PHYS 101

California State University, San Marcos General Education Program
GENERAL EDUCATION NEW COURSE CERTIFICATION REQUEST
• AREA B1/B3: Physical Science with a Lab Component

See GE Handbook for information on each section of this form

ABSTRACT

Course Abbreviation and Number: PHYS 101 **Number of Units: 4**	**Course Title: Introduction to Physics I**	
College or Program: ☐CHABSS ☒CSM ☐CEHHS ☐COBA ☐Other_____	**Desired term of implementation:** ☐Fall ☒Spring ☐Summer Year: 2016	**Mode of Delivery:** ☒ face to face ☐ hybrid ☐ fully on-line
Course Proposer (please print):Chuck De Leone	**Email: cdeleone@csusm.edu**	**Submission Date:**

1. Course Catalog Description: An overview of the principles of mechanics, thermodynamics, and waves. The areas covered include: observation and measurement, kinematics, dynamics, work and energy, impulse, and momentum, fluids, heat and temperature, oscillations, and waves in mechanical media. Three hours of lecture and three hours of laboratory. Enrollment Restriction: Completion of the Lower-Division General Education requirement in Mathematics/Quantitative Reasoning (B4). Enrollment Requirement: Completion of a course in trigonometry at the high school or university level.

2. GE Syllabus Checklist: The syllabi for all courses certified for GE credit must contain the following:

☒	Course description, course title and course number
☒	Student learning outcomes for General Education Area and student learning objectives specific to your course, linked to how students will meet these objectives through course activities/experiences
☒	Topics or subjects covered in the course
☒	Registration conditions
☒	Specifics relating to how assignments meet the writing requirement
☒	Tentative course schedule including readings
☒	Grading components including relative weight of assignments

SIGNATURES

see email 9/17/15
Course Proposer Date

see email 9/17/15
Department Chair date

Please note that the department will be required to report assessment data to the GEC annually. _____ *DC Initial*

		Support	Do not support*
Library Faculty	Date	☒	☐
Impacted Discipline Chair	Date	☐	☐
Impacted Discipline Chair	Date	☐	☐
GEC Chair	Date	Approve ☒	Do not Approve ☐

*** If the proposal is not supported, a memo describing the nature of the objection must be provided.**

Course Coordinator: Charles De Leone Phone: ext: 8074 Email:cdeleone@csums.edu

Virginia Mann

Subject: FW: PHYS 101 Recert
Attachments: PHYS101_B1_B3_Recert.pdf; PHYS101Summer2015Syllabus.pdf

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From: Charles De Leone <cdeleone@csusm.edu>
Date: Friday, September 18, 2015 at 10:20 AM
To: Yvonne Meulemans <ymeulema@csusm.edu>
Cc: Julie Jameson <jjameson@csusm.edu>, Edward Price <eprice@csusm.edu>
Subject: Re: PHYS 101 Recert

Hi Yvonne,

Please use the two forms attached for PHYS 101 recert as opposed to previous e-mail.

It looks like I may have send the wrong syllabus with the form (Sent GES 105 syllabus - it should have been PHYS 101). Here is a replacement copy of both.

My very best,

Chuck

From: Yvonne Meulemans
Sent: Thursday, September 17, 2015 4:06 PM
To: Charles De Leone
Cc: Julie Jameson; Edward Price
Subject: Re: PHYS 101 Recert

Thank you! I will put on the agenda for next week's GEC.

On Sep 17, 2015, at 3:55 PM, Charles De Leone <cdeleone@csusm.edu> wrote:

> Hi Yvonne and Julie,
>
> Attached is another course for recertification consideration - PHYS 101, a 4 Unit lab and lecture.
>
> We have library sign off. (below)
>
> Thanks again, and my best regards,
>
> Chuck De Leone

Library

Virginia Mann

Subject: FW: PHYS 101 Recert
Attachments: PHYS101_B1_B3_Recert.pdf; PHYS101Summer2015Syllabus.pdf

From: Talitha Matlin
Sent: Thursday, September 17, 2015 3:32 PM
To: Charles De Leone
Cc: Edward Price; Yvonne Meulemans
Subject: Re: PHYS 101 Recert

Hi Chuck,

This recert looks good to me and has the library sign-off. Since the final paper requires 5 outside sources, please have instructors contact me when they are about to teach so that I can either provide in-person or on-line (via a customized course guide) instruction for their students.

