Electricity and Magnetism I (PHY 321)

Fall 2024

Scott N. Walck

Course Information

Contact Information

- Instructor: Scott N. Walck
- Preferred names: Scott, Dr. Walck, Prof. Walck (I prefer not to be called by my unadorned last name.)
- Pronouns: He, his, him
- Office: Neidig-Garber 223
- Office Phone: 717-867-6153 (messages reach me by email)
- Email: `walck@lvc.edu`
- Web page: `http://quantum.lvc.edu/walck/`

Email is the best way to contact me. Many questions and issues can be solved over email.

Office Hours

I will be in my office

Monday	11:00–12:00
Tuesday	12:00– 1:00
Tuesday	1:00– 2:00
Wednesday	11:00–12:00
Friday	11:00–12:00

during the course of the Fall 2024 semester.

If you need to meet at a different time, please send me an email to set that up. You can drop by my office any time to see if I am there. If I'm there, we can chat.

Course Description

This is the first in a two-course sequence of electromagnetic theory required in the physics major at Lebanon Valley College. PHY 321 is a 3-credit course. PHY 321 contains 3 contact hours of instruction per week.

What role does electromagnetic theory play in physics? This is a good and important question. We know that electricity is part of physics, but maybe it seems that it's a peripheral part, a sort of side topic like the theory of sound. **This is completely wrong.**

Electromagnetic theory is central to physics. At the center. At the core. Why?

Electromagnetic theory describes one of the four fundamental forces of nature.

Today's physicists believe that all known interactions come down to four forces. These are

- The Strong Force
- The Electromagnetic Force
- The Weak Force

- Gravity

What about friction and tension? They are electromagnetic at a micro level. All of chemistry is based on the electromagnetic force. That doesn't mean that if you learn electromagnetic theory, you will know everything about chemistry. But everything we know about chemistry can be traced back to some electromagnetic effect. Chemical bonding is all about the electromagnetic forces between elementary particles. Chemistry deserves to be its own subject with its own ideas because the electromagnetic interactions get very complicated, and it's very difficult to predict, based on electromagnetic ideas alone, how molecules are going to interact, react, and behave.

At a microscopic (some would say fundamental) level, sound is electromagnetic in nature. Sound is a pressure wave caused by the interaction of atoms or molecules in a gas, liquid, or solid. These atoms and molecules are interacting via electromagnetic forces.

Electricity holds atoms together! No electricity, no atoms. No atoms, no life. Electricity is fundamental.

Electromagnetic theory serves as the model for modern field theories of elementary particles.

EM theory is the prototypical example of a *field theory*, that is, a theory whose important quantities depend on space or spacetime. Modern theories of elementary particle physics are based on quantum field theories, the quantum versions of theories like electromagnetic theory. In fact, electromagnetic theory does not need to be modified to incorporate quantum ideas. The Maxwell equations are still the Maxwell equations in the quantum version of electromagnetic theory, but the mathematical objects like electric field and magnetic field are interpreted differently, as operators rather than numbers or vectors. The quantum version is quite a bit more complex, but it starts with the same Maxwell equations that we will study in this course in the classical version of the theory.

Electromagnetic theory obeys the laws of special relativity, even though it was developed 40 years earlier.

Einstein wrote about special relativity in 1905. Maxwell wrote his equations in 1865. Maxwell's equations did not need to be modified at all with the advent of special relativity. They were already relativity-ready. The same cannot be said for the classical theories of mechanics, like Newtonian gravity, or even some versions of Newton's second law.

It seems that electromagnetic theory was onto something fundamental about the universe.

Electromagnetic theory is the earliest theory that is still part of our current best understanding of the universe.

Newtonian mechanics is incredibly useful, and beautiful, but it cannot be said to express our current best ideas about the universe. The 20th-century ideas of quantum mechanics and relativity have each led to newer theories that are slightly different from Newtonian mechanics, although they give essentially the same answers for slow massive things.

Electromagnetic theory, on the other hand, passed unchanged through the 20th-century quantum and relativity revolutions.

Electromagnetic theory unites electricity, magnetism, and light into a single theory.

