# 1 Instructor

**Dr. Tom Nurkkala**
Associate Professor, Computer Science and Engineering
Director, Center for Missions Computing

| | |
|---|---|
| Office | Euler Science 211 |
| E-Mail | `tnurkkala@cse.taylor.edu` |
| Phone | 765/998-5163 |
| Hours | M 2:00–3:00 |
| | T 2:00-4:00 |
| | W 2:00–3:00 |
| | *Or by appointment* |


# 2 Course Overview

This course focuses on the physical design and construction phases of the system development life cycle. Our goal is to implement a working prototype of the system defined and analyzed in SYS 390 (ISA) as a database-backed web application. We will cover web and database programming, advanced SQL topics, software project management practices, system architecture, and related web technology.

The course comprises two hands-on, lab-heavy segments.

1. For approximately the first five weeks, we will focus on the basics of developing a database-backed web application. This portion of the course is designed to provide everyone in the class with the knowledge and skills necessary to understand and construct a non-trivial web application. We will cover salient topics in class, and you will complete a series of lab exercises that give you practice with the topic of the day.

2. For the remaining ten weeks of the course, you will and your team will construct a prototype application that implements the requirements you gathered in ISA as reflected in your System Requirements Specification (SRS).

# 3 Learning Objectives

When you complete this class you should be able to:

1. Understand the importance of a formal system development methodology to information technology project success

2. Translate a logical design to a physical design

3. Apply user interface design skills

4. Employ agile software project management practices and tools
5. Participate effectively on a software development team
6. Demonstrate relational database skills in both SQL data definition and data manipulation
7. Make effective use of distributed revision control.
8. Use key technologies powering modern web applications: three-tier architecture, web pages, development tools, and servers
9. Apply testing skills, including unit tests and client-side GUI tests
10. Present effectively the results of your work to others

# 4 Text

There is no required text for the course.

# 5 Project

We will continue the project begun in ISA. Our goal is to build working prototypes of a system that implements the bulk of the requirements you envisioned in your SRS in ISA.

## 5.1 Teams

Again this semester, you will work in teams, typically comprising 3–4 students. Unlike ISA, however, I will select the members of the teams in order to ensure each team has a fair balance of technical and non-technical expertise.

I will distribute a brief survey early in the semester that will help me gauge your technical background. The survey also asks you to indicate who you would (and would not) like to have on your team. Although a good balance of skills will override your personal preferences, I do my best to honor your request.

## 5.2 Development Process

Teams will employ a development process based on the standard agile process known as *Scrum*. We will employ an iterative approach to project development in which your team will focus on delivering small increments of functionality that provide both you and me a clear and demonstrable indication of your progress.

As in ISA, **procrastination is the enemy**. Using an agile, iterative process forces you and your team regularly to deliver working software, which not only gives you a clear view of your accomplishments, but helps stem the tide of procrastination.

When the project is under way, we will hold a weekly *Critical Design Review* (CDR). The CDR gives you a chance to present your progress to the class and to practice in various roles on a software development team.

### 5.3 Show-and-Tell

At the end of the semester, we will have a "show and tell" time, during which you will demonstrate your prototype application. Our customer will be invited to join us for your demonstrations, either in person or electronically.

Although this presentation is not *nearly* as formal as your final presentation in ISA, it is nonetheless your opportunity to show off the fruit of a year of your labor. Begin the semester with this end in mind, and stay focused on delivering an excellent and exciting final product!

### 5.4 Technology

For lab assignments and the project, we will be using the following technologies (among others).

- Standard tools and libraries in the Python ecosystem, allowing you to leverage your experience from COS 120 and any other exposure you've had to Python.
- The Flask framework for web development in Python.
- The Git distributed revision control system. We will use Git for several purposes, including to:
  - Distribute and collect lab assignments
  - Coordinate work among your team members
  - Provide insight into your work for grading and guidance
- Github, a common location for sharing Git resources
- The (optional, but highly recommended) PyCharm integrated development environment (IDE).

## 6 Evaluation

The grading breakdown for the course is shown in table 1. Refer to my *Periodic Table of the Grades* (on Moodle) for the grading scheme. I reserve the right to award a higher grade than strictly earned; outstanding attendance and class participation figure prominently in such decisions.

| Category | | | Weight |
|---|---|---|---|
| Labs | | | 40% |
| Project | | | 60% |
| | Github Activity | 40% | |
| | Total Hours | 40% | |
| | CDRs | 10% | |
| | Final Presentation | 10% | |
| | | 100% | |
| Total | | | 100% |

Table 1: Grading details

# 7 Course Expectations

Following are my expectations regarding the course.

## 7.1 Attendance

You are required to attend all class sessions. I will be in class each day, and I expect you to be there also.

In general, I am very understanding about students who must miss class due to a sanctioned Taylor activity, medical appointment, job interview, family emergency, and the like. If possible, let me know in advance that you will not be in class; I will work with you to arrange make-up instruction, homework, exams, etc.

## 7.2 Late Work

All course assignments will include an unambiguous due date. Usually, assignments are due at the beginning of class on the due date. If there are multiple sections of a class, the assignment is due at the beginning of the earliest such section. Barring exceptional circumstances like those mentioned in section 7.1, I expect your work to be submitted *on the due date*. Late work will *not* be accepted.

This policy on late work is intended to prepare you for real-world experience after graduation. In the marketplace, late work is not merely an inconvenience. Missing a deadline may alienate your customer, upset your manager, ruin your project, or terminate your employment! *Now* is the time to learn the self discipline and time management skills required to complete your work when it is due.

## 7.3 Conduct

I expect you to be prepared, awake, aware, and participatory during class. I will not hesitate to ask you to stand or move if you are distracted or sleepy.

I expect you to join in discussions, respond to questions from me and from your colleagues, and ask questions of me. I expect you to hold my feet to the fire if I am being unclear, unkind, or contradictory.

### 7.4 Gizmos

You may not use a laptop, tablet, or similar device to check e-mail, engage in social networking, surf the web, or any other activity not directly relevant to current classroom activity. If you use an electronic gizmo during class for legitimate academic purposes (e.g., note taking), be prepared to demonstrate relevant use on demand at any time.

## 8 Moodle

The Computer Science and Engineering department uses Moodle as our Learning Management System. The URL for Moodle is `https://moodle.cse.taylor.edu`. To sign on to the course site for the first time, you will need an enrollment key. The key for this course is `nerds4christ`.

You are responsible for checking Moodle regularly to keep up with assignment due dates and other announcements. For due dates, *the Moodle calendar is your friend.*

## 9 Slack

This course will use Slack for informal communication, Q&A, last minute announcements, jokes, and the like. You are *strongly* encouraged to join the conversation.

Find the *TU CSE Student* slack team at `tucsestudents.slack.com`. Look there for a *channel* dedicated to the course.

## 10 Academic Integrity

As a student at an institution whose goal is to honor Christ in all that it does, I expect you to uphold the strictest standards of academic integrity. You must do your own work, cite others when you present their work, and never misrepresent your academic performance in any way. Violation of these standards stains the reputations of you as a student, Taylor as an institution, and Jesus as our Lord.

Every assignment should indicate clearly that it is either:

- An **individual** assignment, to be done *entirely by you*, without any direct participation from other students.
- A **group** assignment, to be done *collectively with a group*

Unless otherwise stated, assignments are **individual** assignments.

> Note that you are *always* welcome to get help from the instructor.

A violation of academic integrity may result in your failing the course and other disciplinary action by the University. Refer to the Taylor catalog for the official statement of these ideas.