IST659: Instructor’s Guide

# Overview

This instructor’s guide explains how to best teach this course using the materials provided.

# Pedagogical Approach (please share with the student)

I would like to spend time explaining the pedagogical approach I use in this course. I am a big believer in the science behind distributed practice. Simply put, you will be more effective learner if you are exposed to the subject matter several times over the week, rather than just one per week. As such, each lesson has three phases, which I recommend you distribute over 4 days each week:

1. **Before Class:** **Coursework phase**. Before our class meeting, you are expected to:
   1. read the assigned textbook chapter and complete the active learning activities,
   2. watch the video lecture and complete the active learning activities therein, and
   3. as you consume the lesson, prepare questions or demonstrations you would like to see pertinent to the course material,
   4. complete a textbook chapter quiz

For best results, try to spread these activities over at least two different days. For instance, you might read on

1. **In-Class. Learning Reinforcement.** During our three-hour class session, we will engage in activities that reinforce of what you have learned and provide feedback for activities completed outside of class. We will:
   1. Answer your posted questions based on the course material. There is an expectation you will come to class with questions and doubts about the course material. These will be addressed and discussed in the in-class session.
   2. Go over the textbook and lecture questions frequently missed by the students offering reinforcement of the concepts as required, 1
   3. Review the quiz answers and discuss problematic questions,
   4. Go over the previous unit’s lab problem set. Students will be expected to post and discuss their solutions, and
   5. Time-permitting, participate in class activities which demonstrate your ability to apply the course material
2. **After Class. Demonstrate what you can apply.** Lab and Problem Set. After class, you are expected to complete:
   1. a lab: a guided activity based on the week’s coursework, and
   2. a problem set: homework problems where you must problem solve and develop solutions to problems related to the week’s coursework.

This system is very effective and once you get used to it, I am certain you will discover it is a productive use of your time.

# Tools Used In This Course

* **Learn-Databases.** This is a containerized database environment with sample data. Students install this on their own computers. This way they can use the database environment beyond the course.  
  <https://github.com/mafudge/learn-databases>
* **Applied Database Management.** Our active learning textbook, custom designed for this course. The chapters, content and examples align with the course and students can follow along in the learn-databases environment. <https://www.greatriverlearning.com/product-details/1947>   
  You will have access to an admin panel where you can view the student responses to questions within the chapter. You can also view the quiz scores, and setup re-takes as needed.
* **Playposit**. This is a question-over-video hosting tool for flipped lessons. The video lectures for this course have been pre-recorded. As students watch the lecture, they must answer questions. There is a dashboard you can access to view responses to the questions.

# Assessment In This Course

Assessment measures what the student has learned. There are appropriate times for assessments, and this is where we go wrong as instructors. We often assess while the student is learning, and this creates high stress situations for the student and only assesses students who can learn independently. It does not support learning from our mistakes and mastery over the materials.

This course is setup to use the mastery model but without the excessive amount of grading that traditionally goes with it. Grading should be easy and not time-consuming for you, and you should think of your grading as assessing where each student is in their learning journey.

Here are the activities in this course, organized by assessment type:

|  |  |  |
| --- | --- | --- |
| Activity | Assessment | Notes |
| Textbook Questions | Not Graded | These are used to help the student learn actively while reading the textbook. You can use the reports to identify common questions the students miss to prepare for lecture. |
| Video Lecture | Not Graded | These are used to help the student learn actively while watching the lecture. You can use the reports to identify common questions the students miss to prepare for lecture. |
| Textbook Quiz | Graded Assessment | The quiz is an early-stage assessment to measure student understanding of key concepts from the unit. The incorrect quiz answers should be discussed / explained in class to help students gain clarity over the concepts. |
| Homework | Effort Graded Assessment | The homework is a practice activity. It is graded not based on correctness (as that’s too early in the learning process) but instead based on student’s effort. An important part of effort grading is metacognition. The student should articulate what they learned, what is still unclear, and how they are struggling. This information will help you to prepare for class and in many ways in just as important as the work itself. |
| Project | Graded Assessment | The project, due at the end of the semester measures how the student can put together what was learned in the course as applied to a case study of their choosing. Their choosing is important as it will make them the subject matter expert (and not you). |

# What Am I Doing in Class?

Because lectures are flipped (students watch them outside of class), you might be wondering what exactly you are going to do in class? The answer, is of course, reinforcing their learning! How do you do that?

## How to Prepare for Class Sessions

The key to being successful as an instructor in this course is to pay attention to your students’ struggles and address them through lecture. Do not assume every student will be vocal about what they do or don’t know. Use the flipped lesson resources to help you.

The day before your class session:

1. Collect notes of common issues, doubts and misunderstandings your students have about the course material for this week’s topic. Do this by reviewing:
   1. incorrect student answers on the quiz,
   2. textbook activity submissions of your students,
   3. engagement questions and comments from the video lectures

Try not to focus on the actual answers, but instead look for the “big picture” do they not understand table joins? Window functions? Etc.

1. Formulate a lesson, for class. I call this the prepared lesson. A prepared lesson can be in a variety of formats, depending on whether students are having trouble with the concepts or the application of them. For example:
   1. Maybe your students aren’t doing well with the relational concepts, You might issue an ungraded quiz and then go over the quiz in class. After the quiz, have another activity students perform on their own to make sure they’ve got it.
   2. Students do not understand how and when to use ranking window functions, plan for an explanation brief activity around it. You might ask students to help you write the SQL to complete a query that can only be solved using a ranking window function, for example. After that example you might have the students work on another challenge in pairs or on their own.
   3. In all cases, these activities should be engaging. Very hands on. Get your students in the habit of asking questions and engaging in the discussion.
2. If you have time review the homework submissions and check for incorrect solutions to go over in class.

## The Class Format

How you fill time under this format? You’d be surprised how quickly it goes. Assuming you’ve prepared for class, here’s the format:

1. Start with a shared google doc where your students can ask open questions about course material. Post the doc so students can see each other’s questions. Make it anonymous so nobody knows who is asking the questions.
2. Organize them into categories.
   1. Meta-questions (e.g. when is the homework due?)
   2. Questions about the current unit
   3. Questions about the homework / previous unit, or prior units.
3. Add your own questions based on what you learned preparing for class.
4. Start class!
   1. Address Meta questions
   2. Wrap up last week
      1. Address questions about previous unit / prior units.
      2. Go over the homework (see below for ideas)
   3. Engage this week
      1. Address questions in the current unit, using activities (see below for ideas)
      2. Wrap-up class reminding students what to do next week!

### Go over the Homework

There are many ways you can make going over the homework more engaging for your students.

1. Ask students to share their solution to the questions, then explain their solution. Use the shared google doc.
2. Anonymously post incorrect solutions and have the class break down where the student went wrong.
3. Encourage students to think about other ways to solve the problem. Ask students to offer up different solutions / interpretations.

### Answering Questions with the current unit

Try not to just lecture here. Make it participatory. You can:

1. Ask the students to help you code the solution.
2. Provide students time to code the solution and have someone post it anonymously.
3. Ask students to provide a similar question to the one posed.