EXHIBIT B

EXHIBIT B

OCEAN COUNTY COLLEGE

BOARD OF TRUSTEES

Bylaw, Policy, and Curriculum Committee Agenda Items

To: Board of Trustees

From: Office of the President

Date: August 28, 2025

The following Bylaw, Policy, and Curriculum Committee items are recommended to the Ocean County College Board of Trustees for approval at its meeting on **Thursday, September 4, 2025**:

1. Recommend approval of the following Ocean County College academic calendars:

    a. 2025-2026 Revised Academic Calendar **(Exhibit B-1)**
    b. 2026-2027 Academic Calendar **(Exhibit B-2)**

2. Recommend approval of the following items as accepted by the College Senate at its meeting on August 21, 2025:

    a. New Courses

        a. BIOL 119L, Science and the Human Body Lab **(Exhibit B-3)**
        b. PHYS 283L, General Physics III Lab **(Exhibit B-4)**

    b. Revised Courses with Name Change

        a. BIOL 119, Science and the Human Body to Science and the Human Body Lecture **(Exhibit B-5)**
        b. PHYS 283, General Physics III to General Physics III Lecture **(Exhibit B-6)**

EXHIBIT B-1

EXHIBIT B-1

2025/2026 Academic Calendar

~~Fall Semester 2025~~ 2025 Fall Fifteen-Week	
Wednesday, September 3	Classes Begin
Wednesday, November 26 - Friday, November 28	No Classes
Friday, December 19	Last Day of Classes
~~2025 Accelerated Term 5~~ 2025 Fall First Seven-Week	
Wednesday, September 3	First Day of Classes
Thursday, October 23	Last Day of Classes
~~Fall 2025 Quick Term~~ 2025 Fall Ten-Week	
Wednesday, October 8	Classes Begin
Wednesday, November 26 - Friday, November 28	No Classes
Friday, December 19	Last Day of Classes
~~2025 Accelerated Term 6~~ 2025 Fall Second Seven-Week	
Wednesday, October 27	First Day of Classes
Wednesday, November 26 - Friday, November 28	No Classes
Friday, December 19	Last Day of Classes
~~Winter Intersession 2025~~ 2025 Winter Five-Week	
Monday, December 15	Classes Begin
Wednesday, December 24- Thursday, December 25	No Classes
Thursday, January 1	No Classes
Sunday, January 18	Last Day of Classes
~~Spring Semester 2026~~ 2026 Spring Fifteen-Week	
Wednesday, January 21	Classes Begin
Monday, February 16	No Classes
Monday, March 16- Sunday, March 22	No Classes - Spring Break
Wednesday, May 13	Last Day of Classes (MONDAY SCHEDULE)
~~Wednesday~~Thursday, May ~~20~~21	Commencement
~~2026 Accelerated Term 1~~ 2026 Spring First Seven-Week	
Wednesday, January 21	First Day of Classes
Monday, February 16	No Classes
Friday, March 13	Last Day of Classes
~~Spring 2026 Quick Term~~ 2026 Spring Ten-Week	
Wednesday, February 25	Classes Begin
Monday, March 16- Sunday, March 22	No Classes - Spring Break
Wednesday, May 13	Last Day of Classes (MONDAY SCHEDULE)
~~2026 Accelerated Term 2~~ 2026 Spring Second Seven-Week	
Monday, March 23	First Day of Classes
Wednesday, May 13	Last Day of Classes

Revised 8.18.2025

EXHIBIT B-1

2025/2026 Academic Calendar

~~Summer 2026 Ten-Week~~ 2026 Summer Ten-Week

Monday, May 18	Classes Begin
~~Wednesday~~Thursday, May ~~20~~21	No Classes - Commencement
Monday, May 25	No Classes
Friday, June 19	No Classes
Friday, July 3	No Classes
Tuesday, July 28	Last Day of Classes

~~Summer 2026 First Five-Week~~ 2026 Summer First Five-Week

Monday, May 18	Classes Begin
~~Wednesday~~Thursday, May ~~20~~21	No Classes - Commencement
Monday, May 25	No Classes
Friday, June 19	No Classes
Tuesday, June 23	Last Day of Classes

~~2026 Accelerated Term 3~~ 2026 Summer First Seven-Week

Monday, May 18	First Day of Classes
~~Wednesday~~Thursday, May ~~20~~21	No Classes - Commencement
Monday, May 25	No Classes
Friday, June 19	No Classes
Friday, July 3	No Classes
Thursday, July 9	Last Day of Classes

~~Summer 2026 Second Five-Week~~ 2026 Summer Second Five-Week

Wednesday, June 24	Classes Begin
Friday, July 3	No Classes
Tuesday, July 28	Last Day of Classes

~~2026 Accelerated Term 4~~ 2026 Summer Second Seven-Week

~~Friday~~Monday, July ~~10~~13	First Day of Classes
~~Thursday, August 27~~	~~No Classes~~
~~Saturday~~Sunday, August ~~29~~30	Last Day of Classes

~~Summer 2026 Post Session (Four-Day Week)~~

~~Monday, August 3~~	~~First Day of Classes~~
~~Wednesday, August 26~~	~~Last Day of Classes~~

EXHIBIT B-2

EXHIBIT B-2

2026/ 2027 Academic Calendar

2026 Fall Fifteen-Week

Wednesday, September 9	Classes Begin
Wednesday, November 25 - Friday, November 27	No Classes
Wednesday, December 23	Last Day of Classes

2026 Fall First Seven-Week

Wednesday, September 9	First Day of Classes
Tuesday, October 27	Last Day of Classes

2026 Fall Ten-Week

Wednesday, October 7	Classes Begin
Wednesday, November 25 - Friday, November 27	No Classes
Wednesday, December 23	Last Day of Classes

2026 Fall Second Seven-Week

Wednesday, October 28	First Day of Classes
Wednesday, November 25 - Friday, November 27	No Classes
Wednesday, December 23	Last Day of Classes

2026 Winter Five-Week

Monday, December 14	Classes Begin
Thursday, December 24- Friday, December 25	No Classes
Friday, January 1	No Classes
Sunday, January 17	Last Day of Classes

2027 Spring Fifteen-Week

Wednesday, January 20	Classes Begin
Monday, February 15	No Classes
Monday, March 15- Sunday, March 21	No Classes - Spring Break
Wednesday, May 12	Last Day of Classes (MONDAY SCHEDULE)

2027 Spring First Seven-Week

Wednesday, January 20	First Day of Classes
Monday, February 15	No Classes
Friday, March 12	Last Day of Classes

2027 Spring Ten-Week

Wednesday, February 24	Classes Begin
Monday, March 15 - Sunday, March 21	No Classes - Spring Break
Wednesday, May 12	Last Day of Classes (MONDAY SCHEDULE)

2027 Spring Second Seven-Week

Monday, March 22	First Day of Classes
Wednesday, May 12	Last Day of Classes

6/30/2025 J. Emma
8/15/2025 C.P. Brittain

EXHIBIT B-2

2026/ 2027 Academic Calendar

2027 Summer Ten-Week

Monday, May 17	Classes Begin
Thursday, May 20	No Classes - Commencement
Monday, May 31	No Classes
Friday, June 18	No Classes
Friday, July 2	No Classes
Tuesday, July 27	Last Day of Classes