Light is an electromagnetic wave! Light is a wave of electric and magnetic fields. Electromagnetic theory is three theories in one. It's been known since the early 1800s, when Oersted found an electric current can deflect a compass needle, that electricity and magnetism are related. By 1865, Maxwell understood that they belong as part of a single theory, and that the single theory interprets light as an electromagnetic phenomenon.

Here are four connections between electricity and magnetism.

- Electric current produces magnetic field (Oersted's discovery, 1820).
- Changing magnetic field produces electric field (Faraday's discovery, 1831).
- Changing electric field produces magnetic field (Maxwell's discovery, 1865).
- Light is a wave of electric and magnetic fields (Maxwell's discovery, 1865).

Physicists enjoy when a small number of ideas are responsible for a vast array of phenomena. Maxwell's reduction of electric, magnetic, and optical phenomena into a single theory seems like a great simplicity from a certain perspective. (However, the single theory is not simple from an ordinary human perspective. It's only simple from a mathematical perspective. We might say the theory is profoundly simple from the perspective of sophisticated mathematics.)

Brief Outline

1. Mathematics and Vector Calculus
2. Electrostatics
3. Magnetostatics

Learning Objectives

It is expected that students will

1. describe physical situations using the mathematical language of scalar and vector fields
2. interpret the force between charged particles in terms of electric and magnetic fields
3. apply Maxwell's electromagnetic theory to specific physical situations
4. calculate the electric field produced by a charge distribution
5. calculate the force on a charged particle moving in an electromagnetic field
6. compute gradients, divergences, and curls using both analytical and numerical techniques
7. evaluate line, surface, and volume integrals using both analytical and numerical techniques
8. explain the relationships between electricity and magnetism
9. write expressions in a formal language that are meaningful to other people *and* to the computer

Textbook

The textbook for the course is *Learn Physics with Functional Programming*, by Scott N. Walck, No Starch Press (2023), ISBN 978-1-718-50166-9. This book contains numerical and computational techniques in electromagnetic theory. I will refer to this book as LPFP.

There are several ways to read a textbook.

- You can skim a portion of the book to get a sense of what the portion is about. You read quickly and get a rough idea of what's happening. Let your eyes see each line, but keep moving for maybe a whole page. Then pause and see if you can say or write what the page was roughly about.
- You can do a close reading of a portion of the book. In a close reading, you read every word. You keep asking yourself whether each sentence makes sense. You identify the words and sentences that you don't understand. You read slowly.
- You can read the introductions and summaries. LPFP has an introduction and a summary for each chapter. Take advantage of these to understand what the chapter is getting at.
- You can read the table of contents. Use the table of contents to understand how the little parts fit into bigger parts.

I believe the textbook is worthy of close reading (not every book is), meaning that your learning improves by spending time with the book, that a slow reading is helpful, and that a second and third reading are likely to show you more than you got the first time.

While I believe the book worthy of close reading (I wouldn't have assigned it as a required textbook if I didn't), I don't expect that you will always have the willingness or ability to read it closely. My job is to explain things to you, to help you read the book, to let you know when some things are more important than other things, to try to predict what will be difficult for you, and to try to convince you that this is one of the coolest subjects in the universe (which it just objectively is).

If one extreme is you doing a close reading of every reading assignment, another extreme would be me not asking you to do any reading and just explaining everything to you. If I was an entertaining figure, you might want this, but in any case we do not have the time for it. I cannot explain everything I want you to know and show you every skill I want you to have in 42 50-minute periods. So you need to do some learning on your own, some learning in class, and some learning in office hours or meeting with me. We might think of this as a three-legged stool of learning. We need all three parts.

Our goal then is to take a middle path between these two extremes. I will explain the things I think are most important and most difficult. The reading will help you understand a lot of things I don't have time to explain, and you will ask questions about anything you are not understanding. You will decide how and when to skim, read closely, and reread based on you own assessment of how well you understand something and how well you need to understand it. I will do my best to set clear expectations of what I want you to know and what I want you to be able to do.

Computers

Why should we study how to get the computer to do electromagnetic theory? Computers weren't around when EM theory was invented. EM theory has been taught for many decades

without computer involvement. It's going to take some effort to figure out how to use a computer in a helpful way. So why do it?

Most physical situations are not exactly solvable.

