Professor: Luis A. Anchordoqui **PHY-307**

Physics-307: Mathematical Physics – Online course.

General Information:

This course is classified as "Zero Textbook Cost." The material for the course is available at the course website https://www.lehman.edu/faculty/anchordoqui/307.html

I will be posting weekly announcements on blackboard. Each week the same relevant information you would find on the course website will also be posted on blackboard.

The course consists of 12 modules. Each module has a synchronous lecture (Thursday from 4:00 to 5:40) and a session of group discussion (Tuesday from 4:00 to 5:40). Asynchronous participation in the discussion board forum is highly recommended. There will be 3 midterm exams (10/01/2020; 11/24/2020; 12/08/2020) and a comprehensive final exam (12/15/2020). At the end of each lecture we will have a quiz related to the material of the previous module.

The layout of the document is as follows. We first present the online course development plan. After that we describe the methodology for assessment of student coursework. Finally, we provide some guidelines on how to be successful in the course, and a summary calendar.

Contact information: luis.anchordoqui@lehman.cuny.edu

Professor: Luis A. Anchordoqui **PHY-307**

Course Development Plan

Module 1 (Online)

Date: 08/27/2020 (Lecture) & 09/01/2020 (Group discussion)

Topic: ***Analytic Functions***

Description: Complex Analysis I: Complex Algebra. Functions of a Complex Variable.

Learning Objectives:

1.The educational methodology of this subject proposes to integrate the domain of concepts and knowledge from mathematics into practical application of physics phenomena, and the development of abilities and skills to solve example problems.

2. Student discussion in interactive forums, which aim to improve the instrumental aspects learned through the lectures and experiences outside the walls.

Your Content:

- Reading Materials:
  L. A. Anchordoqui and T. C. Paul, Mathematical Models of Physics Problems (Nova Publishers, 2013); Chapter 1
- Complementary material:
  G. B. Arfken, H. J. Weber, and F. E. Harris Mathematical Methods for Physicists'' (7th Edition) (Academic Press, 2012)

Assignments, Activities:

- Attend a live synchronous lecture and interact with me
  Slide lecture available @ https://www.lehman.edu/faculty/anchordoqui/307_1.pdf
- Solve physics problems.
  Downloadable @ http://lehman.edu/faculty/anchordoqui/307-P1.pdf
- Group discussion of problem solutions.
- Written summary of all problems

Contact information: luis.anchordoqui@lehman.cuny.edu

- In relation to a problem assigned for a discussion session: create a short video summarizing the problem and solution, questions from other students, and my feedback.

Reflective Questions:

- ✓ How are students connecting with you this week?
  - Q&A forum and email
- ✓ How are students connecting with each other this week?
  - Q&A forum
  - Discussion board forum (Module 1)
- ✓ How are students showing what they are learning this week?
  - Presentation of assessment problems in discussion session
  - Summary in a video using multimedia

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Module 2 (Online)

Date: 09/03/2020 (Lecture) & 09/08/2020 (Group discussion)

Topic: ***Integration in the Complex Plane***

Description: Complex Analysis II: Cauchy's Theorem and its Applications.

Learning Objectives:

1.The educational methodology of this subject proposes to integrate the domain of concepts and knowledge from mathematics into practical application of physics phenomena, and the development of abilities and skills to solve example problems.

2. Student discussion in interactive forums, which aim to improve the instrumental aspects learned through the lectures and experiences outside the walls.

Your Content:

- Reading Materials:
  L. A. Anchordoqui and T. C. Paul, Mathematical Models of Physics Problems (Nova Publishers, 2013) Chapter 1
- Complementary material:
  G. B. Arfken, H. J. Weber, and F. E. Harris Mathematical Methods for Physicists'' (7th Edition) (Academic Press, 2012)

Assignments, Activities:

- Attend a live synchronous lecture and interact with me
  Slide lecture available @ https://www.lehman.edu/faculty/anchordoqui/307_2.pdf
- Solve physics problems
  Downloadable @ http://lehman.edu/faculty/anchordoqui/307-P2.pdf
- Group discussion of problem solutions.
- Written summary of all problems
- In relation to a problem assigned for a discussion session: create a short video summarizing the problem and solution, questions from other students, and my feedback.

