To FECC 04/24/12

SCI 105 Physical Science I – Modification to meet the New Liberal Studies Curriculum

LSC Use Only Proposal No:	*UWUCC Use Only* Proposal No: 11-164
LSC Action-Date: AP-4/19/12	UWUCC Action-Date: AP-4/24/12 Senate Action Date: App-5/1/12

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

Contact Person(s) **Stan Sobolewski**	Email Address **sobolews@iup.edu**
Proposing Department/Unit **Physics**	Phone **7-4590 or 7-2370**

Check all appropriate lines and complete all information. Use a separate cover sheet for each course proposal and/or program proposal.

1. Course Proposals (check all that apply)

____ New Course ____ Course Prefix Change ____ Course Deletion

X Course Revision ____ Course Number and/or Title Change ____ Catalog Description Change

Current course prefix, number and full title: ***SCI 105 Physical Science I***

Proposed course prefix, number and full title, if changing:

2. Liberal Studies Course Designations, as appropriate

X This course is also proposed as a Liberal Studies Course (please mark the appropriate categories below)

____ Learning Skills X Knowledge Area ____ Global and Multicultural Awareness ____ Writing Intensive (include W cover sheet)

____ Liberal Studies Elective (please mark the designation(s) that applies – must meet at least one)

____ Global Citizenship ____ Information Literacy ____ Oral Communication

____ Quantitative Reasoning ____ Scientific Literacy ____ Technological Literacy

3. Other Designations, as appropriate

____ Honors College Course ____ Other: (e.g. Women's Studies, Pan African)

4. Program Proposals

____ Catalog Description Change ____ Program Revision ____ Program Title Change ____ New Track

____ New Degree Program ____ New Minor Program ____ Liberal Studies Requirement Changes ____ Other

Current program name:

Proposed program name, if changing:

5. Approvals	**Signature**	**Date**
Department Curriculum Committee Chair(s)		4/23/2012
Department Chairperson(s)		4/23/2012
College Curriculum Committee Chair		4/23/12
College Dean		4/23/12
Director of Liberal Studies (as needed)		4/24/12
Director of Honors College (as needed)		
Provost (as needed)		
Additional signature (with title) as appropriate	Edel Reilly UECC Chair AKS	4/24/12
UWUCC Co-Chairs	Gail Sechrist	4/24/12

Received
APR 30 2012
Liberal Studies

1 Curriculum Proposal Cover Sheet (see above)

2. Course Syllabus (New Department Record of syllabus)

I. CATALOG DESCRIPTION

SCI 105 PHYSICAL SCIENCE I 3c-2l-4cr

A descriptive and conceptual course in physics for the non-science major. High school physics is not a prerequisite. Course content is designed to develop an understanding and appreciation of the physical world around us, to produce changes in attitude and background essential for our modern society, and to clarify the following topics: motion, heat, sound, light, electricity, magnetism, and the structure of matter.

II. COURSE OBJECTIVES

1) The students will develop an understanding of the role of physics in describing various phenomena in nature, such as motion, energy, electricity, and waves.

EUSLO 1 *Informed Learners* and EUSLO 2 *Empowered Learners*

Rationale: The homework and class assignments will ask students to examine specific phenomena and use the concepts of physics to explain that phenomena. An example is the motions of a car. When a student is asked to describe a car's motion, terms such as velocity and acceleration must be used by the student to provide a complete description.

2) Students will use the processes of observation, classification, and generalization in the laboratory.

EUSLO 1 *Informed Learners* and EUSLO 2 *Empowered Learners*

Rationale: The laboratory portion of the course will provide opportunities for the student to classify forces, motion, energy, and other physical phenomena. Almost every lab investigation will require students to make and record observations.

3) The students will be able to explain in terms of the physical processes involved, some of the more common natural phenomena.

EUSLO 1 *Informed Learners* and EUSLO 2 *Empowered Learners*

Rationale: In both the lecture and laboratory portion of the class, students will be presented with a physical process, such as color mixing or lightning. Physical principles such as the wave nature of light or electrostatics will be used by the students to explain these phenomena.