The traditional tools of algebra, calculus, and differential equations only get us so far. They can't solve most problems. The theory tells you how to make (partial) differential equations, but you can't solve them exactly. We don't know how to write down functions that exactly satisfy the differential equations. Traditionally, you spend a lot of time studying situations that *can* be solved exactly, and then come up with tricks to approximate the other situations that can't be solved exactly.

So, there are the exactly solvable problems, and then there are all the rest. We need methods that allow us to approximate the solutions to all these other problems.

Examples from mechanics:

- The harmonic oscillator is exactly solvable, but the pendulum is not.
- The two-body problem is exactly solvable, but the three-body problem is not. The theory still gives equations for the three-body problem. It's not the theory that breaks down. It's that no one knows how to solve the equations exactly.

Examples from EM theory:

- The electric field inside a capacitor with infinite plates is exactly solvable, but the electric field inside a capacitor with finite plates is not.
- The magnetic field produced by a circular loop carrying current is exactly solvable along the axis that runs through the center of the circle (perpendicular to the plane of the circle), but not exactly solvable anywhere else.

There are some simple, standard approximations, that are known to be reasonably good, and don't involve tricks. The problem is that they require an enormous number of exceedingly boring computations. An here is where the computer comes to the rescue. Just by being able and willing to do an enormous number of simple, boring computations, the computer can give us good, approximate solutions to many problems.

Why wouldn't we want to use modern tools?

Why not use all the tools at our disposal, and in particular the computer, to help us solve our problems? Computers can do things that calculators can't. I don't predict the death of the pocket calculator, but who knows? The slide rule is, if not dead, an eclectic tool used by very few people.

Physics societies like the American Association of Physics Teachers (AAPT) have been encouraging physics teachers to include more computer techniques in their courses.

Programming is a valuable skill in itself.

Just like mathematics is a valuable skill in itself. Knowing something about programming is useful for getting a job, but it's also useful for organizing your thinking. Writing code is not just about getting the computer to do something. It's also about expressing ideas in

a formal language in a way that makes sense to people. And so, for the same reason that essay writing can help you clarify your ideas about art or politics, code writing can help you clarify your ideas about physics.

The language of the code can help you understand the theory.

Haskell's types and higher-order functions are particularly useful in helping us understand a theory.

So, it's not just that we want to do all the ugly problems, or the real problems, or the practical problems. We do want to be able to do these, but using the computer can actually help us understand the theory itself. It can give us real insight.

Exams

An exam is an opportunity to demonstrate what you know about physics. There are three regular exams and one final exam in this course. The dates of these exams are listed later in the syllabus. Each exam consists of about three problems.

An exam is an individual endeavor in which you write and submit *your* ideas, *your* solutions, *your* guesses, and *your* work.

During an exam,

- you *may* consult any notes that you have made during the course, whether in class or outside of class,
- you *may* consult the textbook, and
- you *may* use any calculator, as long as it cannot communicate with other machines or people.

During an exam,

- you *may not* communicate with other people,
- you *may not* share a calculator with anyone else,
- you *may not* use the notes of other people, and
- you *may not* search for help on the web or anywhere else.

There will be portions of exams in which we will use a computer. During those portions, you may not use the computer to communicate with other people (exceptions: you can send me an email and use Canvas to submit your work), you may not search for help on the web or anywhere else, and you may not engage in any activity which violates the spirit of an exam being a one-person activity designed to probe what you know and what you can do. We will talk about the details closer to the first exam.

If you have any questions about whether a particular resource is allowed or not allowed during an exam, please ask me.

At the end of the semester, we will have a comprehensive final exam.

You should not think that office hours are only a time for people that need remedial help. Coming to office hours is helpful for people at all levels. Nobody is too advanced or too far behind to benefit from coming to office hours. A typical student in this class probably cannot get a high grade without coming to office hours, at least from time to time. Even if you don't have specific questions, I can suggest problems for you to work on that will deepen your understanding, putting you in a better position for exams.

Homework

The homework is the centerpiece of this course. It is in doing the homework problems that you will begin to understand electromagnetic theory. Give the homework problems the time they deserve. I expect that many of the problems I am asking you to work will take about one hour each. I would not ask you to do these problems if I didn't believe that the process was worth your time. You cannot succeed with this subject if you wait until the day before the homework is due to start. Start the homework a week before the due date by reading the problems and seeing if you can do any of them. Come to me with questions, or if you get stuck.

