**Oglala Lakota College**

**Math Science and Technology Department**

**Course Syllabus**

***Fall 2019***

***Rebuilding the Lakota Nation through Education***

***Wounspe Ihuniyan Hci Lakota Oyate Kin Akta Ic’icakagapi Kte lo***

**Course Number and Name:** Phys 224 – Physics I (3 - 1 credits)

**Instructor:** Charles Jason Tinant **Contact Info:** 605-209-9974 – cell/text

[jtinant@olc.edu](mailto:jtinant@olc.edu) -email

**Class Locations, Dates and Times: Office Hours:**

Pictel: Rapid City **–** Pine Ridge

Lecture: Thursday 9:00 – 12:00

Thursday 12:00 – 1:00 (individual questions)

8:30 – 9:00 (study hall)

**Required Text:**

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| College Physics: A Strategic Approach  [Knight, Jones, Field](http://www.wiley.com/WileyCDA/Section/id-302475.html?query=Karl+F.+Kuhn)  ISBN: 978-0-471-13447-3  320 pages  \* ***Either 3rd or 4th Edition is ok to use***  **Co-requisites:** Math 194 – Calculus I  **Required Materials to be Provided by Students:** Scientific calculator, ruler, paper, and pencils. |

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**Math Science and Technology Vision Statement:** Support the Tribe’s efforts to preserve and protect natural resources thorough producing competent professionals in STEM and preparing our students for graduate school and four-year science and engineering programs.

**Math Science and Technology Mission Statement:** Our mission statement emanates from the Oglala Lakota College mission to *educate students for professional and vocational employment opportunities in Lakota country.* Our program emphasizes a hands-on approach to learning in the classroom and mentoring our research associates in basic science, understanding our natural resource base and assessing environmental conditions in collaboration with Tribal agencies and mainstream Universities.

In achieving the Mission, the OLC STEM department has the following purposes:

**Tribal:** Support and train new and existing Tribal professionals in science, technology engineering, and mathematics thorough academics and problem solving;

**Cultural:** Support, encourage, and respect Lakota values in all aspects of our academic, research, and outreach efforts;

**Academic:** Establish a foundation of academic excellence for our stakeholders in Science, Technology, Engineering, and Mathematics;

**Community:** Positively influence the perception of science, technology, engineering, and mathematics in Tribal communities through formal and informal learning opportunities with the K-12 education community.

**Course Description:** The basic physic principles of Newton’s laws of motion and the conservation laws concerning momentum, energy and angular momentum are applied to the linear and curvilinear motion of particles, simple harmonic motion and the rotation of rigid bodies. An introduction to relativity and quantum concepts will also be included. Prerequisites: Phys 113 completed with a “C” or better or an acceptable score on a qualifying examination and prior/concurrent registration in Math 194.

4 credits

**Course Goal:** The course goal is for students to apply problem-solving to solve real-world problems related to Newton’s Laws of Motion, rotational motion, Conservation of Momentum, and Conservation of Energy.

**Course Rationale**: Physics lies at the center of the natural sciences because almost any scientific problem can be approached using the ideas and methods of physics.Physics explains why things in the natural world happen the way they do. Individuals with a physics backgroundare able to use their understanding to predict how an object will behave under particular conditions, improve the functioning of everyday objects, and envisage totally new developments. This course transfers to SD Regental Institutions as University Physics I.

**Department Goals/Program Learning Outcomes (PLOs):** This course meets the program learning outcome for AA SEM and AA PreEngineering programs: Demonstrate an understanding of Newtonian principals and relationships between forces, energy, work and power

**Student Learning Outcomes (SLOs):** Students completing Introduction to Physics will achieve the following learning outcomes:

**Objectives:** Students who have successfully completed this course with a passing grade will be able to:

1. Use Newton’s law of motion to analyze objects in dynamic equilibrium and undergoing acceleration.
2. Apply Newton’s law of motion to objects undergoing circular or rotational motion & the law of conservation of momentum to objects in linear & rotational motion~~.~~
3. Apply the law of conservation of momentum to objects in motion and at rest.
4. Apply the law of conservation of momentum & energy to objects to determine work and power.

**Instructional Methodology:** This course focuses application of physics principles. A major portion of the class will be devoted to solving equations both in the classroom and as homework.