This will empower the students to explain other phenomena in nature they may run across during their life.

4) Students will be able to use mathematics, demonstrating both algebraic and graphical techniques to arrive at numerical answers for scientific problems.

EUSLO 1 *Informed Learners* and EUSLO 2 *Empowered Learners*

Rationale: Modeling physical phenomena mathematically will allow the students to make predictions and estimates in their lives. The ability to create graphical mathematical models from which predictions can be made is a characteristic of empowered learners.

5) The students will be able to make intelligent judgments concerning the worth of applications of science.

EUSLO 1 *Informed Learners* and EUSLO 2 *Empowered Learners*

Rationale: Informed learners know factual information; empowered learners use these facts to benefit themselves as well as others. Various technological developments will be discussed and the underlying physics principles will be identified by the students. For example, cell phone hazards can be examined. The radio frequencies used in these devices are not ionizing, yet impart energy to the head. Students will discuss the worth of the cell phone in light of the energy imparted to the brain.

6) Provide an understanding of some of the "great moments" in the history of physics and the individuals, including women and minorities, responsible for them.

EUSLO 1 *Informed Learners* and EUSLO 2 *Empowered Learners*

Rationale: Informed and empowered learners should be conscious of "great moments" in history. These will be discussed in the lecture portion of the class, and included in the outside reading. Students will demonstrate knowledge of these great moments through homework and tests.

Key assessment matrix as required by the TECC

(This course is required by Middle Level -grade 4 through 8 – science content teacher candidates)

Course Outcome	Conceptual Framework (Danielson)	INTASC standard	NCATE/NSTA Standards	Course assessment measuring outcomes
1	1a	1	1a,1b,1c,1d,1e,2a,2b	**Test** & Homework
2	1a	1	1a,1b,1c,1d,1e,2a,2b	**Laboratory Assessment**
3	1a	1	1a,1b,1c,1d,1e,2a,2b	Test & Homework
4	1a	1	1a,1b,1c,1d,1e,2a,2b	Test & Homework
5	1a	1	1a,1b,1c,1d,1e,2a,2b	Test & Homework
6	1a	1	1a,1b,1c,1d,1e,2a,2b	Test & Homework

Course assessments **underlined in bold** are to be designated as key assessments

LAB OBJECTIVES

1) Student will perform investigations that exemplify the concepts presented in lecture

EUSLO 1 *Informed Learners*

Rationale: Science is a hands-on activity. When the students have an opportunity to measure, record data, and formulate hypotheses, the concepts discussed in lecture will become more apparent to the student.

2) Students perform investigation so they become familiar with the systems of measurement and the instruments associated with those systems

EUSLO 1 *Informed Learners* and EUSLO 2 *Empowered Learners*

Rationale: In every laboratory investigation, students will take data in various units. Force, time, current, electric potential, and magnetic field, are some of the phenomenon that will be measured and in each instance the student will need to record a proper unit. The very concept of a unit implies quantization. The knowledge that the world is quantifiable is empowering.

3) To allow the student to become familiar with various analytical techniques, including graphing and graphical analysis of the data.

EUSLO 1 *Informed Learners* and EUSLO 2 *Empowered Learners*

Rationale: In every investigation, the student will construct a graph and interpret or draw a conclusion from the graph. This will enlighten learners as to how scientists arrive at conclusions empowering the students with the understanding of the scientific process.

4) To develop student's ability to quantify data through the performance of a laboratory exercise and to analyze the data to produce meaningful physics relationships.

EUSLO 1 *Informed Learners* and EUSLO 2 *Empowered Learners*

Rationale: Quantification is a critical part of every laboratory course. The ability to make connections between various data is a key element in science. Students will be asked to take the data they have gathered and refute or confirm a hypothesis based upon the data they have gathered. This will empower them with the ability to understand how science works in the in the world.

