

# Computational Methods in Physics (PHY4605) - Mini Project

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## General Instructions

1. This mini project constitutes 10% of your final grade, and it involves working in a group of four.
2. Each group has been assigned a specific topic corresponding to a chapter in the book [One Hundred Physics Visualizations Using MATLAB - Dan Green \(2013\)](#).
3. In your assigned chapter, you are required to select one subchapter that includes a physics simulation.
4. Your task is to thoroughly review the text and examine the associated code files related to the simulation.
5. Your ultimate goal is to document and present the simulation described in your chosen subchapter.
6. You must submit your documentation by the conclusion of Week 13 on PutraBLAST and present your project during Week 14.
7. If you encounter any uncertainties or have questions, please first revisit the provided instructions. If your inquiries persist, do not hesitate to seek clarification from the lecturer.

## Documenting the Simulation

1. When documenting a MATLAB simulation, it is crucial to reference the text in the book, the associated code file(s), and external sources while creating a Live Script file based on the provided [template](#).
2. The Live Script should encompass a blend of code, explanatory text, and relevant figures, with the text being entirely original and not plagiarized from any sources, including the textbook, while also avoiding AI-generated content.
3. The document's word count, excluding code, should fall within the range of 800 to 1000 words.
4. Each figure included in the Live Script must be accompanied by a caption and a source citation. To ensure transparency and reliability, these sources must be hyperlinked to the original material or webpage.
5. To enhance the readability of the code, it is essential to employ descriptive variable names, insert helpful comments, and adhere to sound programming principles.
6. The code can be divided into sections, allowing for descriptive text to be interspersed.
7. While not mandatory, the use of other Live Editor components like Live Control and Live Task is recommended to enhance code interactivity.
8. It is imperative to validate all functions used in the code to ensure compatibility with the most recent MATLAB version. If any functions have been discontinued, they must be substituted with updated equivalents.
9. The documentation should explicitly specify the required toolboxes needed to execute the code.

10. The evaluation of this documentation will be based on the following criteria: (i) contents and clarity (30 points), (ii) originality (20 points), (iii) quality of code (20 points), and (iv) language and format (10 points). The evaluation rubric is detailed in the [Appendix](#).

## Presenting the Simulation

1. During your presentation, you will have a 12-minute time slot to showcase your MATLAB simulation to the audience.
2. Your primary presentation material will be the Live Script prepared earlier, which should serve as the core of your demonstration.
3. You are encouraged to supplement your presentation with additional media such as presentation slides and videos to enhance the overall learning experience for your audience.
4. While the Live Script may include high-level theories and technical details, your presentation should aim to simplify these theories to ensure the audience's comprehension. To facilitate understanding, you can use visual aids like flowcharts to illustrate the logical flow of your code.
5. You will demonstrate the code by executing it section by section, explaining each part as you go along.
6. It is important to maintain a clear and engaging presentation style. Use a variety of verbal and non-verbal communication techniques to keep the audience's attention.
7. After each section of your presentation, there will be a 3-minute Q&A session for your classmates to ask questions. As audience members, asking relevant and well-thought-out questions will earn you individual marks.
8. The evaluation of your presentation will be based on the following criteria: (i) contents and clarity (30 points), (ii) delivery (20 points), (iii) understanding (20 points), and (iv) teamwork (10 points). The evaluation rubric is detailed in the [Appendix](#).

## Appendix: Evaluation Rubrics

### Documentation of the Simulation

Aspect	Inadequate (0% - 24%)	Satisfactory (25% - 49%)	Good (50% - 74%)	Excellent (75 - 100%)
<b>Contents &amp; clarity (30 points)</b>	Incomplete or inaccurate explanation of theories and concepts. No relevant equations or graphics.	Partial explanation of theories and concepts with inaccuracies. Limited use of equations and graphics.	Adequate explanation of theories and concepts with minor inaccuracies. Use of some relevant equations and graphics.	Comprehensive and accurate explanation of theories and concepts. Effective use of equations and graphics for reader understanding.
<b>Originality (20 points)</b>	High similarity rate (over 30%)	Moderate similarity rate (between	Low similarity rate (between 10-20%)	Very low similarity rate (below 10%)

	according to Turnitin for both plagiarism and AI-generation.	20-30%) according to Turnitin for both plagiarism and AI-generation.	according to Turnitin for both plagiarism and AI-generation.	according to Turnitin for both plagiarism and AI-generation.
<b>Quality of code (20 points)</b>	Poor readability, lack of descriptive variables and comments, outdated code. No interactive components.	Limited readability, use of some descriptive variables and comments, outdated code. Minimal interactive components.	Good readability, use of descriptive variables and comments, code updated for compatibility with the latest MATLAB version. Some interactive components.	Excellent readability, extensive use of descriptive variables and comments, code updated for compatibility, and significant use of interactive components for enhanced user experience.
<b>Language &amp; format (10 points)</b>	Language is not suitable for an undergraduate level audience, contains multiple grammatical errors, and does not follow the provided template.	Language is somewhat suitable for an undergraduate level audience but still contains notable grammatical errors. Some adherence to the provided template.	Language is suitable for an undergraduate level audience with minimal grammatical errors. Adherence to the provided template with minor deviations.	Language is highly suitable for an undergraduate level audience, nearly free from grammatical errors, and closely follows the provided template.

### Presentation of the Simulation

Aspect	Inadequate (0% - 24%)	Satisfactory (25% - 49%)	Good (50% - 74%)	Excellent (75 - 100%)
<b>Contents &amp; clarity (30 points)</b>	Ineffective in conveying accurate theories; presentation lacks clarity. No additional media elements used.	Partially effective in conveying theories with inaccuracies; some clarity but limited audience comprehension. Some media elements contribute, but overall understanding is lacking.	Adequate in conveying accurate theories with minor inaccuracies; clear but not entirely understandable. Most media elements contribute to audience comprehension.	Highly effective in conveying accurate theories with full clarity and understanding. Additional media elements significantly aid audience comprehension.

<b>Delivery (20 points)</b>	Lack of energy and engagement; presenters' voices are unclear and inaudible; ineffective use of verbal and body language; presentation significantly exceeds the allocated time frame.	Limited energy and engagement; voices are somewhat clear and audible; some use of verbal and body language, but audience engagement is limited; presentation slightly exceeds the allocated time frame.	Good energy and engagement; clear and audible voices; effective use of verbal and body language to engage the audience; presentation closely fits within the allocated time frame.	High energy and engagement; clear and easily audible voices; highly effective use of verbal and body language; presentation precisely fits within the allocated 12-minute time frame.
<b>Understanding (20 points)</b>	Presentation reflects a lack of understanding of the subject matter; presenters struggle to provide clear and accurate answers during the Q&A session.	Presentation somewhat reflects an understanding with notable knowledge gaps; some clear and accurate answers during the Q&A session.	Good understanding of the subject matter with minimal knowledge gaps; mostly clear and accurate answers during the Q&A session.	Presentation demonstrates a strong understanding of the subject matter with clear and accurate answers during the Q&A session.
<b>Teamwork (10 points)</b>	Unequal contributions from team members in both preparation and delivery; some team members significantly underperformed.	Unequal contributions from team members in both preparation and delivery; most team members performed at an acceptable level.	Mostly equal contributions from team members in both preparation and delivery; all team members met minimum expectations.	Equal and balanced contributions from all team members in both preparation and delivery; each member actively contributed to the presentation's success.