



# **Integrated Physics and Chemistry (IPC) 1B Syllabus**

## **Course Name**

IPC 1B

Integrated Physics and Chemistry – Semester B

## **Course Information**

IPC 1B is the second semester of this two-semester course.

IPC is an introduction to a variety of topics within the physical sciences including energy, matter, force, and motion. The second semester of this course deals primarily with introductory physics concepts. The topics included in this semester are:

- motion;
- forces;
- momentum;
- energy;
- waves;
- electricity;
- thermal energy;
- energy conservation;
- connections between physics, chemistry, and other scientific disciplines; and
- physics-related careers.

## **Course Delivery Method**

Online

## **Contacting Your Instructor**

You may contact your instructor through the Blackboard messaging system. Technical support is available 24/7 at [www.k12.ttu.edu](http://www.k12.ttu.edu).

## Course Objectives

After completing this course, you should be able to:

1. explain the nature of science;
2. describe how scientific inquiry differs from other types of questioning;
3. describe concepts of force and motion, including the relationship between them;
4. describe force and motion in mathematical and graphical representations;
5. demonstrate and investigate multiple forms of energy and the transfer of energy between them; and
6. research and describe how energy, force, and motion affect everyday life.

IPC addresses the required Texas Essential Knowledge and Skills (TEKS). These can be found at the [Texas Education Agency](https://www.tea.state.tx.us/TEKS/) website.

## Textbook and Materials

### ***Textbook(s)***

There is no required text to purchase for this course. The text is an open resource called Boundless and the readings are available through a direct link in the course.

### ***Materials***

The course materials needed for Integrated Physics and Chemistry are listed in each experiment. They are typical items that can be found in most households.

## Technical Requirements

- Internet access – preferably high speed (for accessing Blackboard)
- Email
- Word processing software such as Microsoft Word
- Adobe Reader (download from [Adobe.com](https://www.adobe.com/))
- Audio and video capabilities (for watching/listening to course content)
- PDF app (free options available)

## Technical Skill Requirements

Be comfortable with the following:

- using a word processor
- Internet search engines and browsers
- creating PDFs (see **Requirements for Creating PDFs** in the Syllabus section of your course)

## Course Organization

This course consists of nine lessons and a final examination. Each lesson contains the following:

- Introduction and Instructions
- Learning Objectives and Curriculum Standards
- Learning Activities
- Assignments

Each lesson includes several activities that present content knowledge. Each lesson also includes multiple graded assignments to ensure that you learn the content that has been presented in the activities. Some of the assignments are automatically-graded quizzes, and some are written assignments or activities that your instructor will grade. Be sure you read all instructions carefully and ask your instructor for help if something is not clear.

The lessons consist of an Introduction and Lesson Objectives that will tell you what you should learn by the end of the lesson. They will give you an idea of what is covered in the lesson assignment and the final exam. You will submit assignment answers and activities as required.

Your assignments are representative of the types of questions you will see on the final. The final exam will be proctored, and **you may not use your notes or assignments when taking the final.**

## Lab Reports and Other Uploads

### *Activity Lab Reports*

Many of the lessons will ask you to conduct your own scientific research or experiments and then write about your experiences. When instructed, you will be filling out the Experiment Report Form. Begin by downloading the **Experiment Report** (MS Word document) for the lesson. Then, while you follow the procedure for each lab, complete the form and submit it. As you fill in the form for each experiment, be sure to use your own words; do not copy from the textbook or this course. The general format used for most of the experiments in the course include the following.

- **Problem:** What question or problem is being addressed?
- **Background:** What do you know about the problem before you begin the experiment?
- **Hypothesis:** Before you complete the experiment, explain what you think will happen. The experiment instructions will guide you. Do not worry about writing an incorrect hypothesis; write what you honestly think will happen in the experiment.

- **Materials:** Make a list of all materials used in the experiment.
- **Procedure:** Read the whole experiment before you begin, to get an idea of what you will be doing. Write down the procedure you follow to perform the experiment, and be sure you are reporting what you did (“I stretched the Slinky across the table”) rather than instructing someone how to perform the experiment (“Stretch the Slinky across the table”).
- **Results:** Explain in your own words what happens when you perform the activity (what you are actually observing).
- **Conclusion:** Determine why the experiment happens the way it does and describe what you learned.
- **Further Questions:** What have you learned from this experiment that can lead to new questions?