2027 Summer First Five-Week

Monday, May 17	Classes Begin
Thursday, May 20	No Classes - Commencement
Monday, May 31	No Classes
Friday, June 18	No Classes
Tuesday, June 22	Last Day of Classes

2027 Summer First Seven-Week

Monday, May 17	First Day of Classes
Thursday, May 20	No Classes - Commencement
Monday, May 31	No Classes
Friday, June 18	No Classes
Friday, July 2	No Classes
Thursday, July 8	Last Day of Classes

2027 Summer Second Five-Week

Wednesday, June 23	Classes Begin
Friday, July 2	No Classes
Tuesday, July 27	Last Day of Classes

2027 Summer Second Seven-Week

Monday, July 12	First Day of Classes
Sunday, August 29	Last Day of Classes

6/30/2025 J. Emma
8/15/2025 C.P. Brittain

EXHIBIT B-3

Course Change Request

New Course Proposal

Date Submitted: 07/22/25 10:13 am

Viewing: BIOL 119L : Science and the Human Body Lab

Last edit: 07/25/25 9:50 am

Changes proposed by: James Marshall (jmarshall)

Learning Outcomes

Display (show only)

In Workflow

1. **STEM Academic Administrator**
2. **STEM Dean**
3. **Executive Director of Curriculum and Program Development**
4. **Curriculum Committee Chair**
5. **Senate Chair**
6. Vice President of Academic Affairs
7. Cabinet
8. President
9. Board of Trustees Chair
10. STEM Academic Administrator
11. Colleague

Approval Path

1. 07/22/25 10:55 am Connor Sampson (csampson): Approved for STEM Academic Administrator
2. 07/23/25 9:55 am Vandana Saini (vsaini): Rollback to STEM Academic Administrator for STEM Dean
3. 07/23/25 9:59 am Connor Sampson

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(csampson): Approved for STEM Academic Administrator
4. 07/23/25 10:00 am Vandana Saini (vsaini): Approved for STEM Dean
5. 07/25/25 9:50 am James Marshall (jmarshall): Approved for Executive Director of Curriculum and Program Development
6. 08/15/25 9:22 am Caroline Brittain (cbrittain): Approved for Curriculum Committee Chair

1. Course Information

Subject	BIOL - Biology
School	Science, Technology, Engineering, Mathematics
Course Title	Science and the Human Body Lab

2. Hours

Semester Hours	1.00
Lecture	0.00
Lab	2.00
Practicum	0.00

3. Catalog Description

For display in the online catalog

This Laboratory course studies terminology associated with the study of human body, the chemical, cellular, and tissue level of organization, cellular and sexual reproduction as well as the skeletal system. Laboratory instrumentation and models reinforce all lecture material. This lab does not do dissections.

4. Requisites

Prerequisites

None

Corequisites

For the first attempt BIOL 119 is considered a corequisite. If the student should fail either lecture or lab after the first attempt then they may take the individual failed section.

5. Course Type

Course Type for Perkins Reporting	non-vocational (not approved for Perkins funding)

6. Justification

Describe the need for this course

This is the Lab component to BIOL 119.

7. General Education

Will the college submit this course to the statewide General Education Coordinating Committee for approval as a course, which satisfies a general education requirement?

Yes

General Education Category

Lab Science

General Education Status	Proposed

8. Consistency with the Vision and Mission Statements, the Academic Master Plan, and the strategic initiatives of the College

Please describe how this course is consistent with Ocean County College's current Vision Statement, Mission Statement, Academic Master Plan, and the strategic initiatives of the College:

	Add item
1	Demonstrating the college's commitment to offer comprehensive educational programs that develop intentional learners of all ages. (Mission Statement)
2	Seeking to ensure that students will thrive in an increasingly diverse and complex world (Vision Statement).
3	Preparing students for successful transfer to other educational institutions and/or for entrance into the workforce. (Academic Master Plan).
4	Seeking to empower students through the mastery of intellectual and practical skills. (Academic Master Plan).
5	Challenging students to transfer information into knowledge and knowledge into action. (Academic Master Plan).

9. Related Courses at Other Institutions

Comparable Courses at NJ Community Colleges

Institution	Rowan College at Burlington County
Course Title	Basic Biology & Human Affairs - Lab
Course Number	BIO-121
Number of Credits	1
Comments	

Transferability of Course

Georgian Court University

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
BI111 Life: Human Biology 4-credits	Natural Science (linked course must complete both lecture & lab or only elective credit is granted)	

Kean University

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
BIOX1001 Biology Lab Science 1-credits	Lab Science General Education (linked course must complete both lecture & lab or only elective credit is granted)	

Monmouth University

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
BY104 Human Biology 4-credits	Natural Science (linked course must complete both lecture & lab or only elective credit is granted)	

Rowan University

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
BIOL 01113 Gen Bio – Human Focus 4-credits	Major (linked course must complete both lecture & lab or BIOL 01110 Human Biology 3-credits is granted)	

Rutgers - New Brunswick, Mason Gross School of the Arts

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
01119EC Biological Sciences/Biology Elective 4-credit	Major Elective (linked course must complete both lecture & lab or only elective credit is granted)	

Stockton University

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
BIOL 0103 4-credits	Human Biology Major (linked course must complete both lecture & lab or only elective credit is granted)	

If not transferable to any institution, explain:

10. Course Learning Outcomes

Learning Outcomes

	Students who successfully complete this course will be able to:
CLO1	Discuss normal human structures.
CLO2	Describe the functions and physiology of organ systems.
CLO3	Discuss the interaction of the systems of the human body
CLO4	Describe cellular reproduction.
CLO5	Discuss general concepts of genetics.
CLO6	Describe DNA replication and protein synthesis.

11. Topical Outline

(include as many themes/skills as needed)

	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
TO1	Human Biology, Science and Society	1.1The characteristics of life 1.2 How humans fit into the natural world 1.2a- Living things are grouped according to their characteristics 1.2b- The defining features	Exams/Notebook/Lab	All

	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
		of humans 1.2c- Human biology can be studied on any level of biological organization		
TO2	Science is both a Body of Knowledge and a Process	2.1The scientific method is a process for testing ideas 2.2 Making the findings known 2.3 A well-tested hypothesis becomes a theory 2.4 Sources of scientific information vary in style and quality 2.5 Learning to be a critical thinker 2.5a-Become a skeptic 2.5b- Appreciate the value of statistics 2.5c- Learn how to read graphs 2.5d- Distinguish anecdotes form scientific evidence 2.5e- Separate facts from conclusions 2.5f- Understand the differences between correlation and causation	Exams/Notebook/Lab	All
TO3	Chemistry of Living Things	3.1-All matter consists of elements 3.2- Atoms combine to form molecules 3.3-Life depends on water 3.4- The importance of hydrogen ions	Exams/Notebook/Lab	All