As an FYI, I will be on leave starting tomorrow, Sept 18, and returning to work on February 22. For library sign off on any further recertifications, please contact Yvonne Meulemans in my absence.

Best,
Taltha

From: Charles De Leone <cdeleone@csusm.edu>
Date: Thursday, September 17, 2015 at 2:51 PM
To: Talitha Matlin <tmatlin@csusm.edu>
Cc: Edward Price <eprice@csusm.edu>
Subject: PHYS 101 Recert

Hi Talitha,

(here is one more!)

We are seeking GE recertification for PHYS 101, a lower-division B1-B3 class taught by Physics. As part of the process, we seek approval from the library.

The PHYS 101 recertification form and a copy of the syllabus is attached. If you are OK with the re-cert, I think an e-mail to that effect will suffice. If not, please contact Ed Price and myself and we will respond to any questions.

Thanks (again!) for your help with this and my very best regards,

Chuck De Leone

<PHYS101Summer2015Syllabus.pdf>

<GES 105-B1_recert_syllabus.pdf>

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Part A: B/B3 Physical Science with Lab General Education Learning Outcomes (GELOs) related to course content. [Please type responses into the tables.]

Physical Science w/ Lab GELOs this course will address:	**Course content that addresses each GELO.**	**How will these GELOs be assessed?**
B1.1 Students will explain accepted modern physical or chemical principles and theories, their areas of application, and their limitations.	The course introduces basic physics principles, using physical models to solve problems, as well as the application of physics to current challenges presented faced by society. Topics may include: 1) Motion and Forces 2) Momentum and Energy 3) Atomic Nature of Matter and Thermodynamics 4) Waves and Sound	Each day students are required to participate in in-class problem solving. Students are also assigned homework that focused on physics problem solving. Exams are given periodically through the course, and a final exam is assigned that includes a written portion. Laboratory portion of the course requires students to turn in weekly lab write-ups. A final paper on a physics related topic requires use of on-line resources and library resources beyond course materials.
B1.2 Students will apply the discipline's customary methods to solve problems through data collection, critical evaluation of evidence, the application of quantitatively rich models, and /or employment of mathematical and computer analysis.	Students will learn mathematically rich physical models, and then apply those models to problem solving. For example, students would learn about newton's model of dynamics and then apply an analysis of forces acting on an object to determine the objects future motion.	Student understanding of physical principles and basic facility at applying physical models to solve problems is assessed via homework, exams, and final exams. This includes assessing the students' use non-algebraic representations such as force diagrams or graphs in their analysis/explanation of phenomena.
B1. 3 Students will be able to articulate what makes a good scientific theory, incorporating values of parsimony, agreement with experimental or observational evidence, and coherence with other mathematical or physical theories.	Course elements include learning about the historical steps in the development of modern physical theories, including why prior physical theories (Ptolemaic, Aristotelian, etc…) were jettisoned in favor of modern theories. Also, laboratories in the course focus on the match between experimental evidence and physical models.	Students' will be in this area via their analysis of laboratory data and subsequent written discussion on the data's agreement with specific theoretical models. Note some laboratories require students to debunk models that do not match data. An example is a pendulum lab where students find that the period of a pendulum does not depend on mass of bob.
B1.4 Students will be able to identify areas in which ethics either (1) directs or limits physical science research or (2) is informed by the products of this research	Conservation of energy is a central to physics and this course. During the course, energy efficiency is discussed and applied to various everyday devices and generators such as solar panels and other generation forms. This information helps informs student decision making about energy policy and the environment.	Students' ability to identify ethical considerations can be assessed on exams, homework or in the final paper. As an example, a chapter on thermodynamics discusses the caloric intake of the body and the calories burned during various human activities. This data provides context for a discussion on maintaining human health by matching caloric intake with activity levels.