III. COURSE OUTLINE

1) Measurement (1 hours)
   a) Numbers and units
   b) Systems of measurement
      i) English
      ii) Metric
   c) Vectors and Scalars
2) Motion (9 hours)
   a) Fundamental Concepts
      i) Acceleration, velocity and displacement
      ii) Describing motion
      iii) Graphical techniques
      iv) Use of formulas
      v) Kinematics - the how of motion
      vi) Uniformly accelerated Motion
      vii) Air resistance and motion
   b) Dynamics - the why of motion
      i) Newton and his laws
         (1) Inertia
         (2) Impulse and momentum
         (3) Action and Reaction
   c) Motion about an axis
   d) Curvilinear motion versus linear motion
   e) Gravitation and Motion

f) The universal force
g) Kepler's Laws of planetary motion

3) Energy (8 hours)
   a) Types
      i) Kinetic
      ii) Potential
   b) Conservation of energy
   c) Collisions and other things, such as momentum and angular momentum
   d) Energy Transfer
      i) Work
      ii) Heat
   e) Applications

4) Waves (8 hours)
   a) Sound
   b) Echoes, the voice and the ear
   c) Resonance
   d) Doppler Effect
   e) Light
   f) Mirrors
   g) Lenses
   h) Color
   i) Rainbows and other phenomena

5) Electricity and Magnetism (5 hours)
   a) Static Electricity
      i) Charged objects
      ii) Forces of attraction and repulsion
      iii) Friction and induction
      iv) Electric Fields
   b) Current Electricity
      i) Circuits
      ii) Amps, volts and ohms
      iii) Fuses and circuit breakers
      iv) Magnetism and Electricity
      v) The interconnection
   c) Magnetic fields and forces
   d) Applications
      i) Motors
      ii) Generators
      iii) Appliances
      iv) Electricity and the Body
      v) Health hazards

6) Modern Physics (3 hours)
   a) Relativity -Einstein
   b) Quantum Theory – Planck
   c) Photon
   d) Dual Nature of Reality- DeBrogli
   e) Wave and/or particle
   f) You can't be too sure- Heisenberg

g) How much can we know

7) The Atom (5 hours)
   a) Its structure
   b) The nucleus
   c) Fission
   d) Fusion
   e) Atomic Energy - Good or Bad?

Three one hour examinations (3 hours)
Final Exam (2 hours)

LAB EXERCISES

Week 1 Introduction to the course and course expectations
Week 2 Time and Distance, Investigations and Experiments, Speed
Week 3 Using a Scientific Model to Predict Speed, Position and Time Acceleration
Week 4 Weight, Gravity, and Friction, Equilibrium, Action, and Reaction
Week 5 Forces in Machines, the Lever, Gears and Design
Week 6 Works, Energy Conservation, Energy Transformations
Week 7 What is a Circuit? Current, Ohm's Law
Week 8 More Electric Circuits, Series Circuits
Week 9 Permanent Magnets, Electromagnets
Week 10 Electric Motors and Generators
Week 11 Harmonic Motion
Week 12 Natural Frequency and Resonance
Week 13 Color, Seeing an image, the Human Eye
Week 14 Laboratory Final exam – held during regularly scheduled lab time

IV. EVALUATION METHODS

The final grade for the course will be determined from 3 one-hour examinations, a two hour final, scheduled quizzes, assigned homework, and weekly laboratory exercises.

The weighting of the above activities will be proscribed as follows:

Laboratory assessments	6%
Laboratory activities	24%
Final exam	20%
Semester tests	30%
Homework or quizzes	20%

V. GRADING SCALE

Score			**Grade**
100 %	to	90%	A
89%	to	80%	B

79%	to	70%	C
69%	to	60%	D
Less than		60%	F

VI. ATTENDANCE POLICY

Students are expected to attend all lectures and complete all labs. Individual faculty members assigned to this course will determine the specific attendance requirements for this course. In certain situations, such as illness, personal emergency or active military duty, students will be excused for missing class if a written excuse or other proof of absence is provided to the instructor. Individual faculty members will determine how the assignments or other work will be made up in the event of an excused absence. The course attendance policy will comply with the University Undergraduate attendance policy.