Contact information: luis.anchordoqui@lehman.cuny.edu

- Watch an asynchronous video summary made by me of each lecture prior to attending the next week's lecture.

Reflective Questions:

- ✓ How are students connecting with you this week?
  - Q&A forum and email
- ✓ How are students connecting with each other this week?
  - Q&A forum
  - Discussion board forum (Module 2)
- ✓ How are students showing what they are learning this week?
  - Presentation of assessment problems in discussion session
  - Summary in a video using multimedia

Professor: Luis A. Anchordoqui **PHY-307**

Module 3 (Online)

Date: 09/10/2020 (Lecture) & 09/15/2020 – 09/22/2020 (Group discussion)

Topic: ***Isolated Singularities and Residues***.

Description: Complex Analysis III: Isolated Singularities and Residues. Laurent's theorem. Cuachy's residue theorem. Jordan's lemma. Cauchy principal value.

Learning Objectives:

1.The educational methodology of this subject proposes to integrate the domain of concepts and knowledge from mathematics into practical application of physics phenomena, and the development of abilities and skills to solve example problems.

2. Student discussion in interactive forums, which aim to improve the instrumental aspects learned through the lectures and experiences outside the walls.

Your Content:

- Reading Materials:
  L. A. Anchordoqui and T. C. Paul, Mathematical Models of Physics Problems (Nova Publishers, 2013) Chapter 1
- Complementary material:
  G. B. Arfken, H. J. Weber, and F. E. Harris Mathematical Methods for Physicists'' (7th Edition) (Academic Press, 2012)

Assignments, Activities:

- Attend a live synchronous lecture and interact with me
  Slide lecture available @ https://www.lehman.edu/faculty/anchordoqui/307_3.pdf
- Solve physics problems.
  Downloadable @ http://lehman.edu/faculty/anchordoqui/307-P3.pdf
- Group discussion of problem solutions.
- Written summary of all problems
- In relation to a problem assigned for a discussion session: create a short video summarizing the problem and solution, questions from other students, and my feedback.

Contact information: luis.anchordoqui@lehman.cuny.edu

- Watch an asynchronous video summary made by me of each lecture prior to attending the next week's lecture.

Reflective Questions:

- ✓ How are students connecting with you this week?
  - Q&A forum and email
- ✓ How are students connecting with each other this week?
  - Q&A forum
  - Discussion board forum (Module 3)
- ✓ How are students showing what they are learning this week?
  - Presentation of assessment problems in discussion session
  - Summary in a video using multimedia

Professor: Luis A. Anchordoqui **PHY-307**

Module 4 (Online)

Date: 09/17/2020 (Lecture) & 10/06/2020 (Group discussion)

Topic: ***Elements of Linear Algebra***

Description: Linear spaces. Matrices and linear transformations

Learning Objectives:

1.The educational methodology of this subject proposes to integrate the domain of concepts and knowledge from mathematics into practical application of physics phenomena, and the development of abilities and skills to solve example problems.

2. Student discussion in interactive forums, which aim to improve the instrumental aspects learned through the lectures and experiences outside the walls.

Your Content:

- Reading Materials:

  L. A. Anchordoqui and T. C. Paul, Mathematical Models of Physics Problems (Nova Publishers, 2013) Chapter 2

- Complementary material:

  G. F. D. Duff and D. Naylor, Differential Equations of Applied Mathematics (John Wiley & Sons, 1966)

  G. B. Arfken, H. J. Weber, and F. E. Harris Mathematical Methods for Physicists'' (7th Edition) (Academic Press, 2012)

Assignments, Activities:

- Attend a live synchronous lecture and interact with me

  Slide lecture available @ https://www.lehman.edu/faculty/anchordoqui/307_4.pdf
- Solve physics problems.

  Downloadable @ http://lehman.edu/faculty/anchordoqui/307-P4.pdf
- Group discussion of problem solutions.
- Written summary of all problems

Contact information: luis.anchordoqui@lehman.cuny.edu

- In relation to a problem assigned for a discussion session: create a short video summarizing the problem and solution, questions from other students, and my feedback.
- Watch an asynchronous video summary made by me of each lecture prior to attending the next week's lecture.