You may work together on the homework, talking about how to solve the problems, but you must write your homework solutions independently. Do not copy homework solutions from the web or from your classmates. Copying another person's homework solutions is an act of cheating and plagiarism. Submitting your own work for the homework will cause you to learn electromagnetic theory. Everything that you write in your homework solutions you should be able to explain to me if I were to ask. This does not mean that your homework needs to be perfect, only that it must have come from your mind.

Sometimes people like to work together on a white board. This can be a good way to work, but it has a problem. The problem is that once people think they have the answer, everybody copies what's on the white board. This is a problem, because does everybody really understand what's on the white board? Maybe. Maybe not. Here is my suggestion if you want to work together on a white board. After you get to the place where you think the white board has the best answer, stare at it. Does it make sense to you? Could you remember it? Could you remember the rough steps? Then, don't copy anything from the white board. Erase it. Try to reconstruct what was there on your own paper. Better yet, try to improve on what was there by writing it in a more organized way. Maybe it seems crazy to you to do this, but doesn't it seem to be in the interest of learning? If multiple people copy from the same whiteboard, I will see the same thing on their submissions, and I don't want to see that. If you give these problems some individual thought (which is a wonderful way to learn), even after you've talked with others about how to do it, you will not write the same thing that anyone else writes. There will be similarities, but it won't be the same. So please do whatever you need to do to ensure that I don't see the same thing on multiple submissions. Learning is hard. Cheating is easy. I know your time is limited. You have me a resource. Ask me for help instead of cheating.

If you can't finish some of the problems before the due date, turn in what you have done. It is still worth trying to do the remaining problems, because they all have a purpose in learning electromagnetic theory. If you know in advance that you will have trouble finishing the homework by the deadline, come and talk to me.

Class Participation

A portion of your grade is determined by class participation. Obviously, attendance is a prerequisite for participation in class.

We will take turns being scribe for the class. When it is your turn to be scribe you write down the ideas that people in the class have for how to do a problem. You are not expected to do the problem on your own, but you can include your own ideas in what you write.

If you attend every class, and participate by scribing when it is your turn, you will have a perfect score for this area. If you need to miss a class, see me in advance and I'll give you an alternative assignment.

Grading

Your grade will be determined by a weighted average as indicated in the table below.

Exams	45%
Homework	30%
Class Participation	10%
Final Exam (comprehensive)	15%

Your letter grade for the course is determined by the weighted average. The minimum weighted average (out of 100) required for each letter grade is indicated below.

A	93
A-	90
B+	87
B	83
B-	80
C+	77
C	73
C-	70
D+	67
D	63
D-	60
F	0

Make-up Work and Extra Credit Policy

Homework and exams can only be made up in the event of serious circumstances such as illness. There is no extra credit in this course.

Class Schedule

Date	**Topic**	**Read before class**
08/26	Welcome	
08/28	Vector Algebra	
08/30	Haskell Calculator	LPFP 1
—		
09/02	Functions	LPFP 2
09/04	Types	LPFP 3
09/06	Derivatives in Haskell	LPFP 4
—		
09/09	Vectors	LPFP 10
09/11	Spherical Coordinates	LPFP 22, pp 421–426
09/13	Cylindrical Coordinates	LPFP 22, pp 427–433
—		
09/16	Fields	LPFP 22, pp 433–446

