistant)

Human, Physical, and Financial Resources:
☐ Additional instructional costs (staff, materials, services or facilities) will be incurred to offer this course. Source of funding:

☒ No additional instructional resources (staff, materials, services or facilities) are needed to offer this course.
Explain:

Required Certifications:
☒ We have developed minimum course certification standards according to the COPPs procedure "Instructor Qualifications: Credit," to be filed with ASA upon course approval.
☒ We have completed faculty certification form(s) for faculty qualified to teach this course, to be filed with ASA and Human Resources upon course approval.

Fees:
☐ We have completed fee rationale and fee request forms to be submitted to ASA upon course approval, in compliance with the COPPs procedure, "Fees: Special"
☒ No special fees will be required for this course.

Divisional Recommendation:
☒ The Division Chair and Administrative Assistant have reviewed this course proposal and kept a copy for divisional files.
☒ Faculty review of this course was completed within the division on May 2, 2013(date).

☒ Pass ☐ Do Not Pass

Administrative Assistant/Coordinator _____ Date _____

Academic Dean _____ Date _____

Section 10. College Approval

Curriculum Committee Chair _____ Date _____

Curriculum Approval Committee hearing: _____ Date _____

Executive Dean for Academic Affairs _____ Date _____

Vice President for Academic & Student Affairs _____ Date _____