Reflective Questions:

- ✓ How are students connecting with you this week?
  - Q&A forum and email
- ✓ How are students connecting with each other this week?
  - Q&A forum
  - Discussion board forum (Module 4)
- ✓ How are students showing what they are learning this week?
  - Presentation of assessment problems in discussion session
  - Summary in a video using multimedia

Professor: Luis A. Anchordoqui **PHY-307**

Module 5 (Online)

Date: 09/24/2020 (Lecture) & 10/13/2020 (Group discussion)

Topic: **Initial Value Problem (Picard's Theorem)**

Description: Ordinary differential equations I: Setting the Stage. Initial Value Problem: Picard's existence and uniqueness theorem

Learning Objectives:

1.The educational methodology of this subject proposes to integrate the domain of concepts and knowledge from mathematics into practical application of physics phenomena, and the development of abilities and skills to solve example problems.

2. Student discussion in interactive forums, which aim to improve the instrumental aspects learned through the lectures and experiences outside the walls.

Your Content:

- Reading Materials:

  L. A. Anchordoqui and T. C. Paul, Mathematical Models of Physics Problems (Nova Publishers, 2013) Chapter 3

- Complementary material:

  G. F. D. Duff and D. Naylor, Differential Equations of Applied Mathematics (John Wiley & Sons, 1966)

  G. B. Arfken, H. J. Weber, and F. E. Harris Mathematical Methods for Physicists'' (7th Edition) (Academic Press, 2012)

Assignments, Activities:

- Attend a live synchronous lecture and interact with me

  Slide lecture available @ https://www.lehman.edu/faculty/anchordoqui/307_5.pdf
- Solve physics problems.

  Downloadable @ http://lehman.edu/faculty/anchordoqui/307-P5.pdf
- Group discussion of problem solutions.
- Written summary of all problems

Contact information: luis.anchordoqui@lehman.cuny.edu

- In relation to a problem assigned for a discussion session: create a short video summarizing the problem and solution, questions from other students, and my feedback.
- Watch an asynchronous video summary made by me of each lecture prior to attending the next week's lecture.

Reflective Questions:

- ✓ How are students connecting with you this week?
  - Q&A forum and email
- ✓ How are students connecting with each other this week?
  - Q&A forum
  - Discussion board forum (Module 5)
- ✓ How are students showing what they are learning this week?
  - Presentation of assessment problems in discussion session
  - Summary in a video using multimedia

Professor: Luis A. Anchordoqui **PHY-307**

Module 6 (Online)

Date: 10/ 08/2020 (Lecture) & 10/20/2020 (Group discussion)

Topic**: *Initial Value Problem (Green Matrix)***

Description: Ordinary differential equations II: Initial Value Problem: Systems of first-order linear differential equations Green matrix as a generalized function.

Learning Objectives:

1.The educational methodology of this subject proposes to integrate the domain of concepts and knowledge from mathematics into practical application of physics phenomena, and the development of abilities and skills to solve example problems.

2. Student discussion in interactive forums, which aim to improve the instrumental aspects learned through the lectures and experiences outside the walls.

Your Content:

- Reading Materials:

  L. A. Anchordoqui and T. C. Paul, Mathematical Models of Physics Problems (Nova Publishers, 2013) Chapter 3

- Complementary material:

  G. F. D. Duff and D. Naylor, Differential Equations of Applied Mathematics (John Wiley & Sons, 1966)

  G. B. Arfken, H. J. Weber, and F. E. Harris Mathematical Methods for Physicists'' (7th Edition) (Academic Press, 2012)

Assignments, Activities:

- Attend a live synchronous lecture and interact with me

  Slide lecture available @ https://www.lehman.edu/faculty/anchordoqui/307_6.pdf
- Solve physics problems

  Downloadable @ http://lehman.edu/faculty/anchordoqui/307-P6.pdf
- Group discussion of problem solutions.
- Written summary of all problems

Contact information: luis.anchordoqui@lehman.cuny.edu

- In relation to a problem assigned for a discussion session: create a short video summarizing the problem and solution, questions from other students, and my feedback.
- Watch an asynchronous video summary made by me of each lecture prior to attending the next week's lecture.