	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
		3.5- The organic molecules of living organisms		
TO4	Structure and Function of Cells	4.1-Cells are classified according to their internal organization 4.2- Cell structure reflects cell function 4.3- A plasma membrane surrounds the cell 4.4- Molecules cross the plasma membrane in several ways 4.5- Internal structures carry out specific functions 4.6- Cells have structures for support and movement 4.7- cells use and transform matter and energy	Exams/Notebook/Lab	All
TO5	Cell Reproduction and Differentiation	5.1- The cell cycle creates new cells 5.2- Replication, transcription and translation – an overview 5.3- Cell reproduction is regulated 5.4-Environmental factors influence cell differentiation	Exams/Notebook/Lab	All
TO6	From Cells to Organ Systems	6.1-Tissues are groups of cells with a common function 6.2- Epithelial tissues cover body cavities and surfaces 6.3- Connective tissue	Exams/Notebook/Lab	All

	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
		supports and connects body parts 6.4-Muscle tissues contract to produce movement 6.5 Nervous tissue transmits impulses 6.6- Organ and organ systems perform complex functions 6.7- The skin as an organ system 6.8- Multicellular organisms must maintain homeostasis		
TO7	Human Systems	7.1The skeletal system 7.2- The muscular system 7.3- Blood 7.4- Heart and blood vessels 7.5- The immune system and mechanisms of defense 7.6- The respiratory system: exchange of gases 7.7- The nervous system – integration and control 7.8- The endocrine system	Exams/Notebook/Lab	All
TO8	Cancer	8.1- Tumors can be benign or cancerous 8.2- Cancerous cells lose control over cell functions 8.3- How cancer develops 8.4- Advances in diagnosis enable early detection 8.5- Cancer treatments 8.6- The ten most common	Exams/Notebook/Lab	All

	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
		cancers 8.7- Most cancers can be prevented		
TO9	Genetics and Inheritance	9.1- Alleles are different forms of homologous genes 9.2- Genetic inheritance follows certain patterns 9.3- Sex-linked inheritance: X and Y chromosomes carry different genes 9.4- Chromosomes may be altered in number of structure 9.5- Inherited genetic disorders usually involve recessive alleles 9.6- Genes code for proteins, not for specific behaviors 9.7- DNA can be modified in the laboratory Exams/ Notebook /Lab all	Exams/Notebook/Lab	All
TO10	Development	10.1- Fertilization occurs when sperm and egg unite 10.2- Development: cleavage, morphogenesis, differentiation, and growth 10.3- Pre-embryonic	Exams/Notebook/Lab	All

12. Methods of Instruction

In the structuring of this course, what major methods of

instruction will be utilized?

Laboratory

13. General Education Goals Addressed by this Course (this section is to fulfill state requirements)

Information

Communication-Written and Oral Yes

Related Course Learning Outcome All

Related Outline Component All

Assessment of General Education Goal (Recommended but not limited to)

Laboratory Exercises/Homeworks/Class Discussions

Quantitative Knowledge and Skills

Scientific Knowledge and Reasoning Yes

Related Course Learning Outcome All

Related Outline Component All

Assessment of General Education Goal (Recommended but not limited to)

Laboratory Exerices/Homework

Technological Competency

Information Literacy

Society and Human Behavior

EXHIBIT B-3

Humanistic Perspective

_____

Historical Perspective

_____

Global and Cultural Awareness

_____

Ethical Reasoning and Action

_____

Independent/Critical Thinking	Yes
Related Course Learning Outcome	All
Related Outline Component	All

Assessment of General Education Goal (Recommended but not limited to)

Laboratory Practical

14. Needs

Instructional Materials (text etc.):

An appropriate Laboratory Manual will be selected. Please contact the Department Office for current adoptions.

Technology Needs:

Computers with internet capability, DVD and/or VCR, overhead projectors, microscopes and video projection capabilities. Web-based Materials.

Human Resource Needs (Presently Employed vs. New Faculty):

Presently employed and Adjunct Faculty.

Facility Needs:

Laboratory setting and appropriate laboratory materials

Library needs:

EXHIBIT B-3

NA

15. Grade Determinants

The final grade in the course will be the cumulative grade based on the following letter grades or their numerical equivalents for the course assignments and examinations

A: Excellent

B+: Very Good

B: Good

C+: Above Average

C: Average

D: Below Average

F: Failure

I: Incomplete

R: Audit

For more detailed information on the Ocean County College grading system, please see Policy #5154.

Reviewer Comments

Vandana Saini (vsaini) (07/23/25 9:55 am): Rollback: Title needs to match the lecture

Key: 2384

EXHIBIT B-4

EXHIBIT B-4

Course Change Request

New Course Proposal

Date Submitted: 07/10/25 4:02 pm

Viewing: PHYS 283L : General Physics III Lab

Last edit: 07/10/25 4:02 pm

Changes proposed by: James Marshall (jmarshall)

Learning Outcomes
Display (show only)

In Workflow

1. **STEM Academic Administrator**
2. **STEM Dean**
3. **Executive Director of Curriculum and Program Development**
4. **Curriculum Committee Chair**
5. **Senate Chair**
6. Vice President of Academic Affairs
7. Cabinet
8. President
9. Board of Trustees Chair
10. STEM Academic Administrator
11. Colleague

Approval Path

1. 07/10/25 4:03 pm Connor Sampson (csampson): Approved for STEM Academic Administrator
2. 07/10/25 4:04 pm Vandana Saini (vsaini): Approved for STEM Dean
3. 07/11/25 7:19 am James Marshall (jmarshall): Approved for

EXHIBIT B-4

Executive Director of Curriculum and Program Development

4. 08/15/25 9:22 am Caroline Brittain (cbrittain): Approved for Curriculum Committee Chair

1. Course Information

Subject	PHYS - Physics and Astronomy
School	Science, Technology, Engineering, Mathematics
Course Title	General Physics III Lab

2. Hours

Semester Hours	1
Lecture	0
Lab	3
Practicum	0

3. Catalog Description

For display in the online catalog

This laboratory course complements the Modern Physics lecture by providing hands-on experience with experiments that illustrate key concepts in modern physics. Students will engage in experiments related to the photoelectric effect, atomic spectra, and quantum mechanics. The experiments will incorporate simulation software and data analysis tools alongside traditional laboratory instruments to facilitate comprehensive data collection and interpretation. The lab emphasizes the development of experimental techniques, data interpretation, and scientific reporting. Through these activities, students will gain practical insights into the empirical foundations of modern physics and enhance their understanding of theoretical principles discussed in the lecture course.

4. Requisites

Prerequisites

MATH-266

Corequisites

MATH-267

For the first attempt PHYS 283 is considered a corequisite. If the student should fail either lecture or lab after the first attempt, then they may take the individual failed section

5. Course Type

Course Type for Perkins Reporting	non-vocational (not approved for Perkins funding)

6. Justification

Describe the need for this course

This course will contribute to the fulfillment of the Lab Science general education requirement for graduation and transfer. It is highly recommended for all students planning to major in engineering and physical science and also recommended as an elective for pre-med and computer science.