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B3.1 Students will demonstrate that they can conduct experiments, make observations, or run simulations using protocols and methods common in the scientific discipline in which the course is offered.	Each week of the semester the students perform an experiment in a three-hour long laboratory session. A laboratory manual developed by the physics departments contains fifteen labs on varying topics. The laboratories are designed to promote experimental inquiry into physical theories, and help them better understand the theories being studied.	Lab instructors perform assessment of laboratory write-ups. Areas of emphasis for assessment include: completion, quality of critical thinking and clarity of written expression, along with use of non-algebraic representations such as graphs and force diagrams.
B3.2 Students will be able to interpret the results of experiments, observations or simulations, understanding random and systematic errors associated with those activities, and making appropriate conclusions based on theories or models of the scientific discipline in which the course is offered.	Requirements for labs include error analysis, and graphical representation of data, including the ability to analyze graphical data to reach conclusions.	Lab instructors perform assessment of laboratory write-ups. Another area of assessment is graphical representations of data, and interpretations of that data (error bars, best fit lines, slope, etc…)

Part B: General Education Learning Outcomes required of all GE courses related to course content:

GE Outcomes required of <u>all</u> Courses	**Course content that addresses each GE outcome?**	**How will these GELOs be assessed?**
Students will communicate effectively in writing to various audiences. (writing)	While writing skills are not explicitly taught in this course, writing is an integral part of the final paper and laboratory write-ups. There is also a written portion of the final exam that evaluates students' ability to think scientifically.	Written portions of the exams and final paper and laboratories will necessarily be assessed for clarity and coherence, as this is essential to scientific argumentation/communication.
Students will think critically and analytically about an issue, idea or problem. (critical thinking)	The final paper offers students a chance to focus on one specific issue or area of research associated with physics. Also laboratories allow students to focus in on the experimental underpinnings of particular theories.	This is assessed on the final paper and in laboratory write-ups.
Students will find, evaluate and use information appropriate to the course and discipline. (Faculty are strongly encouraged to collaborate with their library faculty.)	The course provides the basis for a fuller understanding of how scientists think and approach problems as well as how science interacts with society. The final paper necessitates the use of appropriate resources from outside the course, including accessing on-line or library resources in the writing of the research paper.	The final paper requires bibliographic citations of all on-line or library sources used.

Part C: GE Programmatic Goals: The GE program aligns with CSUSM specific and LEAP Goals. All B1/B3 courses must meet at least one of the LEAP Goals.

GE Programmatic Goals	***Course addresses this LEAP Goal:***
LEAP 1: Knowledge of Human Cultures and the Physical and Natural World.	☐ *No* ☒ *Yes*
LEAP 2: Intellectual and Practical Skills	☐ *No* ☒ *Yes*
LEAP 3: Personal and Social Responsibility	☐ *No* ☒ *Yes*
LEAP 4: Integrative Learning	☐ *No* ☒ *Yes*

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CSUSM Specific Programmatic Goals	**Course content that addresses the following CSUSM goals. Please explain, *if applicable.***
CSUSM 1: Exposure to and critical thinking about issues of diversity.	☒ *No* ☐ *Yes (please describe):*
CSUSM 2: Exposure to and critical thinking about the interrelatedness of peoples in local, national, and global contexts.	☐ *No* ☒ *Yes (please describe): Discussions on energy/matter/resources may naturally include discussions on global warming, radiation, pollution, etc… that effect all people in local, national, and global ways.*

Part D: Course requirements to be met by the instructor.

Course Requirements:	**How will this requirement be met by the instructor?**
Course meets the All-University Writing requirement: A minimum of 2500 words of writing shall be required in 3+ unit courses.	The final paper, along with written laboratories fulfill the writing requirement.
Courses shall include an evaluation of written work which assesses both content and writing proficiency, using a writing style and use of language that is appropriate for the sciences.	Instructors evaluate final paper, laboratories, and exam questions for both clarity and correctness of scientific argumentation/content.
Courses should demonstrate to students that the applications of physical science principles and theories can lead to lifelong learning in science and to productive and satisfying life choices.	Course content, materials, and instructor presentations include discussions applications of science to everyday life (e.g. simple household electricity, etc..)
Courses should demonstrate to students the ways in which science influences and is influenced by societies in both the past and the present.	Historical development of science content for some materials provides context for how scientific progress is related to societies (e.g. Galileo's contribution to understanding of motion, the centrality of thermodynamics to the industrial revolution, etc…)
Courses should empower students to communicate effectively to others about scientific principles and their application to real-world problems.	Both in-class discussions and written laboratory responses explicitly encourage this. An example is the use of insulation in reducing heating and cooling requirements.
Courses shall build the students' information literacy in a way that is appropriate to the field and level of the course.	Student will learn to interpret and evaluate technical and scientific data and learning along with learning how to seek resources outside of the course.
Courses shall require students to think critically so that they are able to distinguish scientific arguments from pseudo-scientific myths or opinions.	By its nature, physics requires critical thinking. In-class discussions and laboratory experiments force students to confront physical ideas that do not match their pre-conception and thus allow students to develop more correct physical models for the world.