Reflective Questions:

- ✓ How are students connecting with you this week?
  - Q&A forum and email
- ✓ How are students connecting with each other this week?
  - Q&A forum
  - Discussion board forum (Module 6)
- ✓ How are students showing what they are learning this week?
  - Presentation of assessment problems in discussion session
  - Summary in a video using multimedia

Professor: Luis A. Anchordoqui **PHY-307**

Module 7 (Online)

Date: 10/15 /2020 (Lecture) & 10/27/2020 (Group discussion)

Topic: **Boundary Value Problem (Sturm-Liouville Operator)**

Description: Ordinary differential equations III: Boundary value problem. Self-adjointness of Sturm-Liouville operator Green function of Sturm-Liouville operator.

Learning Objectives:

1.The educational methodology of this subject proposes to integrate the domain of concepts and knowledge from mathematics into practical application of physics phenomena, and the development of abilities and skills to solve example problems.

2. Student discussion in interactive forums, which aim to improve the instrumental aspects learned through the lectures and experiences outside the walls.

Your Content:

- Reading Materials:

  L. A. Anchordoqui and T. C. Paul, Mathematical Models of Physics Problems (Nova Publishers, 2013) Chapter 3

- Complementary material:

  G. F. D. Duff and D. Naylor, Differential Equations of Applied Mathematics (John Wiley & Sons, 1966)

  G. B. Arfken, H. J. Weber, and F. E. Harris Mathematical Methods for Physicists'' (7th Edition) (Academic Press, 2012)

Assignments, Activities:

- Attend a live synchronous lecture and interact with me

  Slide lecture available @ https://www.lehman.edu/faculty/anchordoqui/307_7.pdf
- Solve physics problems

  Downloadable @ http://lehman.edu/faculty/anchordoqui/307-P7.pdf
- Group discussion of problem solutions.
- Written summary of all problems

Contact information: luis.anchordoqui@lehman.cuny.edu

- In relation to a problem assigned for a discussion session: create a short video summarizing the problem and solution, questions from other students, and my feedback.
- Watch an asynchronous video summary made by me of each lecture prior to attending the next week's lecture.

Reflective Questions:

- ✓ How are students connecting with you this week?
  - Q&A forum and email
- ✓ How are students connecting with each other this week?
  - Q&A forum
  - Discussion board forum (Module 7)
- ✓ How are students showing what they are learning this week?
  - Presentation of assessment problems in discussion session
  - Summary in a video using multimedia

Professor: Luis A. Anchordoqui **PHY-307**

Module 8 (Online)

Date: 10/22/2020 (Lecture) & 11/03/2020 (Group discussion)

Topic: **Boundary Value Problem (Special Functions)**

Description: Ordinary differential equations IV: Boundary value problem. Series solutions to homogeneous linear equations.

Learning Objectives:

1.The educational methodology of this subject proposes to integrate the domain of concepts and knowledge from mathematics into practical application of physics phenomena, and the development of abilities and skills to solve example problems.

2. Student discussion in interactive forums, which aim to improve the instrumental aspects learned through the lectures and experiences outside the walls.

Your Content:

- Reading Materials:

  L. A. Anchordoqui and T. C. Paul, Mathematical Models of Physics Problems (Nova Publishers, 2013) Chapter 3

- Complementary material:

  G. F. D. Duff and D. Naylor, Differential Equations of Applied Mathematics (John Wiley & Sons, 1966)

  G. B. Arfken, H. J. Weber, and F. E. Harris Mathematical Methods for Physicists'' (7th Edition) (Academic Press, 2012)

Assignments, Activities:

- Attend a live synchronous lecture and interact with me

  Slide lecture available @ https://www.lehman.edu/faculty/anchordoqui/307_8.pdf
- Solve physics problems.

  Downloadable @ http://lehman.edu/faculty/anchordoqui/307-P8.pdf
- Group discussion of problem solutions.
- Written summary of all problems

Contact information: luis.anchordoqui@lehman.cuny.edu

- In relation to a problem assigned for a discussion session: create a short video summarizing the problem and solution, questions from other students, and my feedback.
- Watch an asynchronous video summary made by me of each lecture prior to attending the next week's lecture.