09/18	Gradient	
09/20	Continuous Charge	
—		
09/23	Continuous Charge	
09/25	**Exam 1 (Differential Vector Calculus)**	
09/27	Curves	LPFP 23, pp 449–452
—		
09/30	Surfaces and Volumes	LPFP 23, pp 452–458
10/02	Line, Surface, and Volume Integrals	
10/04	The Fundamental Theorem for Gradients	
—		
10/07	No class (fall break)	
10/09	The Fundamental Theorem for Divergences	
10/11	The Fundamental Theorem for Curls	
—		
10/14	Charge distributions	LPFP 24, pp 461–466
10/16	Charge distributions	LPFP 24, pp 466–471
10/18	Electric Field	LPFP 25, pp 473–483
—		
10/21	E from point charges	
10/23	Continuous distributions	LPFP 25, pp 483–494
10/25	Continuous distributions	
—		
10/28	Scalar integrals	LPFP 25, pp 494–502
10/30	**Exam 2 (Integral Vector Calculus and Coulomb's Law)**	
11/01	Gauss's Law	
—		
11/04	Applications of Gauss's Law	
11/06	Electric potential	
11/08	Electric potential	
—		
11/11	Electrostatic Energy	
11/13	Current distributions	LPFP 26
11/15	Lorentz Force Law	
—		
11/18	Continuity Equation	
11/20	Biot-Savart Law	LPFP 27
11/22	Biot-Savart Law	
—		
11/25	**Exam 3 (Gauss's Law, Biot-Savart Law)**	
11/27	No class (Thanksgiving break)	
11/29	No class (Thanksgiving break)	
—		
12/02	Ampere's Law	
12/04	Ampere's Law	
12/06	Review	
—		

12/13 **Final Exam (Cumulative)** 12:30–3:00 pm

Course Objectives Alignment to Program Goals and Assessment of Course Objectives

Program Goal	Course Objective	Assessment
Graduates from our program will have a working understanding and knowledge of fundamental areas in physics.	interpret the force between charged particles in terms of electric and magnetic fields	Exams 2, 3, and Final Exam
	apply Maxwell's electromagnetic theory to specific physical situations	Final Exam
	calculate the electric field produced by a charge distribution	Exam 2 and Final Exam
	calculate the force on a charged particle moving in an electromagnetic field	Exam 3 and Final Exam
	explain the relationships between electricity and magnetism	Final Exam
Graduates from our program will have a working understanding and knowledge of mathematics along with computational skills necessary for advanced work in physics/engineering.	describe physical situations using the mathematical language of scalar and vector fields	Exam 1

College-Wide Course Policies

RESPONDUS or EXAMSOFT POLICY

In this course, you may be asked to use a custom browser that locks down the testing environment within the Canvas learning management system. While using these programs, your instructor may require you to activate the video camera and microphone of your computer while completing the exam. Students who are not willing to provide the requested video and audio feeds may ask to take the exam using an alternative proctoring method. Students may arrange for the exam to be proctored at a professional testing center such as Sylvan Learning Centers. The student is responsible for finding the testing site and must pay any fees associated with testing. The Alternate Proctoring Request form can be obtained by contacting Kristen Shutter at `shutter@lvc.edu` or by phone at 717-867-6028.

EXPECTATIONS FOR STUDENTS IN FACE-TO-FACE CLASS SESSIONS

Students participating in face-to-face class sessions must adhere to the guidelines put forth in LVC's Community Covenant (`http://wordpress.lvc.edu/wordpress/lvcforward/2020/07/09/community-covenant/`). To facilitate contact tracing, students will be given assigned seats for the semester.

POLICY ON RECORDING CLASS SESSIONS

Audio and/or video recordings of the class sessions may be made by the College and/or by students who have been authorized by the LVC Center for Accessibility Resources to record classes as an accommodation for a disability. By participating in the class, all students consent to being recorded for these purposes. Any other recordings of class sessions are not permitted. Students participating in on-line courses are asked to respect the privacy of those participating in the class by ensuring that class sessions cannot be overheard by those who are not enrolled in the course.

Academic Honesty Policy

Any student who submits work that is in violation of the academic honesty policy will be subject to the penalties described in the College Catalog and outlined in LVC's Academic Honesty Policy. Lebanon Valley College expects its students to uphold the principles of academic honesty. Violations of these principles will not be tolerated. Students shall neither hinder nor unfairly assist the efforts of other students to complete their work. All individual work that a student produces and submits as a course assignment must be the student's own.

Cheating and plagiarism are violations of the academic honesty policy. Cheating is an act that deceives or defrauds. It includes, but is not limited to, looking at another's exam or quiz, using unauthorized materials during an exam or quiz, providing unauthorized material or assistance to another student, colluding on assignments without the permission or knowledge of the instructor, and furnishing false information to receive special consideration, such as postponement of an exam, essay, quiz, or deadline of an oral presentation.