Physics 101: Introduction to Physics I
Syllabus (Summer Session 1 2015)

Cougar Courses: cc.csusm.edu for lecture notes and syllabus

Homework Web Page: www.masteringphysics.com

Course ID: MPDELEONE21956

Instructors: Prof. Charles De Leone and **Prof. Stephen Tsui**
Office: SCI-2, Room 213 and SCI-2 Room 217 respectively
Office Hours: Monday 11:10 – 12:10 PM and Wednesday 2:45 – 3:45 PM
Lectures: Monday, Tuesday, Wednesday, and Thursday SCI2 Room 245, 9:00 - 11:10 PM
Laboratory: Monday, Tuesday, and Wednesday SCI2 Room 245, 12:00 - 2:45 PM
E-mail: **cdeleone@csusm.edu and stsui@csusm.edu (use PHYS 101 in Subject Line)**
Textbook: Knight, ***College Physics***, 3rd Edition, 2015
Course Description: An overview of the principles of mechanics, thermodynamics and waves. The areas covered include: observation and measurement, kinematics, dynamics, work and energy, impulse, and momentum, fluids, heat and temperature, oscillations, and waves in mechanical media. Three hours of lecture and three hours of laboratory.
Prerequisite: Completion of the Lower-Division General Education requirement in Mathematics/Quantitative Reasoning (B4). Completion of a course in trigonometry at the high school or university level.

General Education Learning Outcomes:
Upon completion of this coursework, students will be able to:

1. Describe and/or apply principles and methods that are necessary to understand the physical and natural world.
2. Think critically and analytically about an issue, idea or problem, considering alternative perspectives and re-evaluation of one's own position.
3. Apply numerical/mathematical concepts in order to illustrate fundamental concepts within fields of study.

Physics Learning Outcomes:

1. Be able to apply Newton's laws of motions (both linear and angular forms) to solve a wide variety of physics problems.
2. Be able to use the laws of conservation of momentum and energy to analyze problems.
3. Understand the basics of thermodynamics, oscillations and waves.

Writing requirement *for this course is met through a final paper and written laboratory reports.* Lab reports will be graded on four items: **Completeness, Demonstrated Reasoning, Accuracy,** and **Writing** (using complete sentences and paragraphs with proper punctuation and spelling).

Tentative Course Schedule and Readings:

Week 1: Chapters 1, 2, and 3

Lecture 1: Introduction
Lecture 2: Representing Motion
Lecture 3: Motion in One Dimension
Lecture 4: Vectors an Motion in Two-Dim, and review

Week 2: Chapters 3, 4, and 5

Lecture 5: Forces and Newton's Laws of Motion
Lecture 6: **Exam 1 (40 minutes)** Applying Newton's Laws
Lecture 7: Applying Newton's Laws Continued
Lecture 8: Introduction to circular motion, and Review

Week 3: Chapters 6, 7, and 8

Lecture 9: Circular Motion, Orbits, and Gravity
Lecture 10: **Exam 2 (40 minutes)** Circular Motion cont'd, Rotational Motion (reduced),
Lecture 11: Equilibrium and Elasticity (statics)
Lecture 12: Review

Week 4: Chapters 9, 10, and 11

Lecture 13: Momentum
Lecture 14: **Exam 3 (40 minutes)** Energy and Work
Lecture 15: Energy and Work and Using Energy
Lecture 16: Using Energy and Review

Week 5: Chapters 12, 13, 14 and 15

Lecture 17: Ideal Gases and Fluids/Oscillations and Waves
Lecture 18: **Exam 4 (40 minutes)** Oscillations and Waves Cont'd
Lecture 19: Review (Final Exam in the Lab Period)

Final Exam July 2 in Lecture
Course Grading (see below for details):

Homework/Exam Grade
20% Homework
40% Midterm Exams (Best 3 of 4)
35% Final Exam
5% Final Paper
Final Grade = Homework/Exam Grade as modified by Lab Grade

Homework: Homework will be done and graded completely on-line using MasteringPhysics©, an on-line homework system provided with the textbook. Students must purchase an access code that comes with the textbook or order it separately on-line. All assignments and due-dates are posted on the MasteringPhysics website. Students must set up their MasteringPhysics account at this website:

http://www.masteringphysics.com/

Course ID: MPDELEONE21956

Most homework problems are "Tutorials" designed to teach students concepts using a step-by-step approach. Hints and help are provided for almost all homework problems. You will generally be allowed 6 attempts to answer numerical questions. You may receive less than full credit if you make wrong answers and/or use the hints provided. You may get credit back if you answer the hint questions correctly. You will be penalized for any work submitted after the due date. If the website is not functioning properly, you may miss the due date and be penalized for late work. Please plan accordingly.

