

# Computer Science Capstone Topic Approval Form

The purpose of this document is to help you clearly explain your capstone topic, project scope, and timeline. Identify each of these areas so that you will have a complete and realistic overview of your project. Your instructor cannot sign off on your project topic without this information.

*Note: You must fill out and submit this form. Space beneath each number will expand as needed.*

*Note: Any costs associated with developing the application will be the responsibility of the student.*

## **INFORM INSTRUCTOR:**

Potential use of proprietary company information: (Y/N) N

## **ANALYSIS:**

1. Project topic and description: Future Oncology wants to add a featured tool on their website that assists potential patients in assessing their lung cancer risk without the need for a detailed consultation. This project will create an estimate of the chance of the individual having lung cancer given the presence of certain symptoms and environmental factors; this number will be an estimated percentage.
2. Project purpose and goals: The purpose is to provide the users of the Future Oncology website with the ability to estimate their likelihood of having developed lung cancer without needing to schedule an introductory consultation. The goal is that these patients will be better able to judge their health needs after knowing their risk percentage and if they should schedule an appointment with Future Oncology for a CT scan.
3. Descriptive method: For the descriptive requirement of the project, I plan on using visualizations of the data. I will be using heatmaps, histograms, and a parallel coordinate plot for said visualization/analysis of the data. The model's accuracy will be evaluated by a confusion matrix and its cross-validation accuracy, due to the high-cost nature of a false negative. Finally, the model's features will be trimmed by doing correlational analysis and removal of categories with little variance. Then, if the accuracy is not sufficient, features will be removed, and the model will be retrained and compared to the previous model.



4. Predictive or prescriptive method: For the predictive method, I plan on training the model using logistic regression. Then the model will be able to predict an approximate the chance that the user has lung cancer, based on their input information and a prediction from the trained model.

**DESIGN and DEVELOPMENT:**

1. Computer science application type (select one):
  - Web
2. Programming/development language(s) you will use:  
I will be using Python 3.13.
3. Operating system(s) or platform(s) you will use:  
I will be using Windows 11 and Jupyter Notebooks.
4. Database Management System you will use:  
I will not be using a database management system.
5. Estimated number of hours for the following:
  - i. Planning and design: 15 hours
  - ii. Development: 40 hours
  - iii. Documentation: 15 hours
  - iv. Total: 75 hours
6. Projected completion date:  
The expected completion date is October 27<sup>th</sup>, 2025.

**IMPLEMENTATION and EVALUATION:**

1. Describe how you will approach the execution of your project.
  1. Start with the acquisition of the lung cancer data from Kaggle
  2. Process the data by cleaning it and removing excess features
  3. Create the model (Choosing a cost function, optimization algorithm, etc.)
  4. Train the data on the model on 80 percent of the data, saving 20 percent for testing
  5. Test the model for accuracy and assess
  6. If it's overtrained, lessen the number of epochs, if it's undertrained, continue training, if the accuracy is still low, change the optimization algorithm until the accuracy is sufficient for general use
  7. Provide detailed documentation of the previous steps
  8. Make sure the model can be updated on new information and/or replaced, in the case of a newly trained model that needs to be added



- a. **(Checked) This project does not involve human subjects research and is exempt from WGU IRB review.**

**STUDENT'S SIGNATURE**

\_\_\_\_Crile Staudt\_\_\_\_\_

By signing and submitting this form, you acknowledge that any costs associated with the development and execution of the application will be your (the student's) responsibility.

**COURSE INSTRUCTOR SIGNATURE:**



**Jim Ashe, Ph.D. Mathematics**

**COURSE INSTRUCTOR APPROVAL DATE:**

**Wednesday, October 1, 2025**

---