Plagiarism is the act of submitting as one's own the work (e.g., the words, ideas, images, compositions, or other intellectual property) of another without accurate attribution. Plagiarism can manifest itself in various ways: it can arise from sloppy, inaccurate note-taking; it can emerge as the incomplete or incompetent citation of resources; it can take the form of presenting passages or work prepared by another as one's own, whether from an online, oral, or printed source. It may also take the form of re-using one's own previously submitted work (such as a paper written for a different class) without the current instructor's knowledge and permission.

A student is culpable for violations of the academic honesty policy, as outlined above, when caused by either academic negligence or academic dishonesty. An act of academic negligence is when a student engages in behaviors outlined above through irresponsible ignorance or carelessness. Acts of dishonesty involve the intent to deceive or mislead. Initially, the instructor will make the determination that a violation of the policy may have occurred.

Students who take part in violations as described above are subject to a meeting with the Associate Provost of Undergraduate Education, who has the authority to take further action, up to and including expulsion from the College.

UNICHECK POLICY

In this course, you may be asked to submit some or all of your assignments for review by LVC's online plagiarism service, Unicheck. This service will compare the content of your work to content found on the internet and several proprietary databases. Any work submitted to this service may become part of the service's permanent collection of submitted papers. After your work is submitted, the service will generate an originality report, which will be sent to your instructor. Any student who submits plagiarized work will be subject to the penalties outlined in LVC's Academic Honesty Policy found in the Student Handbook and the College Catalog.

END OF TERM COURSE EVALUATIONS

Most courses at the College utilize a course evaluation system called EvaluationKIT. Near the end of the term, you will have the opportunity to evaluate the course in a number of key areas: learning environment, instructor performance, overall course structure, progress on relevant course objectives, and Constellation learning outcomes (if they apply). The faculty have approved a set of common questions that students will respond using an agreement

scale. Please note that quantitative survey results and comments are used for course and instructor improvements and to indirectly measure the progress on relevant student learning objectives.

POLICIES REGARDING ACCESSIBILITY RESOURCES

Individuals with disabilities are guaranteed certain protections and rights of equal access to programs and activities under Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Therefore, Lebanon Valley College recognizes the responsibility of the college community to provide equal educational access for otherwise qualified students with disabilities.

In-Person and Online Courses: Any student who needs accommodations is invited to provide letters from the Center for Accessibility Resources and discuss accommodations with me.

Any student who feels they may need accommodations based on a documented disability or other condition that may affect academic performance should: contact The Center for Accessibility Resources, located in the Lebegern Learning Commons — Mund Suite 002. Students may schedule an appointment by calling 717-867-6028 or emailing `hannafor@lvc.edu` to determine if accommodations are warranted and to obtain an official letter of accommodation.

Assistive Technology is available to enhance your academic skills. The Center for Accessibility Resources, located in the Lebegern Learning Commons—Mund Suite 002, offers educational software and personal assistive devices for short-term loans. Available assistive devices include LiveScribe pens, mini iPads, digital recorders, headphones, and adaptive keyboards. Our student coordinator is available to meet with students throughout the semester to suggest devices and/or software aligned to individual student needs.

If a student believes that appropriate accommodations are being denied, the student may file a grievance. Procedures for filing grievances may be found at `www.lvc.edu/offices-directories/center-for-accessibility-resources`.

STATEMENT ON INCLUSIVE EXCELLENCE

LVC is a community of inclusive excellence. We affirm the rights of all persons to a superior educational experience that is characterized by respect for others. As such, this class and all classes at LVC, are places where our core values of inclusiveness, civility and appreciation of difference are affirmed.

Policy on Names and Pronouns

Lebanon Valley College is committed to fostering an environment of inclusion and support, which includes honoring all its members' forms of self-identification. This policy supports the use of self-identified first names and pronouns for students, faculty, staff, friends, and alumni who wish to provide them. Many members of the LVC community may use names other than their legal names to identify themselves. If the use of this different name is

not for misrepresentation, LVC acknowledges that a chosen name may be used wherever possible. The name will be recorded and used except where the legal name is required. Be aware that LVC is implementing a new process in which students can specify if their chosen name is for internal use only or for both internal and external use. Students may see more information and update their information via the student information form accessible through MyLVC.