VII. REQUIRED TEXTBOOKS, SUPPLEMENTAL BOOKS AND READINGS

Readings

On the syllabus distributed during the first day of class there is a requirement that students acquire a science fiction novel specified by the instructor. There will be a selection of questions on the final exam that are based on the assigned novel. Works that are used may include the following:

The Day of the Triffids by John Wyndham
Timescape by Gregory Benford
Rendezvous with Rama by Arthur C Clarke

Text Book Conceptual Physics 11th Edition – Paul Hewitt, Pearson 2010

VIII. SPECIAL RESOURCE REQUIREMENTS

None

IX. BIBLIOGRAPHY

Barnett **The Universe and Dr. Einstein**, Time Inc. New York (1962)

Bohr, **Atomic Theory and The Description of Nature** Cambridge (1934).

Einstein, **The Meaning of Relativity** Oxford Pub (1965).

Feynman, **Surely You're Joking, Mr. Feynman**, Bantam books (1986).

Gamow **Mr. Tompkins**, Cambridge University Press (1967).

Gamow **Thirty Years That Shook Physics**, Double Day, New York (1966).

Gamow, **One, Two, Three... Infinity** Viking Inc. (1961).

Hewitt, Paul G. **Conceptual Physical Science**, Addison Wesley Longman, (2009)

Krauskopf **The Physical Universe**, McGraw-Hill, (1993)

Shipman, James T. **Fundamentals of Physical Science**, D.C. Heath and Co (1992)

Shipman, James T. **An Introduction to Physical Science** D.C. Heath and Co., (1993)

SUMMARY OF CHANGE

The primary objectives, topics and course activities are not being significantly changed. The lab activities over the years have been modified, and this change is reflected in this proposal. The purpose of this course revision is to map the course objectives to the new Liberal Studies Expected Undergraduate Student Learning Objectives (EUSLO)

The method of assigning and evaluating the outside reading is being modified. In the past, students had a selection of novels to read, and took an individualized assessment during the lab class. In the new version of the class, questions regarding the reading will be on the final exam.

Sample assignment from Lab portion of the course

(Please note that SCI 105 and SCI 101 share the same laboratory activities.)

In this Investigation, you will:

1. Use the electronic timer and photogates with a car and ramp.
2. Identify the variables that influence how fast a car travels down a ramp.
3. Learn how to design experiments that provide good scientific results.

Question: How do we ask questions and get answers from nature?

We do experiments to collect evidence that allows us to unravel nature's puzzles. You can think of an experiment as asking a question about the universe: "What would happen if I did this?" If your experiment is well planned, the results of the experiment provide the answer you are looking for. If your experiment is not planned correctly, you will still get results but you may not know what they mean. In this Investigation, you will experiment with speed and the angle of a ramp. Only by paying careful attention to the variables can you make sense of your results.

A Setting up the experiment

The faster you go the shorter the time it takes to reach your destination. With two photogates you can measure time very accurately. Set up the ramp and car as instructed by your teacher. Each group in the class will have a different ramp angle. The angle is determined by which hole in the stand you use to attach the ramp. Put two photogates on the ramp so that you can measure time for the car. Plug the photogate closest to the top of the ramp into input A of the timer and the other photogate into input B.

a. Look around the class and note which hole each group is using for its ramp. With your group, make a prediction as to which group will have the fastest car, and therefore the shortest time from A to B. This prediction is your group's hypothesis. Write down this hypothesis so you can compare it to your results.
b. Roll the car down the ramp and record the time it takes to go from photogate A to photogate B. Be sure you look at the timer reading with the A and B lights on.
c. Compare your results with other groups'. Did the times that everyone measured agree with your hypothesis about how the angle of the ramp would affect the speed? Why or why not?
d. Is there a better way to test whether increasing the ramp angle makes the car go faster? Explain how you would redo this experiment so the results make sense.