When you are finished filling out the form, save your work as either a Word document or a PDF (see **Requirements for Creating PDFs** in the Syllabus section of your course). Upload the completed form for grading.

### ***Other Uploads***

You will notice, as you get into the course, that there are several assignments that require you to draw or create tables, graphs, models, etc., that may not be simple to upload for grading. In these cases, there are several options for submitting your work. One option is to take a photograph of your work and then either submit the photo as a JPG or PNG file or paste it into a Word document for submission. Another option is to scan your hand-written page, save it as a PDF, and submit that for grading.

## **Course Outline**

Please note that some assignments will be hidden from you when you start the course. As you move through the lessons and complete assignments, more will unlock for you.

| <b>Lesson</b>       | <b>Topic</b>                   | <b>Approximate Time for Completion</b> |
|---------------------|--------------------------------|--|
| <b>Lesson 1</b>     | Motion: Introduction           | Two weeks                              |
| <b>Lesson 2</b>     | Motion: Speed and Acceleration | Two weeks                              |
| <b>Lesson 3</b>     | Motion: Forces and Momentum    | Two weeks                              |
| <b>Lesson 4</b>     | Energy: Potential and Kinetic  | Two weeks                              |
| <b>Midterm Exam</b> |                                |  |
| <b>Lesson 5</b>     | Energy: Waves                  | Two weeks                              |
| <b>Lesson 6</b>     | Energy: Electricity            | Two weeks                              |

| <b>Lesson</b>     | <b>Topic</b>                            | <b>Approximate Time for Completion</b> |
|-------------------|---|--|
| <b>Lesson 7</b>   | Energy: Thermal Energy and Conservation | Two weeks                              |
| <b>Lesson 8</b>   | Energy: Societal Impacts                | Two weeks                              |
| <b>Final Exam</b> |   |  |

## Assignment Schedule

Each of the following must be completed to complete the course. Items with an asterisk (\*) indicate that these are summative assessments for the course.

| <b>Lesson</b> | <b>Weeks</b> | <b>Assignments</b>  |
|---------------|--------------|---|
| <b>1</b>      | 1-2          | Checkpoint 1 (Non-graded)<br>Lesson 1 Journal<br>Lesson 1 Experiment<br>Lesson 1 Inquiry Activity<br>Lesson 1 Discussion<br>Lesson 1 Quiz |
| <b>2</b>      | 3-4          | Lesson 2 Journal<br>Lesson 2 Experiment:<br>Lesson 2 Inquiry Activity<br>Lesson 2 Discussion<br>Lesson 2 Quiz                             |
| <b>3</b>      | 5-6          | Lesson 3 Journal<br>Lesson 3 Experiment<br>Lesson 3 Inquiry Activity<br>Lesson 3 Discussion<br>Lesson 3 Quiz<br>Checkpoint 2 (Non-graded) |
| <b>4</b>      | 7-8          | Lesson 4 Journal<br>Lesson 4 Experiment<br>Lesson 4 Inquiry Activity<br>Lesson 4 Discussion<br>Lesson 4 Quiz                              |
|               |              | *Midterm Exam   |

| <b>Lesson</b> | <b>Weeks</b> | <b>Assignments</b>  |
|---------------|--------------|---|
| <b>5</b>      | 9-10         | Lesson 5 Journal<br>Lesson 5 Experiment<br>Lesson 5 Inquiry Activity<br>Lesson 5 Discussion<br>Lesson 5 Quiz                              |
| <b>6</b>      | 11-12        | Lesson 6 Journal<br>Lesson 6 Experiment<br>Lesson 6 Inquiry Activity<br>Lesson 6 Discussion<br>Lesson 6 Quiz                              |
| <b>7</b>      | 13-14        | Lesson 7 Journal<br>Lesson 7 Experiment<br>Lesson 7 Inquiry Activity<br>Lesson 7 Discussion<br>Lesson 7 Quiz                              |
| <b>8</b>      | 15-16        | Lesson 8 Journal<br>Lesson 8 Experiment<br>Lesson 8 Inquiry Activity<br>Lesson 8 Discussion<br>Lesson 8 Quiz<br>Checkpoint 3 (Non-graded) |
|               |              | <b>Final Exam</b>   |

## Course Credit

Each lesson is comprised of Practice Exercises and graded Assignments. The Practice Exercises include a variety of activities which will check your understanding of vocabulary, concepts, skills, calculations, lab activities, etc. The assignments include written assignments, quizzes, discussions, and lab activities that will be submitted for grading. All lesson assignments will be submitted through Blackboard.