7. General Education

Will the college submit this course to the statewide General Education Coordinating Committee for approval as a course, which satisfies a general education requirement?

Yes

General Education Category

Lab Science

General Education Status	Proposed

8. Consistency with the Vision and Mission Statements, the Academic

EXHIBIT B-4

Master Plan, and the strategic initiatives of the College

Please describe how this course is consistent with Ocean County College's current Vision Statement, Mission Statement, Academic Master Plan, and the strategic initiatives of the College:

	Add item
1	Demonstrating the college's commitment to offer comprehensive educational programs that develop intentional learners of all ages. (Mission Statement)
2	Seeking to ensure that students will thrive in an increasingly diverse and complex world. (Vision Statement)
3	Preparing students for successful transfer to other educational institutions and/or for entrance into the workforce. (Academic Master Plan)
4	Seeking to empower students through the mastery of intellectual and practical skills. (Academic Master Plan)
5	Challenging students to transfer information into knowledge and knowledge into action. (Academic Master Plan)

9. Related Courses at Other Institutions

Comparable Courses at NJ Community Colleges

Institution None

Course Title Rutgers University – Experimental Modern Physics

Course Number 01:750:387

Number of Credits 3

Comments

This is the closest match, but OCC courses may not capture the full breadth of this course.

Transferability of Course

Georgian Court
University

Kean University

Monmouth University

Rowan University

Rutgers - New Brunswick, Mason Gross School of the Arts

Stockton University

If not transferable to any institution, explain:

10. Course Learning Outcomes

Learning Outcomes

	Students who successfully complete this course will be able to:
CLO1	Use dimensional analysis to perform unit conversions, vet the validity of mathematical expressions representing physical quantities, and to surmise dimensions of unknown quantities.
CLO2	Parse pertinent information of physical systems/scenarios and form mathematical descriptions and constraints (including the use of differential and integral calculus) to address applications
CLO3	Analyze conceptually, graphically, and quantitatively (including the use of differential and integral calculus) and address questions and solve for quantities using modeling and problem solving methods for a given application falling under the following topics: o Special Relativity o Failures of Classical Physics and Old Quantum Theory o Current and Electrical Circuits o Wave Particle Duality and Matter Waves o Quantum Mechanics o Atomic Physics o Nuclear Physics o Particle Physics and Cosmology

	Students who successfully complete this course will be able to:
CLO4	Estimate uncertainties in measured quantities and calculate the propagated uncertainty in calculated quantities and evaluate the strength of experimental conclusions by comparing uncertainty and error.
CLO5	Distinguish between accuracy and precision and determine the limiting factors on experimental results based on measurement resolution, experimental design, etc.
CLO6	Perform experiments carefully and methodically to reduce uncertainties and exercising practical reasoning to obtain high quality data.
CLO7	Interpret graphical data and use it to draw conclusions and infer physical principles.

11. Topical Outline

(include as many themes/skills as needed)

	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
TO1	Hydrogen Atom (Bohr Model) a. Define spectra and spectral lines and distinguish between emission and absorption spectra b. Study the hydrogen spectra and quantitatively describe it via the Rydberg formula c. Describe, compare, and contrast the Thompson, Rutherford, and Bohr models for the hydrogen atom d. Use the Bohr model to describe the characteristics of stationary states of electrons, including their radii, energy levels, and	Laboratory Exercise	Laboratory Exercise/Lab Report	CLO: 1 - 7

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	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
	frequency of emitted photons between transitions e. Discuss the correspondence principle			
TO2	Blackbody Radiation a. Define black bodies and blackbody radiation and quantitatively describe it via Stefan's and Wien's laws. b. Discuss the Raleigh-Jeans limit, Wein's exponential law, and the failure of these to adequately describe observed spectra c. Compute the spectral energy density (Planck's law) via Planck statistics, using quantization, and show the agreement with observations	Laboratory Exercise	Laboratory Exercise/Lab Report	CLO: 1 - 7
TO3	Photoelectric Effect a. Describe the photoelectric effect and its counterintuitive aspects with regards to expectations from classical physics b. Relate the energy of ejected electrons to the frequency or wavelength of incident light and characteristics of the metal	Laboratory Exercise	Laboratory Exercise/Lab Report	CLO: 1 - 7

	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
TO4	Atomic Physics, Nuclear, Particle Physics, and Cosmology a. Describe the quantum mechanical model for the hydrogen atom b. Motivate the solutions to the Schrödinger equation for a spherical potential c. Characterize the solutions based on quantum numbers and discuss physical correspondence d. Relate the properties of the solutions for hydrogen to general properties inferred from the periodic table e. Describe nuclides and properties of nuclei f. Describe radioactivity, quantify nuclear decay, and introduce decay processes g. Introduce the four fundamental forces and describe them in terms of particle interactions h. Classify particles according to mass and structure, distinguish between leptons, hadrons, and gauge bosons i. Discuss the symmetries and conservations laws regarding particle	Laboratory Exercise	Laboratory Exercise/Lab Report	CLO: 1 - 7

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	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
	properties j. Discuss the implications of particle physics on cosmology and introduce current topics in both fields			

12. Methods of Instruction

In the structuring of this course, what major methods of instruction will be utilized?

Demonstrations/Videos/Labs

13. General Education Goals Addressed by this Course (this section is to fulfill state requirements)

Information

Communication-Written and Oral

Quantitative Knowledge and Skills Yes

Related Course Learning Outcome CLO: all

Related Outline Component TO: all

Assessment of General Education Goal (Recommended but not limited to)

Lab Reports

Scientific Knowledge and Reasoning Yes

EXHIBIT B-4

Related Course Learning Outcome CLO: all

Related Outline Component TO: all

Assessment of General Education Goal (Recommended but not limited to)

Lab Reports

Technological Competency Yes

Related Course Learning Outcome CLO: all

Related Outline Component TO: all

Assessment of General Education Goal (Recommended but not limited to)

Lab Reports

Information Literacy Yes

Related Course Learning Outcome CLO: all

Related Outline Component TO: all

Assessment of General Education Goal (Recommended but not limited to)

Lab Reports

Society and Human Behavior

Humanistic Perspective

Historical Perspective

Global and Cultural Awareness

Ethical Reasoning and Action

Independent/Critical Thinking	Yes
Related Course Learning Outcome	CLO: all
Related Outline Component	TO: all

Assessment of General Education Goal (Recommended but not limited to)

Lab Reports

14. Needs

Instructional Materials (text etc.):

Textbook, handouts, laboratory exercises, calculator with trigonometric functions.

Technology Needs:

Instruments, software, computers

Human Resource Needs (Presently Employed vs. New Faculty):

NA

Facility Needs:

NA

Library needs:

NA

15. Grade Determinants

The final grade in the course will be the cumulative grade based on the following letter grades or their numerical equivalents for the course assignments and examinations

A: Excellent

EXHIBIT B-4

B+: Very Good

B: Good

C+: Above Average

C: Average

D: Below Average

F: Failure

I: Incomplete

R: Audit

For more detailed information on the Ocean County College grading system, please see Policy #5154.

