**New York City College of Technology**

**The City University of New York**

**Physics Department**

**PHYS 1002ID SYLLABUS**

**An Introduction to the Physics of Natural Disasters**

**Fall 2020 Online Course**

**Lectures:** Instructor, Mr. Abdou Bah

Days: Tu, Th: 4:00 PM – 5:40 PM

**Laboratories:** Instructor, Mr. Abdou Bah

Days: Tu, Th: 4:00 PM - 5:40 PM

**Online Office Hours:** Tu, Th: 2:00 PM – 3:00 PM, and by appointment.

Office hours and classes will be held in the same virtual classroom on Blackboard.

**Email**: [ABah@citytech.cuny.edu](mailto:ABah@citytech.cuny.edu)

**Course Description**

Welcome to PHYS 1002ID, one of the most relevant and revelatory courses you will ever take. This introductory course for non-science majors focuses on natural disasters and the dynamic Earth processes that control them. The course integrates the principles of geology, meteorology, climatology, oceanography, and astronomy to provide rudimentary understanding of Earth System Science. Students learn about the nature, causes, risks, impacts, and prediction of natural disasters including hurricanes, earthquakes, volcanoes, tsunamis, and climate change. Laboratory exercises are incorporated with class work to illustrate and supplement the lecture material.

This is a **synchronous course.** Students need to be in the online class during the class time.

**Number of Hours and Credits:** 4 class hours, 3 credits

**Grading Policy**:

A student’s course grade will be determined from in-class exams, homework, lab reports, and group presentations. The final grade will be based on a weighted average of the grades from the exams, the homework, the reports, and the group presentations as follows:

First Exam: 15 %

Second Exam: 15 %

Homework: ClimateYou Blogging and Discussion Board Postings 20%

Lab Reports: 10%

Final Exam: 25%

Oral Group Presentations 15%

**Textbook:** ***NATURAL DISASTERS*** by PATRICK L. ABBOTT, 10th EDITION, McGRAW-HILL, 2017

**Lab Manual:** Will be provided by the Physics Department

**PHYS 1002ID: An Introduction to the Physics of Natural Disasters**

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|  | **Lecture Topics** | **Laboratories and Exams** | **Chapters** |
| 1 | Natural Disasters and the Human Population | Introduction | 1 |
| 2 | Internal Energy and Plate Tectonics – Density Stratification, Isostasy, Radioactivity, Magnetism | Plate Tectonics | 2 |
| 3 | Earthquake Geology and Seismology – Faults, Elastic Rebound Theory  *Guest Lecture by: Dr. Illya Azaroff*  *(Architecture Department)* |  | 3 |
| 4 | Plate Tectonics, Earthquakes, and Volcanoes – Subduction zones, Earthquake wave theory, Plate Collision | Seismic Waves and locating Epicenters of Earthquakes | 4, 5 |
| 5 | Volcanic Eruptions: Plate Tectonics and Magmas – Viscosity, Temperature, Density, Force  *Guest Lecture by: Ms. Maria Ivanova*  *(Ph.D. Candidate, Department of Engineering and Environmental Science, College of Staten Island)* | ***Exam #1*** | 6, 7 |
| 6 | Tsunami versus Wind-Caused Waves – Wave: frequency, period, length, amplitude, speed |  | 8 |
| 7 | External Energy Fuels Weather and Climate – Radiation: Planck’s Law, Stefan-Boltzmann Law, Wien Displacement Law. Thermodynamics: Latent Heat, Energy Transfer, Adiabatic Processes, General Circulation of the Atmosphere and the Oceans, Satellite Remote Sensing  *Guest Lecture by Dr. Viviana Vladutescu*  *(Electrical Engineering and Telecommunication Technologies Department)* |  | 9 |
| 8 | Hurricanes - Thermodynamics and Heat Engines | Tsunami Generation, Propagation, Impact | 10 |
| 9 | Climate Change – Climate models  *Guest Lecture by Dr. Valerie Sloan*  *(National Center for Atmospheric Research)* | **Exam #2** | 11 |
| 10 | Tornadoes, Lightening, Thunderstorms – vorticity, electricity, super cell, thunder clouds | Global Warming and Climate Change Impacts | 12 |
| 11 | Floods – water balance equation, evapotranspiration, overland and subsurface flow, unit hydrograph  *Guest Lecture by: Dr. Hamidreza Norouzi*  *(Civil Engineering Technology Department)* |  | 13 |
| 12 | Fires | Hydrograph and Flood Plain Analysis | 14 |
| 13 | Mass Movements – gravitational force, gravity, energy, force, work, power, and heat, slope stability, cohesion, debris flow |  | 15 |
| 14 | Impacts with Space Objects – Earth’s orbit, extraterrestrial debris, asteroids, comets, impact craters | ***Oral Presentations*** | 16 |
| 15 | ***Final Exam*** |  |  |