Reflective Questions:

- ✓ How are students connecting with you this week?
  - Q&A forum and email
- ✓ How are students connecting with each other this week?
  - Q&A forum
  - Discussion board forum (Module 8)
- ✓ How are students showing what they are learning this week?
  - Presentation of assessment problems in discussion session
  - Summary in a video using multimedia

Professor: Luis A. Anchordoqui **PHY-307**

Module 9 (Online)

Date: 10/29/2020 (Lecture) & 11/10/2020 (Group discussion)

Topic: **Fourier Series and Fourier Transform**

Description: Ordinary differential equations V: Fourier analysis. Fourier Series. Fourier Transform

Learning Objectives:

1.The educational methodology of this subject proposes to integrate the domain of concepts and knowledge from mathematics into practical application of physics phenomena, and the development of abilities and skills to solve example problems.

2. Student discussion in interactive forums, which aim to improve the instrumental aspects learned through the lectures and experiences outside the walls.

Your Content:

- Reading Materials:

  L. A. Anchordoqui and T. C. Paul, Mathematical Models of Physics Problems (Nova Publishers, 2013) Chapter 3

- Complementary material:

  G. F. D. Duff and D. Naylor, Differential Equations of Applied Mathematics (John Wiley & Sons, 1966)

  G. B. Arfken, H. J. Weber, and F. E. Harris Mathematical Methods for Physicists'' (7th Edition) (Academic Press, 2012)

Assignments, Activities:

- Attend a live synchronous lecture and interact with me

  Slide lecture available @ https://www.lehman.edu/faculty/anchordoqui/307_9.pdf
- Solve physics problems.

  Downloadable @ http://lehman.edu/faculty/anchordoqui/307-P9.pdf
- Group discussion of problem solutions.
- Written summary of all problems

Contact information: luis.anchordoqui@lehman.cuny.edu

- In relation to a problem assigned for a discussion session: create a short video summarizing the problem and solution, questions from other students, and my feedback.
- Watch an asynchronous video summary made by me of each lecture prior to attending the next week's lecture.

Reflective Questions:

- ✓ How are students connecting with you this week?
  - Q&A forum and email
- ✓ How are students connecting with each other this week?
  - Q&A forum
  - Discussion board forum (Module 9)
- ✓ How are students showing what they are learning this week?
  - Presentation of assessment problems in discussion session
  - Summary in a video using multimedia

Professor: Luis A. Anchordoqui **PHY-307**

Module 10 (Online)

Date: 11/05/2020 (Lecture) & 11/17/2020 (Group discussion)

Topic: **Hyperbolic Partial Differential Equation (Wave equation)**

Description: Partial Differential Equations I: Taxonomy. Wave Equation.

Learning Objectives:

1.The educational methodology of this subject proposes to integrate the domain of concepts and knowledge from mathematics into practical application of physics phenomena, and the development of abilities and skills to solve example problems.

2. Student discussion in interactive forums, which aim to improve the instrumental aspects learned through the lectures and experiences outside the walls.

Your Content:

- Reading Materials:

  L. A. Anchordoqui and T. C. Paul, Mathematical Models of Physics Problems (Nova Publishers, 2013) Chapter 4

- Complementary material:

  G. F. D. Duff and D. Naylor, Differential Equations of Applied Mathematics (John Wiley & Sons, 1966)

  G. B. Arfken, H. J. Weber, and F. E. Harris Mathematical Methods for Physicists'' (7th Edition) (Academic Press, 2012)

Assignments, Activities:

- Attend a live synchronous lecture and interact with me

  Slide lecture available @ https://www.lehman.edu/faculty/anchordoqui/307_10.pdf
- Solve physics problems.

  Downloadable @ http://lehman.edu/faculty/anchordoqui/307-P10.pdf
- Group discussion of problem solutions.
- Written summary of all problems

Contact information: luis.anchordoqui@lehman.cuny.edu

- In relation to a problem assigned for a discussion session: create a short video summarizing the problem and solution, questions from other students, and my feedback.
- Watch an asynchronous video summary made by me of each lecture prior to attending the next week's lecture.