Reviewer Comments

Key: 2372

EXHIBIT B-5

Course Change Request

Date Submitted: 07/22/25 10:21 am

Viewing: BIOL 119 : Science and the Human Body Lecture

Last approved: 01/27/21 4:00 am

Last edit: 07/25/25 9:47 am

Changes proposed by: James Marshall (jmarshall)

Catalog Pages referencing this course	Approved General Education Courses Biology (BIOL)
Programs referencing this course	CT.EXER: Exercise Science, Certificate of Proficiency AS.SW: Social Work, Associate in Science CC.HHAW: Holistic Health & Wellness, Certificate of Completion AAS.HS: Health Science AS.SW.MEDI: Social Work, Associate in Science - Option in Medical and Behavioral Health
Other Courses referencing this course	In The Catalog Description: BIOL 130 : Human Anatomy and Physiology I Lecture XBIOL 130 : Xuman Anatomy and Physiology I Lecture Human Anatomy and Physiology I

Learning Outcomes Display (show only)

1. Course Information

Subject	BIOL - Biology
School	Science, Technology, Engineering, Mathematics
Course Title	Science and the Human Body Lecture

2. Hours

Semester Hours	3.00 ~~4.00000~~	
	Lecture	3.00
	Lab	0.00 ~~2.00~~
	Practicum	0.00

3. Catalog Description

For display in the online catalog	A one semester laboratory course for non-science majors or prospective health science students focuses on the nature of Science as a field of inquiry. Emphasis is on the scientific method as a natural outcome of human curiosity. The human body acts as a vehicle to explore the unity of life. Critical thinking is stressed as preparation to fully enjoy a society shaped largely by science and technology. Current trends and/or news articles are incorporated for their topics and exploration of methods used to obtain conclusions.

4. Requisites

Prerequisites	None
Corequisites	For the first attempt BIOL 119L is considered a corequisite. If the student should fail either lecture or lab after the first attempt then they may take the individual failed section. ~~None~~

5. Course Type

Course Type for Perkins Reporting	non-vocational (not approved for Perkins funding)

6. Justification

Describe the need for this course	This course is recommended for non-science majors.

7. General Education

Will the college submit this course to the statewide General Education Coordinating Committee for approval as a course, which satisfies a general education requirement?

Yes

General Education Category	~~Lab Science~~ Science (Non-Lab)
General Education Status	Approved

8. Consistency with the Vision and Mission Statements, the Academic Master Plan, and the strategic initiative

Please describe how this course is consistent with Ocean County College's current Vision Statement, Mission Statement, Academic Master Plan, and the strategic initiative

	Add item
1	Demonstrating the college's commitment to offer comprehensive educational programs that develop intentional learners of all ages. (Mission Statement) ii. Seeking to ensure that students will thrive in an increasingly diverse and complex world (Vision Statement). iii. Preparing students for successful transfer to other educational institutions and/or for entrance into the workforce. (Academic Master Plan). iv. Seeking to empower students through the mastery of intellectual and practical skills. (Academic Master Plan). v. Challenging students to transfer information into knowledge and knowledge into action. (Academic Master Plan).

9. Related Courses at Other Institutions

Comparable Courses at NJ Community Colleges

Institution	
Course Title	
Course Number	
Number of Credits	
Comments	~~None~~

Institution	Rowan College at Burlington County
Course Title	Basic Biology and Human Affairs
Course Number	BIO 120
Number of Credits	3

Number of Credits 3

Comments

Transferability of Course

Georgian Court University

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
BI111 ~~BI 111,~~ Life: Human Biology 4-credits ~~Human Biology, 4 cr.~~	Natural Science (linked course must complete both lecture & lab or only elective credit is granted) ~~General Education~~	

Kean University

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
BIOX1001 Biology Lab Science 3-credits ~~BIOX 1001, Biology GESM with lab, 4 cr.~~	Lab Science General Education (linked course must complete both lecture & lab or only elective credit is granted) ~~General Education~~	

Monmouth University

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
BY104 Human Biology 4-credits ~~BY 001, 100 Level Biology Elective, 4 cr.~~	Natural Science (linked course must complete both lecture & lab or only elective credit is granted) ~~Elective credit~~	

Rowan University

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
BIOL 01113 Gen Bio – Human Focus 4-credits ~~TRC REC, Elective, 4 cr.~~	Rowan University BIOL 01113 Gen Bio – Human Focus 4-credits Major (linked course must complete both lecture & lab or BIOL 01110 Human Biology 3-credits is granted) ~~Elective Credit~~	

Rutgers - New Brunswick, Mason Gross School of the Arts

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
01119EC Biological Sciences/Biology Elective 4-credits ~~01119 EC, Elective, 4 cr.~~	Major Elective (linked course must complete both lecture & lab or only elective credit is granted) ~~General Education~~	

Stockton University

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
BIOL 0103 4-credits ~~TRC REC, Elective, 4 cr.~~	Human Biology Major (linked course must complete both lecture & lab or only elective credit is granted) ~~Elective Credit~~	

If not transferable to any institution, explain:

10. Course Learning Outcomes

Learning Outcomes

	Students who successfully complete this course will be able to:
CLO1	Discuss normal human structures.
CLO2	Describe the functions and physiology of organ systems.
CLO3	Discuss the interaction of the systems of the human body

CLO3	Discuss the interaction of the systems of the human body
CLO4	Describe cellular reproduction.
CLO5	. Discuss general concepts of genetics.
CLO6	Describe DNA replication and protein synthesis.

11. Topical Outline

(include as many themes/skills as needed)

	Major Themes/ Skills	Assignments (Recommended but not limited to)	
TO1	Human Biology, Science and Society ~~Human Biology, Science and Society~~	1.1The characteristics of life 1.2 ~~1.2~~ How humans fit into the natural world 1.2a- ~~world 1.2a-~~ Living things are grouped according to their characteristics 1.2b- ~~1.2b-~~ The defining features of humans 1.2c- ~~1.2c-~~ Human biology can be studied on any level of biological organization	Exams/I
TO2	Science is both ~~is both~~ a Body of Knowledge ~~of Knowledge~~ and a Process ~~a Process~~	~~2.1The scientific method is a process for testing ideas 2.2 Making the findings known 2.3 A well-tested hypothesis becomes a theory 2.4 Sources of scientific Exams/Projects/Lab8:~~2.1The scientific method is ~~all information vary in style and quality 2.5 Learning to be~~ a process for testing ideas 2.2 Making ~~critical thinker 2.5a-Become a skeptic 2.5b- Appreciate~~ the findings known 2.3 A well-tested hypothesis becomes a theory 2.4 Sources ~~value~~ of scientific information vary in style and quality 2.5 Learning to be a critical thinker 2.5a-Become a skeptic 2.5b- Appreciate ~~statistics 2.5c- Learn how to read graphs 2.5d- Distinguish anecdotes form scientific evidence 2.5e- Separate facts from conclusions 2.5f- Understand~~ the value of statistics 2.5c- Learn how to read graphs 2.5d- Distinguish anecdotes form scientific evidence 2.5e- Separate facts from conclusions 2.5f- Understand the differences between correlation and causation ~~2.5g-~~	Exams/I
TO3	Chemistry of Living ~~of Living~~ Things	3.1-All matter consists of elements 3.2- ~~elements 3.2-~~ Atoms combine to form molecules 3.3-Life ~~3.3-Life~~ depends on water 3.4- ~~3.4-~~ The importance of hydrogen ions 3.5- ~~3.5-~~ The organic molecules of living organisms	Exams/I
TO4	Structure and Function of Cells ~~Structure and Function of Cells~~	4.1-Cells are classified according to their internal organization 4.2- ~~4.2-~~ Cell structure reflects cell function 4.3- ~~4.3-~~ A plasma membrane surrounds the cell 4.4- ~~34.4-~~ Molecules cross the plasma membrane in several ways 4.5- ~~44.5-~~ Internal structures carry out specific functions 4.6- ~~54.6-~~ Cells have structures for support and movement 4.7- ~~4.7-~~ cells use and transform matter and energy	Exams/I
TO5	Cell Reproduction and Differentiation ~~Cell Reproduction and Differentiation~~	5.1- The cell cycle creates new cells 5.2- ~~5.2-~~ Replication, transcription and translation – an overview 5.3- Cell reproduction is regulated 5.4-Environmental factors influence cell differentiation ~~Exams/Projects/Lab 8: all 5.3- Cell reproduction is regulated 5.4-Environmental factors influence cell differentiation~~	Exams/I
TO6	From Cells to Organ Systems ~~From Cells~~	6.1-Tissues are groups of cells with a common function	Exams/I