***Revised 8/25/2020***

**Attendance and Participation Policy**

Any student who has exceeded the 10% absence/lateness policy will receive a grade reduction for that portion of the course (lecture & or lab). In addition to real-time class discussion, you are expected to contribute regularly to the conversations on the Discussion Board. Discussion Board Postings will be graded! Along with grouped presentations (student groups will have rotated group leadership) and along with responses to specific questions (from instructor and peers) during the virtual class, Discussion Board postings are part of the course’s interactivity feature. The Discussion Board will be a place to pose questions and to comment on questions that others (including the instructor) have posed. Please, therefore, check the Discussion Board area of the course’s Blackboard site every day and respond to the discussion questions with solid, thoughtful posts (not just “ok” or “I agree”). Each week’s questions will be posted by Tuesday morning. Your discussion responses must be posted by midnight on Sunday in order to count for that week. If there are questions, please make contact via email.

**Interdisciplinary Learning Outcomes**Students will be able to:

* Purposefully connect and integrate across-discipline knowledge and skills to solve problems
* Synthesize and transfer knowledge across disciplinary boundaries
* Comprehend factors inherent in complex problems
* Apply integrative thinking to problem-solving in ethically and socially responsible ways
* Recognize varied perspectives
* Gain comfort with complexity and uncertainty
* Think critically, communicate effectively, and work collaboratively
* Become flexible thinkers

**Examinations:**

All exams will take place fully online under the direct supervision of the instructor. Students are responsible for knowing all material covered in reading assignments, handouts, lecture and laboratory. Students are also responsible for knowing information from reading assignments regardless of whether it has been covered during class sessions or not.

**Academic Integrity Policy:**

For City Tech online class, students are expected to follow the College’s Academic Integrity policy that is found at:

<http://www.citytech.cuny.edu/academics/docs/academic_integrity_policy.pdf>

In general, students are not expected to:

* Cheat;
* Plagiarize, that is, use another person’s words or ideas as your own without proper documentation;
* Collaborate with others to solve test problems unless specifically requested in an assignment or discussion;
* Permit other students to login to your Blackboard account.

**Computer/Technology Needs**:

Minimum online computer/technology requirements include:

1. Access to and be able to use the Chrome, Firefox, Safari, or Internet Explorer browsers. A complete list of versions supported is found here:

<https://en-us.help.blackboard.com/Learn/Student/Getting_Started/Browser_Support>

1. Student’s City Tech email account. The college provides an email account to all students.
2. Access to a computer with at least 256 MB RAM and an Internet connection via a 56k modem or, ideally, the college T1 line.

**Online Etiquette:**

Online posts and responses must be done professionally with respect for others, with courtesy, with dignity, and with decency. Inappropriate behavior of any kind will not be tolerated and will adversely affect your grade. Please review the etiquette guidelines prior to signing on:

<http://catalog.sps.cuny.edu/content.php?catoid=2&navoid=205>

**How to Access & Navigate Blackboard:**

1. Visit the open student computer lab in the General Building, sixth floor, room G600.

The phone number for the lab is (718) 254-8565.

1. Refer to Websupport 1 for a “Beginners Guide to Blackboard.” To access this site:
   1. Go to the City Tech Home Page
   2. Scroll down, and on the left-hand side of the page, click on “additional resources.”
   3. Scroll down to “Websupport 1.”
   4. Click on “Instructional Technology.”
   5. Scroll down to “Beginners Guide to BlackBoard,” and click.
   6. Click on “Beginners Guide to BlackBoard Course Info.”

Please be aware that helpful and extensive learning tutorials are located directly in Backboard.

**Announcements** are the entry point. They tell everything one would typically hear at the beginning of a class. In the virtual classroom, announcements should be read each time the student logs on since notices, assignments, and updates will be posted there regularly.

**Staff Information** is where information (phone, email, office location and so on) about the instructor will be found. The online classroom is open 24 hours a day, 7 days a week. Please, therefore, do not hesitate to reach out with questions; in general, responses will be given within 24 hours. For open discussions, please post to the Discussion Board.

**Course Information** is where information about course syllabus, course calendar, grading policies, browsers, software and plugins is found.

**Course Documents** is where information about assigned readings, "handouts," checklists, slides, lecture notes and other course related information is found.

**Assignments** is where each day's assignments (and due dates) will be posted.

**Communication** is where the tools for sending email to other members of the class and for participating in electronic discussions either with the class as a whole and within a smaller group will be mentioned.

**Discussion Board** is where questions, comments, and responses to peers’ questions will be posted.

**Exams/Tests/Assessment** is where quizzes, tests, exams and any additional assessments will be found.

**Student’s FAQ** is where tips about how to work online are given. Sample Q/A include: “how to change passwords” and “how to navigate this course”.

**External Links** is where links to websites with related course material are found.

**Tools** is where guidance for updating personal information, creating Home Pages (on this site), checking grades, and exchanging word processing files with classmates and with the instructor via the Digital Drop Box is provided.