Reflective Questions:

- ✓ How are students connecting with you this week?
  - Q&A forum and email
- ✓ How are students connecting with each other this week?
  - Q&A forum
  - Discussion board forum (Module 10)
- ✓ How are students showing what they are learning this week?
  - Presentation of assessment problems in discussion session
  - Summary in a video using multimedia

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Module 11 (Online)

Date: 11/ 12/2020 (Lecture) & 12/01/2020 (Group discussion)

Topic: **Parabolic Partial Differential Equation (Diffusion equation)**

Description: Partial Differential Equations II: Diffusion Equation. Heat flow. Diffusion in an infinitely long metal bar. Diffusion in a finite metal bar.

Learning Objectives:

1.The educational methodology of this subject proposes to integrate the domain of concepts and knowledge from mathematics into practical application of physics phenomena, and the development of abilities and skills to solve example problems.

2. Student discussion in interactive forums, which aim to improve the instrumental aspects learned through the lectures and experiences outside the walls.

Your Content:

- Reading Materials:

  L. A. Anchordoqui and T. C. Paul, Mathematical Models of Physics Problems (Nova Publishers, 2013) Chapter 4

- Complementary material:

  G. F. D. Duff and D. Naylor, Differential Equations of Applied Mathematics (John Wiley & Sons, 1966)

  G. B. Arfken, H. J. Weber, and F. E. Harris Mathematical Methods for Physicists'' (7th Edition) (Academic Press, 2012)

Assignments, Activities:

- Attend a live synchronous lecture and interact with me

  Slide lecture available @ https://www.lehman.edu/faculty/anchordoqui/307_11.pdf
- Solve physics problems.

  Downloadable @ http://lehman.edu/faculty/anchordoqui/307-P11.pdf
- Group discussion of problem solutions.
- Written summary of all problems

Contact information: luis.anchordoqui@lehman.cuny.edu

- In relation to a problem assigned for a discussion session: create a short video summarizing the problem and solution, questions from other students, and my feedback.
- Watch an asynchronous video summary made by me of each lecture prior to attending the next week's lecture.

Reflective Questions:

- ✓ How are students connecting with you this week?
  - Q&A forum and email
- ✓ How are students connecting with each other this week?
  - Q&A forum
  - Discussion board forum (Module 11)
- ✓ How are students showing what they are learning this week?
  - Presentation of assessment problems in discussion session
  - Summary in a video using multimedia

Professor: Luis A. Anchordoqui **PHY-307**

Module 12 (Online)

Date: 11/ 19 /2020 (Lecture) & 12 /03/2020 (Group discussion)

Topic: **Elliptic Partial Differential Equation (Laplace equation)**

Description: Partial Differential Equations III: Laplace Equation. Harmonics functions. Spherical harmonics. Green function for Laplace operator.

Learning Objectives:

1.The educational methodology of this subject proposes to integrate the domain of concepts and knowledge from mathematics into practical application of physics phenomena, and the development of abilities and skills to solve example problems.

2. Student discussion in interactive forums, which aim to improve the instrumental aspects learned through the lectures and experiences outside the walls.

Your Content:

- Reading Materials:

  L. A. Anchordoqui and T. C. Paul, Mathematical Models of Physics Problems (Nova Publishers, 2013) Chapter 4

- Complementary material:

  G. F. D. Duff and D. Naylor, Differential Equations of Applied Mathematics (John Wiley & Sons, 1966)

  G. B. Arfken, H. J. Weber, and F. E. Harris Mathematical Methods for Physicists'' (7th Edition) (Academic Press, 2012)

Assignments, Activities:

- Attend a live synchronous lecture and interact with me

  Slide lecture available @ https://www.lehman.edu/faculty/anchordoqui/307_12.pdf
- Solve physics problems

  Downloadable @ http://lehman.edu/faculty/anchordoqui/307-P12.pdf
- Group discussion of problem solutions.
- Written summary of all problems

Contact information: luis.anchordoqui@lehman.cuny.edu

- In relation to a problem assigned for a discussion session: create a short video summarizing the problem and solution, questions from other students, and my feedback.
- Watch an asynchronous video summary made by me of each lecture prior to attending the next week's lecture.