The following is a general outline for the class times:

11:00 – Study Hall and Individual Questions

12:00 – Discussion of prior week’s lesson & recitation

1:00 – Overview of new material

1:50 – Break (please be back in 10 minutes)

2:00 – Continue new material lecture

2:50 – Break (please be back in 10 minutes)

3:00 – Hands-on learning of new material

3:50 – Summary discussion of new material

3:55 – Feedback to instructor

**Lakota Perspective:** The Lakota perspective will be used and developed in a reflective manner throughout this course. By embracing traditional Lakota Virtues such as **Waohola** (respect), **Wayuonihan** (honor), **Wacantognake** (generosity), **Woohitika** (bravery), **Wacintanka** (perseverance), **Cante Was’ake** (fortitude), and **Woksape** (wisdom) we will create a classroom environment that develops the whole person. We will do this by embracing the teaching of our ancestors as we learn new ways. **Waunspe wicakiyapi ki iglutanyan ihani unpi kun hena itan waunspe tokeca uha ayin kte.**

**The Path to Success:**

* **Oyabja:** Be prepared for class and come to class on time.
* **Waohola:** Turn off your cell phone and avoid using your laptop for personal use.
* **Woohitika:** Participate actively with your group both inside and outside of class.

**Homework:** Oglala Lakota College follows the Carnegie model for required out of class work requirements. The model requires that students complete two to three hours of week as homework per credit hour of class. Students are expected to read approximately one chapter every other week at 12th grade reading level and to complete problem-solving assignments

**Assessment**: Physics 214 is aligned to program learning outcomes in SEM and PreEngineering. Formative assessment is imbedded into weekly learning activities as homework and group recitation. Student learning outcomes will be assessed using rubrics applied to the midterm and final exams.

**Evaluation and Grading:**

Assignments will be provided via lesson plans. Late assignments will receive a 20% reduction in grade for each week late—maximum 40% reduction. Missing assignments will receive a zero grade.Unless otherwise specified, assignments are due approximately one week after they were assigned on Friday at 5PM.

* Assignments: 40 points x 13 graded assignments: 500 points
* Midterm and final exams: 250 points x 2 exams: 500 points

Total: 1,000 points

The Math Science and Technology Department grading scale is given below:

*90% - 100% = A*

*80% - 89% = B*

*70% - 79% = C*

*60% - 69% = D*

*0% - 59% = F*

*A = Superior Quality Work: Mastery of course content at the highest level of attainment. The grade A indicates a student shows comprehensive knowledge and understanding of the subject matter. The student has demonstrated outstanding promise in discipline under study by scoring 90% or higher on course assignments.*

*B = Good Quality Work: Strong performance at a high level of attainment. The grade B indicates a student shows moderately broad knowledge and solid understanding of the subject matter. The student has demonstrated promise in the discipline under study by scoring 80-89% on course assignments.*

*C = Satisfactory Quality Work: Adequate, but not solid, level of attainment of course content. The grade C indicates a student shows reasonable knowledge and understanding of subject matter. By scoring 70-79% on course assignments, the student may continue to study in the discipline with reasonable hope of continued progress.*

*D = Marginal Quality Work: Minimal level of attainment of course content. The grade D indicates a student shows minimal knowledge and understanding of subject matter. By Scoring 60-69% on course assignments, the student has not demonstrated prospective growth in the discipline.*

*F = Unacceptable: Almost no attainment of course content. The grade F indicates a student shows an unacceptable low level of knowledge and understanding of subject matter. By scoring 59% or below, the student has not demonstrated the growth necessary for further study in the discipline.*

**Oglala Lakota College Policies:**

All policies regarding students are fully disclosed in the Oglala Lakota College Student Handbook which may be accessed at the above link. The following policies should be reviewed as pertinent to this course:

**Attendance Policy** (81-350) **Tardiness Policy** (81-370)

**Academic Dishonesty** (76-300) **Academic Freedom** (76-100)

**Disability Policy** (85-600) **Standards of Conduct** (86-300)

**Computer Account and Network Policy** (93-500) **Dropping / Adding Courses** (81-300)

If you have a disability for which you may need an accommodation, notify your instructor and contact the Coordinator of Student Affairs at 455-6083 as early in the semester as possible.