B Variables in an experiment

Variables are the factors that affect experimental results. In part 1, each group did the experiment with too many differences, instead of only the angle of the ramp. That made it hard to compare results. In an experiment, you have to keep everything the same and only change one variable at a time. If you only change one thing at a time, when you get a result

you know it was caused by the variable you changed. What variables will affect how fast the car moves down the ramp? List all the variables discussed by your group.

C Doing a controlled experiment

In this part of the Investigation, you will repeat the time measurements of the car, but as you will see, each group will attach the photogates in the same way. This will allow groups to more accurately compare results.

1. In the table, record any variables you think should be controlled to make the experiment a comparison of how cars behave on ramps of different angles. Write values for these variables in the table. These values will not change during the experiment.
2. Develop a good technique for rolling the car down the ramp so you get three times that are within 0.0005 seconds of each other.
3. Using your new technique and setup, record the time it takes the car to travel from photogate A to photogate B. Once you have your new results, compare them with the results of the other groups.

    a. Did your times agree with your hypothesis about how they would change with the angle of the ramp?
    b. In one or two sentences describe why this experiment was better or worse than your first experiment.

Your answer should talk about cause and effect relationships and variables.

D Applying what you learned

a. It is often easy to confuse cause and effect. When we see something happen, we think up a reason for why it happened, but we don't always get the right reason. If you drop a piece of paper and a steel weight at the same time, which one hits the ground first? If the paper is flat, the steel always hits first. Why does the steel hit first? Is it because heavier objects fall faster, or is there another reason? In your answer give at least one other reason why a steel weight might fall faster than a flat sheet of paper.

b. Plan and perform another experiment to test the effect of one of the other variables on the speed of the car. Create a data table and a procedure for controlling the variables you don't want to change.

End of sample lab activity

Scoring Rubric

points (20)	Data (5)	Questions (5)	Analysis (5)	Conclusion (5)
5	Data complete, all values present and reasonable, proper units	All answers complete, alternative answer present if appropriate	All graphs and / or calculations complete, graphs are drawn with all appropriate parts.	Well developed, and correct conclusions
4	Data present, however missing units, all values reasonable	Most all answers complete, alternative answer present if appropriate	Most all graphs and / or calculations complete, graphs are drawn with all appropriate parts.	Correct and succinct conclusion
3	Data present, some values reasonable, missing some units	All answer present, minimally correct	Graph and /or calculations complete, missing on minor points	Conclusions present, correct but underdeveloped
2	Missing some values, some reasonable	Most all answers present, some correct	Most all graphs and calculations present, some incorrect	Conclusion present, somewhat correct
1	Some values present, not reasonable, no units	Some answers present, some correct.	Some graphs present, some correct	Conclusion present, not correct
0	Missing	Missing	Missing	missing

Part II

Liberal Studies Course Approval Checklist
Instruction Sheet

Use this checklist for all Liberal Studies categories other than writing-intensive sections; a different checklist is available for this If you have questions, contact the Liberal Studies Office, 103 Stabley, telephone 357-5715

This checklist is intended to assist you in developing your course to meet IUP's Criteria for Liberal Studies and to arrange your proposal in a standard order for consideration by the Liberal Studies Committee (LSC) and the University-Wide Undergraduate Curriculum Committee (UWUCC) When you have finished, your proposal will have these parts:

_X_ Standard UWUCC Course Proposal Cover Sheet, with signatures and Liberal Studies course designation checked

_X_ Course syllabus in UWUCC format

NA_ UWUCC course analysis questionnaire Needed only if this is a new course not previously approved by the University Senate These are not considered by the LSC but will be forwarded to the UWUCC along with the rest of the proposal after the LSC completes its review

This is not a new course; it has been approved by the University Senate

_X__ Assignment instructions for one of the major course assignments and a grading rubric or grading criteria for that assignment

_X__ Answers to the four questions listed in the Liberal Studies Course Approval General Information (one page)

Old Course Syllabus

I. CATALOG DESCRIPTION

SCI 105 PHYSICAL SCIENCE I 4c-2l-3cr

A descriptive and conceptual course in physics for the non-science major. High school physics is not a prerequisite. Course content is designed to develop an understanding and appreciation of the physical world around us, to produce changes in attitude and background essential for our modern society, and to clarify the following topics: motion, heat, sound, light, electricity, magnetism, and the structure of matter.