Midterm Exams:

There will be four midterm exams. **I will drop your lowest midterm exam score and use your best three exam scores to calculate your grade.** Please make sure your calendar accommodates these exams, as there will be no make-up exam scheduled:

Midterm Exam I:	Tuesday, 6/914	(At the beginning of the regular class period)
Midterm Exam II:	Tuesday, 6/16/14	(At the beginning of the regular class period)
Midterm Exam III:	Tuesday, 6/23/14	(At the beginning of the regular class period)
Midterm Exam IV:	Tuesday, 6/30/14	(At the beginning of the regular class period)

The exams are closed-book; however, you may bring a single, double-sided 8 1/2 X 11 sheet of notes and equations to aid your memory. Each exam will tend to focus on the material covered since the previous exam; however, the sequential nature of the topics in the course means that to solve any given question, you will almost certainly need to make use of concepts, techniques, and principles going back to the beginning of the course (and to the math you've learned before taking this course). Exam questions will typically be similar to homework problems and examples shown during lectures.

Final Paper: A library research project on a topic of our joint choosing. Project will result in a 10 page typed double-spaced report with at least 5 citations due near the end of the semester. Details to follow.
Laboratory: For much of the lab time, you will be working in a small group of five or fewer students. You will design and perform simple experiments to explore physics concepts, discuss the results of these experiments with your small group and the class as a whole, and work within your small group and in the class to gain an understanding of how these concepts can be applied to a wide range of real-world problems and situations. When you leave class, you may have explicit assignments or lab write ups to work on before coming to the next class meeting.

You are expected to participate in both your small group and the whole class discussions, activities, and experiments, and to have completed any out-of-class assignments. **Attendance at lab is mandatory. If you must miss a lab inform the instructors ahead time via e-mail, phone or in person.** See the participation and preparation section below for the effect of unexcused absences on your grade.

Lab Grade: The lab portion of your grade deals with participation and preparation. This grade is determined by your preparation for class including completion of the lab assignments, and participation in lab including attendance willingness to work in groups, and in-class presentations. The grades shown below modify your Homework/Exam grade.

HP---High pass--increases your homework/exam grade by 2.5 points (on the 0-100 scale). However, a high pass will not raise an "A" to an "A+."

P---Pass--does not change your homework/exam grade.

LP---Low pass--decreases your homework/exam grade by 2.5 points.

U---Unsatisfactory--decreases your homework/exam grade by 10 points (i.e., a whole letter grade: "B-" to "C-", or "B" to "C", etc.).

F---Fail the course.

Attendance is central. With three unexcused lab absences, your highest Lab Grade is a low pass. With four unexcused lab absences, your highest Lab Grade is unsatisfactory. Five or more unexcused Lab absences is totally unacceptable, and you will fail Physics 101. Low passes will also be given for chronic tardiness, leaving early, lack of active participation, incomplete lab assignments, and behavior that contributes negatively to the productive functioning of the small groups

Final Exam: The final exam will be held on **July 2 in the lecture**. This date and time are not negotiable; please make sure your calendar can accommodate the exam. The final exam will be comprehensive - it will cover the entire semester. The exam is closed book, however you may bring three (2) sheets 8"x11" of notes (front and back) to aid your memory.

Academic Honesty Policy:
"Students will be expected to adhere to standards of academic honesty and integrity, as outlined in the Student Academic Honesty Policy. All written work and oral presentation assignments must be original work. All ideas/material that are borrowed from other sources must have appropriate references to the original sources. Any quoted material should give credit to the source and be punctuated with quotation marks.

Students are responsible for honest completion of their work including examinations. There will be no tolerance for infractions. If you believe there has been an infraction by someone in the class, please bring it to the instructor's attention. The instructor reserves the right to discipline any student for academic dishonesty, in accordance with the general rules and regulations of the university. Disciplinary action may include the lowering of grades and/or the assignment of a failing grade for an exam, assignment, or the class as a whole."