**Early Alert System:** The Enrollment Management Program of Oglala Lakota College has an Early Alert System in place to provide support for students. This system will be utilized by the instructor to report concerns regarding attendance, missing assignments, or any other matters that may impact the student’s ability to successfully complete the course.

**Disclaimer:** Information contained in this syllabus was, to the best knowledge of the instructor, considered correct and complete when distributed for use at the beginning of the semester. However, this syllabus should not be considered a contract between Oglala Lakota College and any student. The instructor reserves the right to make changes in course content or instructional techniques without notice or obligation. Students will be informed of any such changes. Additional student rights and responsibilities are outlined in the Student Handbook.

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| Week. No | Date | Topic | Text Assign. |
| 1 | Aug 30 | Introduction,  Applying Newton’s Laws | 5.1 – 5.4 |
| 2 | Sept 5 | Applying Newton’s Laws Cont. | 5.5 – 5.8 |
| 3 | Sept 12 | Circular Motion, Orbits and Gravity | 6.1 – 6.3 |
| 4 | Sept 19 | Circular Motion, Orbits and Gravity cont. | 6.4 – 6.6 |
| 5 | Sept 26 | Rotational Motion | 7.1-7.4 |
| 6 | Oct 3 | Rotational Motion cont. | 7.5-7.8 |
| 7 | Oct 10 | Equilibrium and Elasticity | 8.1-8.2 |
| 8 | Oct 17 | Review &  Midterm Exam |  |
| 9 | Oct 24 | Momentum | 9.1-9.4 |
| 10 | Oct 31 | Momentum cont. | 9.5-9.7 |
| 11 | Nov 7 | Energy & Work | 10.1-10.5 |
| 12 | Nov 14 | Energy & Work cont. | 10.6-10.10 |
| 13 | Nov 21 | Using Energy | 11.1-11.4 |
| 14 | Dec 5 | Using Energy cont. | 11.5-11.8 |
| 15 | TBD | Review for Final Exam |  |

**Course Rubrics**

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| --- | --- | --- | --- | --- |
|  | **3 points** | **2 points** | **1 points** | **Non-contributive Behaviors** |
| **Wolakokiciyapi**  **Instructor expectation is students will score 2.5 points** | Arrives on time and stays until end of class;  Contributes to the discussion;  On task throughout the class;  Helps classmates and instructor; | Arrives on time or stays until end of class;  Somewhat contributes to the discussion;  Mostly on task;  Somewhat helps classmates and instructor | Neither arrives on time nor stays until end of class;  Does not contribute to the discussion;  Mostly not on task;  Does not help classmates and instructor | Arriving late / leaving early  Negatively affecting class mood;  Distracting behaviors including using a cellphone during class;  Coming to class unprepared |

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| **Homework** | **50 points**  **Excellent** | **40 points**  **Good** | **30 points**  **Fair** | **20 points**  **Poor** | **10 points**  **Unacceptable** |
| Instructor expectation is that students will score 40 of 50 points;  9 assignment x 40 pts =  min 360 pts expected | All problems completed  Work is very easy to follow  Answers correct with proper significant figures and units (1 – 2 minor errors in significant figures, rounding, or units will be allowed)  All graphs shown with units and titles | All problems attempted -*missing at most a portion of one problem*  Work is somewhat easy to follow  Occasional incorrect answers or several minor errors in significant figures and units  Graphs shown some minor errors | Most problems attempted  *missing 1 – 2 problems or portions*  Work is somewhat difficult to follow - *missing work for a few problems*  Several missing or incorrect answers or multiple significant figure and unit errors  Graphs with major errors | Majority of problems attempted (missing several problems or portions of problems)  Work is somewhat difficult to follow  Partially incomplete problems, incorrect answers, and multiple significant figure and unit errors;  Missing graphs for some problems | Few problems attempted missing half of the assignment or more  Missing work for several problems  Incomplete problems, incorrect answers, and total disregard for significant figures and units  Missing graphs for most problems |

**Draft Updated Objectives:** Students who have successfully completed this course with a passing grade will be able to:

1. Use Newton’s law of motion to analyze objects in static and dynamic equilibrium, and objects undergoing acceleration.
2. Apply Newton’s law of motions to objects undergoing circular or rotational motion.
3. Apply the laws of conservation of momentum and energy to objects in at rest and in motion

to determine momentum, kinetic and potential energy, work and power