II. COURSE OBJECTIVES

1) The students will develop an understanding of the role of physics in describing the phenomena of nature.

2) To provide the necessary experiences in the laboratory so that the processes of observation, classification and generalization may be used

3) To be able to explain in terms of the physical processes involved some of the more common natural phenomena

4) To be able to use mathematics both algebraic and graphical techniques to arrive at numerical answers for scientific problems

5) To inculcate an attitude of appreciation for the importance of science in modern society

6) To furnish a factual background as a foundation for making intelligent judgments concerning the worth of the applications of science

7) Provide an understanding of some of the "great moments" in the history of physics and the individuals, including women and minorities, responsible for them.

III COURSE OUTLINE

8) Measurement (1 hours)
   a) Numbers and units
   b) Systems of measurement
      i) English
      ii) Metric
   c) Vectors and Scalars

9) Motion (9 hours)
   a) Fundamental Concepts
      i) Acceleration, velocity and displacement
      ii) Describing motion
      iii) Graphical techniques
      iv) Use of formulas
      v) Kinematics - the how of motion
      vi) Uniformly accelerated Motion
      vii) Air resistance and motion
   b) Dynamics - the why of motion
      i) Newton and his laws
         (1) Inertia
         (2) Impulse and momentum
         (3) Action and Reaction
   c) Motion about an axis
   d) Curvilinear motion versus linear motion
   e) Gravitation and Motion
   f) The universal force
   g) Kepler's Laws of planetary motion
10) Energy (8 hours)
   a) Types
      i) Kinetic
      ii) Potential
   b) Conservation of energy
   c) Collisions and other things, such as momentum and angular momentum
   d) Energy Transfer
      i) Work
      ii) Heat
   e) Applications
11) Waves (8 hours)
   a) Sound
   b) Echoes, the voice and the ear
   c) Resonance
   d) Doppler Effect
   e) Light
   f) Mirrors
   g) Lenses
   h) Color
   i) Rainbows and other phenomena
12) Electricity and Magnetism (5 hours)
   a) Static Electricity
      i) Charged objects
      ii) Forces of attraction and repulsion
      iii) Friction and induction
      iv) Electric Fields
   b) Current Electricity
      i) Circuits

ii) Amps, volts and ohms
iii) Fuses and circuit breakers
iv) Magnetism and Electricity
v) The interconnection

c) Magnetic fields and forces
d) Applications
i) Motors
ii) Generators
iii) Appliances
iv) Electricity and the Body
v) Health hazards

13) Modern Physics (3 hours)
a) Relativity -Einstein
b) Quantum Theory – Planck
c) Photon
d) Dual Nature of Reality- DeBrogli
e) Wave and/or particle
f) You can't be too sure- Heisenberg
g) How much can we know

14) The Atom (5 hours)
a) Its structure
b) The nucleus
c) Fission
d) Fusion
e) Atomic Energy - Good or Bad?

Three one hour examinations (3 hours)

IV EVALUATION METHODS

The final grade for the course will be determined from 3 one-hour examinations, a two hour final, scheduled quizzes, assigned homework, and weekly laboratory exercises

V. GRADING SCALE

The weighting of the above activities will be proscribed as follows:

Laboratory activities	30%
Final exam	20%
Semester exams	30%
Homework or quizzes	20%

Grading Scale: A: ≥ 90% B: 80-89% C: 70-79% D: 60-69% F: <60%

VI. ATTENDANCE POLICY

Students are expected to attend all lectures and complete all labs. Individual faculty members assigned to this course will determine the specific attendance requirements for this course. In certain situations, such as illness, personal emergency or active military duty, students will be excused for missing class if a written excuse or other proof of absence is provided to the instructor. Individual faculty members will determine how the assignments or other work will be made up in the event of an excused absence.