	~~From Cells to Organ Systems~~ From Cells ~~to Organ Systems~~	~~6.1 Tissues are groups of cells with a common function~~ 6.2- ~~6.2-~~ Epithelial tissues cover body cavities and surfaces 6.3- ~~6.3-~~ Connective tissue supports and connects body parts 6.4-Muscle ~~6.4-Muscle~~ tissues contract to produce movement 6.5Nervous ~~6.5Nervous~~ tissue transmits impulses 6.6- ~~impulses 6.6-~~ Organ and organ systems perform complex functions 6.7- ~~6.7-~~ The skin as an organ system 6.8- ~~6.8-~~ Multicellular organisms must maintain homeostasis	~~Exams/I~~
TO7	Human Systems ~~Human Systems~~	7.1The skeletal system 7.2- ~~7.2-~~ The muscular system 7.3- ~~7.3-~~ Blood 7.4- ~~7.4-~~ Heart and blood vessels 7.5- ~~7.5-~~ The immune system and mechanisms of defense 7.6- ~~7.6-~~ The respiratory system: exchange of gases 7.7- ~~7.7-~~ The nervous system – integration and control 7.8- ~~7.8-~~ The endocrine system	Exams/I
TO8	Cancer	8.1- Tumors can be benign or cancerous 8.2- ~~cancerous 8.2-~~ Cancerous cells lose control over cell functions 8.3- ~~8.3-~~ How cancer develops 8.4- ~~8.4-~~ Advances in diagnosis enable early detection 8.5- ~~8.5-~~ Cancer treatments 8.6- ~~8.6-~~ The ten most common cancers 8.7- ~~8.7-~~ Most cancers can be prevented	Exams/I
TO9	Genetics and Inheritance ~~Genetics and inheritance~~	9.1- Alleles are different forms of homologous genes 9.2- Genetic inheritance follows certain patterns 9.3- Sex-linked inheritance: ~~genes Exams/Projects/Lab 8: all 9.2- Genetic inheritance follows certain patterns 9.3- Sex-linkedinheritance:~~X and Y chromosomes carry different genes 9.4- ~~genes 9.4-~~ Chromosomes may be altered in number of structure 9.5- ~~9.5-~~ Inherited genetic disorders usually involve recessive alleles 9.6- ~~9.6-~~ Genes code for proteins, not for specific behaviors 9.7- ~~9.7-~~ DNA can be modified in the laboratory	Exams/I
TO10	Development and Aging ~~Development and Aging~~	10.1- Fertilization occurs when sperm and egg unite 10.2- ~~10.2-~~ Development: cleavage, morphogenesis, differentiation, and growth 10.3- ~~10.3-~~ Pre-embryonic development: the first two weeks 10.4- ~~10.4-~~ Embryonic development: weeks three to eight 10.5- ~~10.5-~~ Fetal development: eight weeks to birth 10.6- ~~10.6-~~ Birth and early postnatal period 10.7- ~~10.7-~~ From birth to adulthood 10.8- ~~10.8-~~ Aging takes place over time 10.9- ~~10.9-~~ Death is the final transition	Exams/I

12. Methods of Instruction

In the structuring of this course, what major methods of instruction will be utilized?	Interactive lecture, ~~o~~ Hands on exploration, ~~o~~ PowerPoint, o Videos.

13. General Education Goals Addressed by this Course (this section is to fulfill state requirements)

Information

Communication-Written and Oral	Yes

Related Course Learning Outcome	all
Related Outline Component	all

Assessment of General Education Goal (Recommended but not limited to)
Quizzes, Exams and/or Projects

Quantitative Knowledge and Skills

Scientific Knowledge and Reasoning Yes

Related Course Learning Outcome	all
Related Outline Component	all

Assessment of General Education Goal (Recommended but not limited to)
Quizzes, Exams and/or Projects

Technological Competency

Information Literacy

Society and Human Behavior

Humanistic Perspective

Historical Perspective

Global and Cultural Awareness

Ethical Reasoning and Action

Independent/Critical Thinking Yes

Related Course Learning Outcome	all
Related Outline Component	all

Assessment of General Education Goal (Recommended but not limited to)
Quizzes, Exams and/or Projects

14. Needs

Instructional Materials (text etc.):	Text, Powerpoint ~~Text, microscopes, models, PowerPoint, balances, skeleton, and chemicals.~~
Technology Needs:	Web-based material and Internet resources
Human Resource Needs (Presently Employed vs. New Faculty):	Presently Employed

Facility Needs: NA

Library needs: NA

15. Grade Determinants

The final grade in the course will be the cumulative grade based on the following letter grades or their numerical equivalents for the course assignments and examinations

A: Excellent

B+: Very Good

B: Good

C+: Above Average

C: Average

D: Below Average

F: Failure

I: Incomplete

R: Audit

For more detailed information on the Ocean County College grading system, please see Policy #5154.