Although students, faculty, staff, friends, and alumni are free to determine the name and pronoun they wish to be known by, the College reserves the right to deny a name and pronoun if it is used inappropriately.

Gender pronouns are those pronouns that members of the community use to represent themselves. Gender pronouns can include, but are not limited to, he/him/his, she/her/hers, they/them/theirs, etc. Correctly using a person's pronoun is one of the most basic ways to show respect for a person's gender identity.

Names and pronouns will be entered and accessible to members of the campus community. LVC expects all faculty and students to respect community members' names and pronouns as consistent with our dedication to inclusion and equity.

Statement of Policy Against Title IX Sexual Harassment

In compliance with Title IX, a federal law, Lebanon Valley College does not discriminate on the basis of sex in the education programs or activities that it operates. Title IX of the Education Amendments of 1972 (20 U.S.C. §1681, et seq.) and its implementing regulations (34 C.F.R. Part 106) prohibit discrimination on the basis of sex in education programs and activities . No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any Education Program or Activity receiving Federal financial assistance.

Title IX requires that colleges and universities maintain an environment free from sex discrimination for all faculty, staff, and students. Under Title IX, discrimination on the basis of sex includes Title IX Sexual Harassment, Sexual Assault, Domestic Violence, Dating Violence, and Stalking. Sexual harassment is also prohibited by Title VII of the Civil Rights Act of 1964 and by the state law.

Inquiries about the application of Title IX and its regulations may be referred to: Title IX Coordinator, Ann C. Hayes, associate vice president of human resources, Office of Human Resources - Humanities 108, `hayes@lvc.edu` Phone: 717-867-6416 Title IX web page: `https://www.lvc.edu/offices-directories/human-resources/title-ix/`
OR Assistant Secretary for Civil Rights, U.S. Department of Education, Office for Civil Rights, `ocr@ed.gov`, 1-800-421-3481.

Title IX makes it clear that violence, harassment, and any type of sexual misconduct based on sex and gender are civil rights violations. If you or someone you know has experienced violence, discrimination, or harassment, support is available through Counseling Services, Health Service, the Chaplain's office, and Title IX deputies. Please refer to the Student Handbook or the College Catalog for specific contact information.

HYBRID AND ONLINE INSTRUCTIONAL EQUIVALENCIES

The faculty of Lebanon Valley College approved guidelines on Equivalent Instructional Activities that will be used to substitute for face-to-face contact hour requirements for this online or hybrid course. These activities are clearly documented in this syllabus. For further details, please review the approved Equivalent Instructional Activities.

Policy on Student Success and Intervention

- THE CENTER FOR ACADEMIC SUCCESS

  Starfish is an online tool used at LVC that gives you the opportunity to connect with faculty and staff to cultivate your success. Through Starfish, you can submit concerns, access beneficial resources, connect with your Success Network, and receive updates on your academic progress. This tool also allows faculty and staff to recognize when you might need extra help and reach out to collaboratively resolve an issue. If you receive a Starfish Flag showing that someone has a concern, you will receive an email with a specific action plan to follow. Take that action and work with us to maximize your success.

- CARE Team

  At Lebanon Valley College, we want you to succeed in and out of the classroom. Administrators and faculty work together on the CARE Team to cultivate Confidence, Accountability, Resilience, and Engagement in every student. If a member of the LVC community is concerned about you for any reason (i.e. academic, social, or emotional issues), they will ask a CARE team member to reach out to you and work with you towards a solution. You should consider it your assignment to follow through and accept assistance from the appropriate source(s). Don't be afraid or hesitant to seek help from these individuals: supporting you is their job! Be proactive and take control of your success.

- The Center for Academic Success and Exploratory Majors

  Located in the lower-level of Mund College Center, the Center for Academic Success and Exploratory Majors serves to support, inspire, and cultivate student success. The key to performing well academically lies in frequently utilizing support services across campus; in fact, many of our top students utilize tutors to help prepare for exams, talk through challenging concepts, learn how to take effective notes, and more. For this reason, we staff peer tutors in almost all 100 and 200-level classes, including subject-specific writing conferencing. Students can request tutoring appointments through Starfish and the sessions serve as a place to connect with classmates, ask questions, and work on homework as well as drop-in writing support from 7pm-9pm, Mondays through Thursdays. If you would like to work with a tutor, please request a time using Starfish.