Reflective Questions:

- ✓ How are students connecting with you this week?
  - Q&A forum and email
- ✓ How are students connecting with each other this week?
  - Q&A forum
  - Discussion board forum (Module 12)
- ✓ How are students showing what they are learning this week?
  - Presentation of assessment problems in discussion session
  - Summary in a video using multimedia

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Assessment of student coursework

The weekly activities of the courses are divided into lectures and recitations. The recitations are synchronous student presentations of assigned problems. In short, the student presenting the problem is the lead, and I play the role of the moderator between the lead and the class. Homework sets for group discussions are available on the course website. Each homework set consists of questions used as worked examples in lecture, questions covered during discussion, and questions assigned as homework exercises. The problem assignments will be done at the end of each lecture. Students will not be evaluated during the presentations to facilitate a smooth discussion between the class. Each student presenting a problem will post the solution on the Discussion Board Forum to open the debate about that particular problem. For selected problems, the students will create a short video summarizing the problem and solution, questions from other students, and my feedback. The students will be evaluated for the written solution, forum participation and the video clip. Three tests will be given during the semester (October 1, November 24, December 8). Each test will consist of 4 problems that you will have to solve in written format, send via photo attachment, and explain how you solved these problems in a short video clip.

There will be a comprehensive final exam; Thursday December 15 at 3:45 - 5:45 PM. The final will consist of 5 problems that you will also have to solve in written format, send via photo attachment, and explain how you solved these problems in a short video clip. The final is mandatory and you are responsible for making sure that you can attend at this time.

Contact information: luis.anchordoqui@lehman.cuny.edu

- **Grading policy.**

The overall course grade will be determined as follows:

- 10 % - homework assignments (blackboard presentations)
- 20% - quizzes
- 45% - midterm exams (15% each)
- 25% - comprehensive final exam

Letter grades will be assigned according to the guidelines

- A = 90 - 100
- B = 80 - 90
- C = 65 - 80
- D = 50 - 65
- F = below 50

The cutoffs for +'s and -'s will be decided at the end of the semester.

Students will have a portfolio including all their work from the semester. By the end of the semester they will select from this portfolio what they think is the best solved problem with accompanying video. This will help to decide the cutoffs for +'s and -'s.

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How to be successful in Physics 307 - *PLEASE READ CAREFULLY –*

1. This is not an asynchronous course; attendance at lectures and discussions is highly encouraged.
2. Make sure you visit the course website regularly. Check the announcements. You will have to download a set of problems every week. Two or three problems from each homework set will be selected at random for quizzes.
3. QUIZZES: a short (about 10-15 minutes) quiz based on the material covered in recent lectures will be given at the end of every lecture.
4. TESTS: test problems are loosely based on those you will find in the homework sets. Please note that this does not mean these problems will simply be repeated on tests. Please check the schedule of tests for conflicts with religious observance. Please let me know ASAP if you see any conflicts; a different time will be arranged so that you can take the test. Make-up tests will be given only for valid reasons.
5. Please contact me immediately if you think that a genuine mistake has occurred in the grading of tests. Clerical errors in grading will of course be rectified as soon as possible.
6. Students with special requirements/learning disabilities should see me as early as possible during the semester. Note that it is the responsibility of students with special accommodations to contact the instructor as early as possible to make the appropriate arrangements for testing. Please note that I cannot allow students to take tests under conditions different from those experienced by the rest of the class (extra time, separate room, etc.) unless they have the appropriate paperwork (VISA form) from the Student Disability Services. The office of Student Disability Services will issue formal instructions to me about how students with disabilities are to be accommodated.

I look forward to meeting you all and working together on the challenges we will face. It will be tough but in the end we will still have fun.