VII. REQUIRED TEXTBOOKS, SUPPLEMENTAL BOOKS AND READINGS

Readings

On the syllabus distributed during the first day of class there is a requirement that students acquire a science fiction novel specified by the instructor. There will be a selection of questions on the final exam that are based on the assigned novel. Works that are used may include the following:

The Day of the Triffids by John Wyndham
Timescape by Gregory Benford
Rendezvous with Rama by Arthur C Clarke

Text Book Conceptual Physics 11th Edition – Paul Hewitt, Pearson 2010

SYLLABUS ADDENDUM

PHYSICAL SCIENCE I - LABORATORY

LAB OBJECTIVES

1) To allow the student to experience the concepts presented in lecture

2) To allow the student to become familiar with the systems of measurement and the instruments associated with those systems

3) To allow the student to become familiar with various analytical techniques, including graphing and graphical analysis of the data

4) To allow the student to overcome the reluctance to manipulate simple apparatus in exploring phenomena

5) To develop student's ability to quantify data through the performance of a laboratory exercise and to analyze the data to produce meaningful physics relationships.

LAB EXERCISES

Week 1 Introduction
Week 2 Time and Distance, Investigations and Experiments, Speed
Week 3 Using a Scientific Model to Predict Speed, Position and Time Acceleration
Week 4 Weight, Gravity, and Friction, Equilibrium, Action, and Reaction
Week 5 Forces in Machines, the Lever, Gears and Design
Week 6 Works, Energy Conservation, Energy Transformations
Week 7 What is a Circuit? Current, Ohm's Law
Week 8 More Electric Circuits, Series Circuits
Week 9 Permanent Magnets, Electromagnets
Week 10 Electric Motors and Generators
Week 11 Harmonic Motion
Week 12 Natural Frequency and Resonance
Week 13 Color, Seeing an image, the Human Eye
Week 14 Laboratory Final exam – held during regularly scheduled lab time

VIII Special resource requirements

None

Submit the original of the completed proposal to the Liberal Studies Office (103 Stabley) In addition to the signed hard copy, email the proposal as a Word or RTF file attachment to Liberal-Studies@iupedu

Please Number All Pages

Liberal Studies Course Approval General Information
On a separate sheet of paper, please answer these questions
(Do not include this sheet or copies of the questions in your proposal; submit only the answers)

1) During the progression of the semester, lecture instructors meet formally as well as informally to discuss topics covered during the week. Teaching strategies, topics covered and anecdotal student information is shared between teachers. This tends to be a high enrollment course. To be fair to all students; our faculty appreciates the need to be consistent between sections. Secondly, all students in the course take the same laboratory course. The laboratory investigations are the same for all sections of the course; the lab activities are organized by a departmental committee. Common content in the lab course drives the content in the lecture sections. For example, in the sixth week, the laboratory investigation is on electricity; therefore, the lecture is typically covering the area of electricity during the fifth or sixth week.

2) This class investigates mathematical descriptions of the physical world. While this topic is not an emphasis of the course, ethnic and racial minorities as well as women are discussed when appropriate. For example in the history of the development nuclear fission, Lise Meitner was the female scientist who initially developed the fission reaction. Although she did the research, the results were published under the name of her colleague, Otto Hann. Women did not publish many chemistry and physics papers in the 1930's.

3) Reading one science fiction novel is required. This is stated in the syllabus.

4) The breadth of SCI 105 is much broader than PHYS 131. In the introductory major's course, great care is taken to develop the mathematical skills necessary for Physics PHYS 131 goes into the depth of physics problems solving and quantitative analysis. This course is much less mathematical and covers a much broader selection of topics.

Part III letters of support

Not necessary - We are only mapping the course objectives to the new Liberal Studies objectives; the course objectives themselves are not changing. It is common knowledge these changes are in effect University wide.

Part III letters of support

Not necessary - We are only mapping the course objectives to the new Liberal Studies objectives; the course objectives themselves are not changing. It is common knowledge this is happening University wide.