16. Board Approval

History of Board approval dates

Revised: December, 1990

Revised: February 27, 1996

Revised: April 30, 1996

Revised: December, 1998

Revised: May 4, 2004

Revised: August 18, 2005

Revised: August 27, 2007

Revised: April 27, 2009

Revised: May 22, 2012

Board of Trustees Approval Date: January 26, 2017

Reviewer Comments

EXHIBIT B-6

Course Change Request

Date Submitted: 07/10/25 4:01 pm

Viewing: PHYS 283 : General Physics III Lecture

Last approved: 02/22/21 4:00 am

Last edit: 07/10/25 4:01 pm

Changes proposed by: James Marshall (jmarshall)

Catalog Pages referencing this course

- Approved General Education Courses
- Physics and Astronomy (PHYS)

Programs referencing this course

- AS.ENGR: Engineering, Associate in Science

Learning Outcomes

Display (show only)

In Workflow

1. **STEM Academic Administrator**
2. **STEM Dean**
3. **Executive Director of Curriculum and Program Development**
4. **Curriculum Committee Chair**
5. **Senate Chair**
6. Vice President of Academic Affairs
7. Cabinet
8. President
9. Board of Trustees Chair
10. STEM Academic Administrator
11. Colleague

Approval Path

1. 07/10/25 4:03 pm Connor Sampson (csampson): Approved for STEM Academic Administrator
2. 07/10/25 4:04 pm Vandana Saini (vsaini): Approved for STEM Dean
3. 07/11/25 7:19 am James Marshall (jmarshall): Approved for

EXHIBIT B-6

Executive Director of Curriculum and Program Development

4. 08/15/25 9:22 am Caroline Brittain (cbrittain): Approved for Curriculum Committee Chair

History

1. Feb 22, 2021 by soconnor

1. Course Information

Subject	PHYS - Physics and Astronomy
School	Science, Technology, Engineering, Mathematics
Course Title	General Physics III Lecture

2. Hours

Semester Hours	3.00000 ~~4.00000~~	
	Lecture	3.00
	Lab	~~3.00~~
	Practicum	0

3. Catalog Description

For display in the online catalog

This calculus-based course is a survey of topics in modern physics. The course opens with a discussion of light and its propagation, specifically in different frames of reference. Consequences of relativity are discussed, including time dilation, length contraction, and relative simultaneity, as well as the impacts on the quantities of mechanics, contrasting with relativistic and Newtonian mechanics. The course moves on to addressing the failures of

classical physics to explain important observations leading to early quantum theory, including the photoelectric effect, the Bohr model of the atom, atomic spectra and blackbody radiation. Finally, the modern treatment of quantum mechanics is developed, using matter waves, wave functions and quantum mechanical states, the Born interpretation, and Schrodinger's equation, including solving this for simple potentials.

4. Requisites

Prerequisites

~~PHYS-282,~~ MATH-266

Corequisites

MATH-267

For the first attempt PHYS 283L is considered a corequisite. If the student should fail either lecture or lab after the first attempt, then they may take the individual failed section. ~~MATH-267~~

5. Course Type

Course Type for Perkins Reporting	non-vocational (not approved for Perkins funding)

6. Justification

Describe the need for this course

This course will contribute to the fulfillment of the ~~Lab~~ Science general education requirement for graduation and transfer. It is highly recommended for all students planning to major in engineering and physical science and also recommended as an elective for pre-med and computer science.

7. General Education

Will the college submit this course to the statewide General Education Coordinating Committee for approval as a course, which satisfies a general education requirement?

Yes

General Education Category

EXHIBIT B-6

~~Lab Science~~

Science (Non-Lab)

General Education Status	Approved

8. Consistency with the Vision and Mission Statements, the Academic Master Plan, and the strategic initiatives of the College

Please describe how this course is consistent with Ocean County College's current Vision Statement, Mission Statement, Academic Master Plan, and the strategic initiatives of the College:

	Add item
1	Demonstrating the college's commitment to offer comprehensive educational programs that develop intentional learners of all ages. (Mission Statement)
2	Seeking to ensure that students will thrive in an increasingly diverse and complex world. (Vision Statement)
3	Preparing students for successful transfer to other educational institutions and/or for entrance into the workforce. (Academic Master Plan)
4	Seeking to empower students through the mastery of intellectual and practical skills. (Academic Master Plan)
5	Challenging students to transfer information into knowledge and knowledge into action. (Academic Master Plan)

9. Related Courses at Other Institutions

Comparable Courses at NJ Community Colleges

Institution	Brookdale CC
Course Title	General Physics III
Course Number	PHYS223
Number of Credits	4 (3+2)
Comments	

Institution	Mercer County CC
Course Title	University Physics III
Course Number	PHY 225
Number of Credits	4 (3+3)
Comments	

Institution	~~Raritan Valley CC~~
Course Title	~~ENGINEERING PHYSICS III~~
Course Number	~~PHYS 250~~
Number of Credits	~~4 (3+3)~~
Comments	

Institution	County College of Morris
Course Title	Engineering Physics III
Course Number	PHY-232 ~~PHY-232/233~~
Number of Credits	3 ~~4/1~~ ~~(4+1)~~
Comments	

Institution	Bergen CC
Course Title	Physics III
Course Number	PHY-291
Number of Credits	4 (3+3)
Comments	

EXHIBIT B-6

Transferability of Course

Georgian Court University

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
Physics 227, Modern Physics I, 4	General Education	

Kean University

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
Phys 4592, Modern Physics, 4	General Education	Will not transfer

Monmouth University

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
PH301, Modern Physics, 3	General Education	

Rowan University

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
PHYS 02.300, Modern Physics, 4	General Education	

Rutgers - New Brunswick, Mason Gross School of the Arts

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
01750228, ANALYTICAL PHYSICS IIB, 3	General Education	

Stockton University

Course Code, Title, and Credits	Transfer Category	If non-transferable; select status
PHYS3010, PHYSICS III, 4	General Education	

If not transferable to any institution, explain:

10. Course Learning Outcomes

Learning Outcomes

	Students who successfully complete this course will be able to:
CLO1	Use dimensional analysis to perform unit conversions, vet the validity of mathematical expressions representing physical quantities, and to surmise dimensions of unknown quantities.
CLO2	Parse pertinent information of physical systems/scenarios and form mathematical descriptions and constraints (including the use of differential and integral calculus) to address applications
CLO3	Analyze conceptually, graphically, and quantitatively (including the use of differential and integral calculus) and address questions and solve for quantities using modeling and problem solving methods for a given application falling under the following topics: o Special Relativity o Failures of Classical Physics and Old Quantum Theory o Current and Electrical Circuits o Wave Particle Duality and Matter Waves o Quantum Mechanics o Atomic Physics o Nuclear Physics o Particle Physics and Cosmology
~~CLO4~~	~~Estimate uncertainties in measured quantities and calculate the propagated uncertainty in calculated quantities and evaluate the strength of experimental conclusions by comparing uncertainty and error.~~
~~CLO5~~	~~Distinguish between accuracy and precision and determine the limiting factors on experimental results based on measurement resolution, experimental design, etc.~~
~~CLO6~~	~~Perform experiments carefully and methodically to reduce uncertainties and exercising practical reasoning to obtain high quality data.~~
~~CLO7~~	~~Interpret graphical data and use it to draw conclusions and infer physical principles.~~

11. Topical Outline

(include as many themes/skills as needed)