  In addition, the Center features academic success coaching, where staff members support students by designing and implementing a plan for academic success. These "coaching" sessions focus on developing effective time management, organizational, test-taking, critical reading, note-taking, and study skills, as well as learning healthy behavioral techniques like stress management and self-motivation. . For more informa-

tion on any of these services, visit the Center for Academic Success. To request an appointment, please email `findyoursuccess@lvc.edu`.

The Center also serves as the home on campus to Exploratory (undecided) majors. Professional staff advise students who are still determining their major/career path and support students who are in transition between majors as they determine their next steps.

Statement on Supporting Mental Health

Counseling Services

LVC cares about you and your mental health. We recognize that mental health support is vital to your growth as a student and individual. Stress, anxiety, depression, relationships, and problems with eating and sleep can adversely influence your academic performance. We want to help you be your best. A consultation with a professional counselor can help make a difference. Our professional counselors can assess your needs, help you build skills, and connect you to appropriate services. Students who start the counseling process earlier in the semester report the most significant improvement. All counseling services provided are free, completely confidential, and in no way connected to your academic record. I strongly encourage you to take advantage of this valuable resource. Please, contact Counseling Services at 717-867-6232 or `counselingservices@lvc.edu` and leave your contact information. We will return your call or email as soon as possible; please know that we do not check email after hours, on the weekends, or during vacations. Click here to explore all Counseling Services has to offer. If you experience an emergency, please call 911 in your local area or text 741741 (Crisis Text Line), or call 988 (Suicide & Crisis Lifeline) to request immediate assistance.

Notice of Non-Discrimination and Equal Opportunity

Lebanon Valley College does not discriminate on the basis of race, color, national origin, ancestry, religion/creed, pregnancy, sexual orientation, gender identity or expression, age, disability, genetic information, or veteran status in its programs and activities as required by the Americans with Disabilities Act of 1990, Section 504 of the Rehabilitation Act of 1973, Title VII of the Civil Rights Act of 1964, and other applicable statutes and/or College policies.

The following person has been designated to handle inquiries regarding the Americans with Disabilities Act, the Rehabilitation Act, Title VII, and related statutes and regulations: Ann C. Hayes, associate vice president of Human Resources and Title IX Coordinator, Administration Building/Humanities Center 108, Lebanon Valley College, 101 N. College Avenue, Annville, PA 17003–1400, 717–867–6416, `hayes@lvc.edu`.

Statement on the Use of Artificial Intelligence (AI)

Students should be aware that the work they submit must be their own. Professors may create assignments or activities that require or encourage the use of AI. If such use is not either required or allowed explicitly, then students must assume that the use of artificial intelligence is *not* acceptable in any given assignment. In this instance, unacknowledged

uses of artificial intelligence in student work can be deemed violations of our academic honesty policy (see above). If this is unclear in any way, it is the student's responsibility to ask the professor about appropriate uses of AI for the assignment.

Religious Accommodations

Lebanon Valley College is committed to providing a welcoming and supportive environment for students from all cultural and religious backgrounds. All members of the community should commit to students not suffering adverse consequences for practicing their religions. We recognize the Christian centeredness of our campus, including our Academic Calendar. We seek to support an environment that is welcoming to persons of all faith traditions and backgrounds. Students whose religious practice requires that they observe holidays other than those specified on the Academic Calendar should have a conversation with either a faculty member or the Chaplain and Coordinator of Spiritual Life to initiate the accommodation process. This conversation should happen within the first two weeks (or first week, if the course is a summer, winter, or graduate course meeting for less than 15 weeks) of each semester of their intent (even when the exact date of the day will not be known until later) so that alternative arrangements for both students and faculty can be made at the earliest opportunity. Any such conversation should seek to determine the needs of the student and the appropriate next steps. If the conversation starts through a faculty member, the faculty member should recommend that the student also have a conversation with the Chaplain so that the Chaplain may learn about the student's needs, attend to any non-academic requests, and refer the student to other impacted faculty. If the conversation starts with the Chaplain, the Chaplain will direct the student to also have a conversation with impacted faculty members.