COSC 4372 and COSC 6370
Fundamentals of Medical Imaging

Instructions for Class Project

Submit your final project deliverables on TEAMS.

For your convenience, you can submit your project deliverables as a .ZIP file.

- Name your .ZIP file MedIm2025_ [GroupName].zip
- DO NOT use .rar file format
- Team members must submit the same .ZIP file.

Your submission should include:

1. Project Report

For more information on the content of the report, please refer to the section "Instructions about the Text of the report" (last two pages).

- **Filename:** MedIm2025_Report_[GroupName].docx
- The project report should be in an MS Word document format.
- You must include results, graphs, plots, tables, and figures in your report file to show the outcome of your work.

2. Source Code

- **Filename:** all code related files in folder MedIm2025_Code_[GroupName]
- Your source code in Matlab or Python (Python code submissions in the form of Jupyter Notebook are accepted)
- For more information on the content of the report, please refer to the section "Instructions about the Text of the report" (last two pages).

Must include (if pertinent):

- Artifacts generated by your code, including any output images, plots, graphs, etc.
- Training dataset or a reference to dataset (if applicable)

3. Code Execution Instructions

Filename: README.txt, or README.docx explaining:

- How to prepare code execution environment.
- Any prerequisites, packages, or libraries that need to be installed to run your code and how to download and install them.
- How to run your code to generate results.
- How to download and/or connect your code to any dataset or database repository (if applicable).
- How to run your code to train your AI model (if applicable).
- How to run your code to test, evaluate, and generate results of your AI model (if applicable).
- The instructional team should be able to run your code by following your instructions. Please help us in this matter by submitting detailed instructions.

4. Narrated Presentation

Create a narrated presentation for your project. It should be no longer than 5 min. Each project member should explain part of the presentation with recorded audio.
Filename: MedIm2025_presentation_[GroupName].ppt, pptx, etc.

If you have trouble uploading the project deliverables in TEAMs (file size limit or other issues) please let us know so we can work together to solve the issue.

Please let us know if you have any questions or concerns.

Instructions about the Text of the report

Filename: MedIm2025_report_[GroupName].docx

Members of the team:
List the names of participants, people soft ID numbers, graduate/undergraduate status, and department.

Introduction:
Describe the project, the aims of this work and a short review of what you did and what your conclusions were. List your aims clearly and number them as example, “Aim 1” or First Aim”. That way, in the next section you can refer to them by number also.

Methods:
Describe in detail the methods you used in pursuing your project: software, algorithms, equations, etc. Note that:

- Description of your phantom and its figures should be reported in this section (the phantom is *one of your methods*, it is not a result!).
- Figure of your GUI (if you have one) and examples of the outputs (graphs, images etc) should be included also in this section.

Correlate the aims you listed in your introduction to the methods you used. Example: “… to calculate the parameters we used in Aim number 2, we developed an algorithm shown in the flowchart of figure 4 and then implemented it with the Matlab code … etc”

Results and Discussion:
In this section, report your results and comments about them. Organize them according to your aims. Depending on your project, include here your figures with graphs, images etc.

Conclusions
This should be a short section that reviews your results.

Bibliography:
If you refer to any scientific literature your text, report it in this section. Number each reference according to the order they appear in your text and use these numbers for your in-text citations.

CODE (the hardcopy included as a pdf):
Important: In the report should include:

- A hardcopy of your code, so you can refer to its different sub-routines/functions/etc in your main text.
- Instructions on how to use your code!

Functions: create a folder with the name “ProjectFunctions” and place inside it all the different functions you have written for each specific task. These functions will be called by the GUI as required!

Comments: For each function or piece of code you use, write comments that describe clearly what it does. Also, include comments at the beginning of each function that describes the parameters you are using.

Ground Truth and Analysis of your results:
For projects that involve simulating tissue using phantoms, your ground truth is the phantom you generated! Your analysis should include comparisons between your ground truth and the images output by your code. For AI or graduate projects, your ground truth will be images from the publicly available medical imaging dataset you chose to use, including any augmentation necessary to simulate the data required for your project goal (noise addition, downsampling, etc.).

GUI (if included): A graphics user interface (GUI) implemented with Matlab will be used for interfacing to your code. The purpose of the GUI is to help you with debugging and testing your code. Organize and separate the different tasks. For example:

- A part of the GUI will be devoted to generating a phantom by entering its dimensions, matrix size and its properties. When you run this task, an image of the phantom should appear in a new window and its corresponding matrix (or matrices) should be then available as input to the other tasks (data acquisition or analysis).
- Another part of your GUI will be devoted to acquisition and image reconstruction of your raw data. Then if you change the acquisition parameters (e.g. distance of the x-ray detector or matrix size in MRI) and run it, it should generate a new window where you present your results.