EXHIBIT B-6

	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
TO1	Special Relativity a. Define inertial frames of reference and distinguish between non-inertial frames b. Formulate Gallilean relativity and recover the Galilean transformation equations c. Discuss the Michelson-Morley Experiment and the reference frame independence of the speed of light d. Introuce the postulates of relativity and review their consequences and resulting paradoxes e. Relate the length of time intervals in different inertial frames to each other (calculate time dilation) f. Relate physical lengths in different inertial frames to each other (calculate length contraction) g. Generalize the Doppler effect to light and relativistic considerations h. Recover the Lorentz transformation equations (including velocity transformations) i. Generalize the concepts of momentum and energy into relativistic context j. Discuss the mass energy	Reading assignment Lecture/class discussion Problem sets	Exam	CLO: 1-3

	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
	equivalence and use it to explain nuclear processes k. Briefly introduce the principle of equivalence and general relativity			
TO2	Hydrogen Atom (Bohr Model) a. Define spectra and spectral lines and distinguish between emission and absorption spectra b. Study the hydrogen spectra and quantitatively describe it via the Rydberg formula c. Describe, compare, and contrast the Thompson, Rutherford, and Bohr models for the hydrogen atom d. Use the Bohr model to describe the characteristics of stationary states of electrons, including their radii, energy levels, and frequency of emitted photons between transitions e. Discuss the correspondence principle	Reading assignment Lecture/class discussion Problem sets	Exam ~~Laboratory exercise, exam~~	CLO: 1-3 ~~1-7~~
TO3	Blackbody Radiation a. Define black bodies and blackbody radiation and quantitatively describe it via Stefan's and Wien's	Reading assignment Lecture/class discussion Problem sets Reading ~~setsReading~~ assignment	Exam ~~Laboratory exercise, exam~~	CLO: 1-3 ~~1-7~~

	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
	laws. b. Discuss the Raleigh-Jeans limit, Wein's exponential law, and the failure of these to adequately describe observed spectra c. Compute the spectral energy density (Planck's law) via Planck statistics, using quantization, and show the agreement with observations	Lecture/class discussion Problem sets		
TO4	Photoelectric Effect a. Describe the photoelectric effect and its counterintuitive aspects with regards to expectations from classical physics b. Relate the energy of ejected electrons to the frequency or wavelength of incident light and characteristics of the metal	Reading assignment Lecture/class discussion Problem sets	Exam ~~Laboratory exercise, exam~~	CLO: 1-3 ~~1-7~~
TO5	Compton Effect a. Describe x-ray scattering experiments and their interactions with electrons via the Compton Effect b. Relate the (Compton) shift in a scattered x-ray's wavelength in terms of the direction of scattering, emphasizing that light carries momentum	Reading assignment Lecture/class discussion Problem sets	Exam	CLO: 1-3

EXHIBIT B-6

	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
TO6	Quantum Mechanics a. Introduce the notion of wave-particle duality and quantify the relationship via the de Broglie wavelength b. Characterize wave packets according to their group and phase velocities and apply this to matter waves c. Introduce and use Fourier analysis to construct matter waves d. Discuss the Davisson-Germer and Young's Double Slit experiment for electrons to emphasize the wave nature of particles e. Introduce Heisenberg's uncertainty principle and relate it back to Fourier decomposition f. Use the Born interpretation to introduce wave functions and their (statistical) properties g. Construct the Schrödinger equation and recover the time-independent Schrödinger equation h. Use the Schrödinger equation to solve for the wave functions and energy levels for simple potentials (i.e., one dimensional infinite wells)	Reading assignment Lecture/class discussion Problem sets	Exam	CLO: 1-3

EXHIBIT B-6

	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
	i. Analyze systems with finite wells and introduce tunneling j. Use wave functions to calculate probabilities and expectation values for various physical quantities (positions, momenta, energies, etc)			
TO7	Atomic Physics, Nuclear, Particle Physics, and Cosmology a. Describe the quantum mechanical model for the hydrogen atom b. Motivate the solutions to the Schrödinger equation for a spherical potential c. Characterize the solutions based on quantum numbers and discuss physical correspondence d. Relate the properties of the solutions for hydrogen to general properties inferred from the periodic table e. Describe nuclides and properties of nuclei f. Describe radioactivity, quantify nuclear decay, and introduce decay processes g. Introduce the four fundamental forces and	Reading assignment Lecture/class discussion Problem sets	Exam ~~Laboratory exercise, exam~~	CLO: 1-3 ~~1-7~~

EXHIBIT B-6

	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
	describe them in terms of particle interactions h. Classify particles according to mass and structure, distinguish between leptons, hadrons, and gauge bosons i. Discuss the symmetries and conservations laws regarding particle properties j. Discuss the implications of particle physics on cosmology and introduce current topics in both fields			

12. Methods of Instruction

In the structuring of this course, what major methods of instruction will be utilized?

Lecture/Discussion, Videos, Demonstrations ~~Lecture/Discussion and Laboratory~~

13. General Education Goals Addressed by this Course (this section is to fulfill state requirements)

Information

Communication-Written and Oral

_____

Quantitative Knowledge and Skills

_____

EXHIBIT B-6

Scientific Knowledge and Reasoning Yes

Related Course Learning Outcome CLO: all

Related Outline Component TO: all

Assessment of General Education Goal (Recommended but not limited to)

Reading assignment
Lecture/class discussion
Problem sets ~~Lab exercise~~
Exam

Technological Competency

Information Literacy

Society and Human Behavior

Humanistic Perspective

Historical Perspective

Global and Cultural Awareness

Ethical Reasoning and Action

Independent/Critical Thinking Yes

Related Course Learning Outcome CLO: all

Related Outline Component TO: all

Assessment of General Education Goal (Recommended but not limited to)

Reading assignment
Lecture/class discussion
Problem sets ~~Lab exercise~~
Exam

14. Needs

Instructional Materials (text etc.):

An appropriate textbook will be selected. Please contact the Department Office for current adoptions. Several physical apparatuses (varies by topic) for in-class demonstrations are needed, as well as the space/utilities to accommodate these. Ample board space for instruction is required.

Technology Needs:

A computer and projector for lecture presentations, as well as a projection surface (separate from the board/writing surface). ~~Additionally, a set of computers for students to use for data acquisition, processing, analysis, and report composition are needed for the lab portion of the course, as well as corresponding hardware/equipment (probes, instruments, detectors, computer interfaces, printers, etc.) and software (Microsoft Office Suite, data analysis, etc.).~~

Human Resource Needs (Presently Employed vs. New Faculty):

Peer and professional tutors.

Facility Needs:

~~The laboratory portion requires an appropriate facility to conduct experiments (dry lab).~~

Library needs:

15. Grade Determinants

The final grade in the course will be the cumulative grade based on the following letter grades or their numerical equivalents for the course assignments and examinations

A: Excellent

EXHIBIT B-6

B+: Very Good

B: Good

C+: Above Average

C: Average

D: Below Average

F: Failure

I: Incomplete

R: Audit

For more detailed information on the Ocean County College grading system, please see Policy #5154.

16. Board Approval

History of Board approval dates

- Board of Trustees Approval Date: November 6, 2006
- Board of Trustees Approval Date: September 22, 2008
- Board of Trustees Approval Date: March 26, 2012
- Board of Trustees Approval Date: March 29, 2018
- Board of Trustees Approval Date: May 31, 2018

Reviewer Comments

Key: 1925