Contact information: luis.anchordoqui@lehman.cuny.edu

Professor: Luis A. Anchordoqui **PHY-307**

Calendar

Module 1: Analytic functions	·Lecture 1 08 / 27 / 2020 ·Group Discussion. 09 / 01 / 2020
Module 2: Integration in the Complex Plane	·Lecture 2. 09 / 03 / 2020 ·Group discussion. 09 / 08 / 2020
Module 3: Isolated Singularities and Residues	·Lecture 3. 09 / 10 / 2020 ·Group discussion. 09 / 15 / 2020 & 09 / 22 / 2020
MIDTERM 10/ 01/ 2020	
Module 4: Elements of Linear Algebra	·Lecture 4. 09 / 17 / 2020 ·Group discussion. 10 / 06 / 2020
Module 5: Initial Value Problem (Picard's Theorem)	·Lecture 5. 09 / 24 / 2020 ·Group discussion. 10 / 13 / 2020
Module 6: Initial Value Problem (Green Matrix)	·Lecture 6. 10 / 08 / 2020 ·Group discussion. 10 / 20 / 2020
Module 7: Boundary Value Problem (Sturm-Liouville Operator)	·Lecture 7. 10 / 15 / 2020 ·Group discussion. 10 / 27 / 2020
Module 8: Boundary Value Problem (Special Functions)	·Lecture 8. 10/ 22 / 2020 ·Group discussion. 11 / 03 / 2020
MIDTERM 11 / 24 / 2020	
Module 9: Fourier Series and Fourier Transform	·Lecture 9. 10 / 29 / 2020 ·Group discussion. 11 / 10 / 2020
Module 10: Hyperbolic Partial Differential Equation (Wave equation)	·Lecture 10 11/ 05 /2020 ·Group discussion 11 / 17 / 2020
Module 11: Parabolic Partial Differential Equation (Diffusion equation)	·Lecture 11 11/ 12 /2020 ·Group discussion 12 / 01 /2020
Module 12: Elliptic Partial Differential Equation (Laplace equation)	·Lecture 12. 11 / 19 / 2020 ·Group discussion 12 / 03 / 2020
MIDTERM 12 / 08 / 2020	
Final 12/15/2020	

Students who participate in this class with their camera on or use a profile image are agreeing to have their video or image recorded solely for the purpose of creating a record for students enrolled in the class to refer to, including those enrolled students who are unable to attend live. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live.

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Professor: Luis A. Anchordoqui **PHY-307**

Academic integrity is acting with honesty, respect, and responsibility in learning and in research. It is a moral code that binds us to do the right thing even when no one is looking.

Academic integrity is essential to any course, including this one _____. Students may fail to exhibit integrity by cheating, plagiarizing, obtaining unfair advantage, or falsifying records. In so doing, they hurt themselves, because they do not learn the material sufficiently and move on to later courses and careers as impostors, assumed to have skills they do not yet possess. They hurt their classmates, because they cheapen their hard-won accomplishments and disrupt the class. And they hurt future students, because the reaction to cheating will be to create ever stricter testing conditions.

Examples of academic dishonesty include but are not limited to those shown at http://lehman.smartcatalogiq.com/2019-2021/Undergraduate-Bulletin/Academic-Services-and-Policies/Academic-Integrity. For example, cheating on an exam includes, but is not limited to: Consulting with others regarding the exam while it is ongoing (this includes tutors, classmates, people who took the class before and family members etc.) and posting exam questions online for others to answer while the exam is ongoing, and including posting exam questions to online tutoring services such as Chegg. For online or hybrid courses, academic dishonesty also includes communicating in any form electronically or otherwise during an exam, sharing answers with peers electronically, or sharing screenshots of exam questions. Copying and pasting answers from the internet and not writing in own words or paraphrasing another's written statements. Additional rules may apply to specific exams. If so, they will be listed in the instructions for the exam.

Academic dishonesty is a very serious issue and will not be tolerated for any lecture, lab, or research activity.

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Cheating on an exam in this course: Should a student exhibit academic dishonesty, the instructor will inform the student of the suspicion, charges, and sanctions in writing. Any form of academic dishonesty will result in an F for the course, and a report to the College's Academic Integrity Officer, regardless of whether the cheating materially affected the score of the student in question.

Your pledge: To indicate that you understand academic integrity is central to the success of this course and your future success, you will be asked either to write out an honor statement during each exam or to confirm the receipt of this statement that has been approved and sponsored by the School of Natural and Social Sciences of Lehman College.

"I, _____ understand that academic integrity is central to the success of myself and others during this and future courses. The work I present here in this exam/lab/homework is my own and is in my own words. I declare that I have fulfilled my responsibility as an honest student, and the work presented here is true representation of my ability in this course."

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