The course grade will be calculated as follows:

- 50% coursework average;
- 50% summative assessment average, including the final exam;
- A passing course grade is 70 or higher.

Students must attempt all assignments in the course. The final exam will not be available until all assignments have been accepted and graded by the teacher.

Students who score below 70% on the final exam will be eligible for one re-exam opportunity.

## Coursework

The graded assignments within each lesson are formative in nature. This means that they are designed to assist you in applying and demonstrating the lesson concepts, as well as identifying areas in which you need additional review. You may use all the lesson's learning activities to assist you as you complete the graded assignments.

## Summative Assessments

Summative assessments are those that allow you to demonstrate mastery of the course objectives. For summative assessments, you will NOT be allowed to use the learning materials. These are opportunities for you to show what you have learned by that point in the course. Summative assessments may be proctored using the online proctoring system Proctorio. Information about Proctorio is provided in **Remote Proctoring** in the Syllabus section of your course. The summative assessments for this course are as follows:

- Summative Assessments **(20% of Course Grade)**
  - Midterm Exam
- Summative Final Exam **(30% of Course Grade)**

## Course Completion

- Students may not complete the course in less than 30 days.
- All courses expire six months after the enrollment date.

## Academic Integrity

It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and high standard of integrity. The attempt of students to present as their own any work not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offenders liable to serious consequences, possibly suspension.

“Scholastic dishonesty” includes, but is not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor) or the attempt to commit such an act.

## Student Expectations

You will be expected to log into the Blackboard course regularly to be aware of possible announcements/reminders and to pace your progress in the course.

Students are expected to maintain an online environment conducive to learning, which includes “netiquette” (Internet etiquette). Please review the basic rules for [Online Discussion Netiquette](#). Ensure that your email messages, discussion board postings, and other electronic communications are thoughtful and respectful. Diverse opinions are welcome in this course, and you are expected to demonstrate an open mind and courtesy when responding to the thoughts and ideas of others.

The following are prohibited:

- making offensive remarks in email or the discussion board;
- using inappropriate language or discussing inappropriate topics online;
- spamming;
- hacking;
- using TTU or Blackboard email or discussion boards for commercial purposes;
- using all caps (considered shouting in online communications); and
- cyber-bullying or online harassment of any type.

Inappropriate behavior shall result in consequences ranging from a request to correct the problem, to removal from the course or even the university, depending on the severity of the behavior. Disciplinary actions will be taken according to the TTU K-12 Student Handbook.

## **Communication**

- You can expect a reply from your instructor within 2 business days.
- Use the Blackboard Course Messages tool for sending messages to your instructor.

## **Submitting Assignments**

You will submit all assignments through the Blackboard Assignment Tool, rather than by mail or email.

## **Technical Difficulties**

### ***Getting Help***

For student assistance with Blackboard, visit [TTU K-12 Support](#).

### ***Computer Problems***

A working computer is necessary for online coursework. Computer problems will not be accepted as a valid reason for failure to complete course activities within the allotted time frame. Identify a second computer, before the course begins, that you can use if you experience computer problems.

***Server Problems***

When the Blackboard server needs to be taken down for maintenance, the Blackboard administrator will post an announcement in your course informing you of the time and date. If the server experiences unforeseen problems, your course instructor will notify you.

***Lost or Corrupted Files***

You must keep/save a copy of every project/assignment on an external disk or personal computer. In the event of any kind of technology failure (e.g., Blackboard server crash or virus infection, students' own computer problems, loss of files in cyberspace, etc.) or any disputes, the instructor may request or require you to resubmit the files. In some instances, the instructor may need to open another attempt within Blackboard, so communication with your instructor is critical in these circumstances.