

## **GENERAL PHYSICS II (PHY 140)**

### **COURSE AND INSTRUCTOR INFORMATION**

**Course:** PHY 140 (General Physics II), **Section:** 04

**Lecture Time and Location:** MWF: 9:00 am – 9:50 am in **Merion 113**

**Discussion Time and Location:** Thursday, 12:30 pm – 1:30 pm in **Brandywine 010**

**Instructor:** Anil K. Kandalam (Dr. Kandalam or Dr. K)

**Office Location:** Schmucker Science South, SS 403A

**Email:** akandalam@wcupa.edu

**Office Hours:** Wednesday: 8:00 am – 9:00 am, Thursday: 9:00 am – 11:00 am

Friday: 10:00 am – 11:00 am and 1:00 pm – 2:00 pm or by appointment

### **COURSE DESCRIPTION**

PHY140 is the second semester of a year-long introductory physics sequence. In PHY130 we discussed the properties of motion arising from mass. PHY140 covers electricity, magnetism, circuits, optics, quantum mechanics, and nuclear physics. A passing grade in PHY130 is the prerequisite for this course. **We will be using concepts from PHY130 on a daily basis as well as a good deal of algebra.** If you feel that your skills are weak in either of these two areas, please feel free to come and see me during office hours or by appointment. I am willing to work with you and help you catch up.

### **EXPECTATIONS**

This is a fast pace course. For a successful completion of this course, you are not only expected to come to the class regularly, but also take notes in the class regularly, solve the problems assigned in the class, and read the example problems from the text book. **In order to keep up with the pace of the course, I strongly suggest you to read the sections in the text indicated in the schedule before you get to class.**

### **REQUIRED COURSE MATERIALS & INCLUSIVE ACCESS**

***Textbook and Homework System:*** Physics 5/e by Walker with Mastering Physics.

***Textbook:*** An e-text of this book is directly accessible from the course D2L page. This is provided through WCU's ***Inclusive Access Program***. This means you should see \$112.93 charge appear on your Bursar's account. This is a discounted price. You may also upgrade to a physical copy at additional cost.

***If you have used/purchased Inclusive Access last semester for PHY130 at WCU:*** You won't be charged again by the University.

***If you Drop the Course:*** You can opt-out of ***Inclusive Access*** until the drop/add deadline. To opt out you must use the link provided in the email sent to your WCUPA email account from the WCU campus store. If you opt-out before the deadline, you receive a refund. Questions about Inclusive Access should be directed to: [inclusiveaccess@wcupa.edu](mailto:inclusiveaccess@wcupa.edu)

***Modified Mastering Physics:*** This course uses the online platform Mastering Physics for readings and homework assignments. You may access the Mastering Physics from the widget on our D2L course site

(see the **Student Registration Instructions attached**). If you experience any technical problems, use the links provided on these instructions to check your computer settings and, if necessary, contact Pearson Support. I recommend that you always use a “real computer” (not a mobile device) and the Mozilla Firefox web browser when working on “Mastering Physics”.

### **SPECIFIC COURSE OUTCOMES**

Students completing this course will be able to

- Develop a fundamental understanding of principles of electrostatics, electric current, magnetostatics, electromagnetic induction, geometrical and physical optics, and modern physics.
- Apply these concepts in solving numerical problems
- Exercise and develop reasoning skills
- Develop problem solving skills

### **D2L**

This course has a D2L page. I will post lecture slides, problems etc. to D2L. I will make a good faith effort to post draft versions prior to the lecture, *but these may have few revisions*.

### **GRADING**

Student learning will be assessed through regular in-class quizzes, weekly homework assignments, midterm examinations, laboratory, and the final exam.

The final grade for this course will be based on the following:

- Labs .....15%
- Homework .....15%
- Quiz .....5%
- Exams (3 @ 15% each).....45%
- Final exam.....20%

Letter grades will be assigned on the following scale. However, I reserve the right to adjust the weights of individual components, or the scale to account for unforeseen circumstances.

93 – 100 %	A	73 – 76 %	C
90 – 92 %	A–	70 – 72 %	C–
87 – 89 %	B+	67 – 69 %	D+
83 – 86 %	B	63 – 66 %	D
80 – 82 %	B–	60 – 62 %	D–
77 – 79 %	C+	59% or lower	F

### **HOMEWORK POLICIES**

This course will utilize an online homework system via **Modified Mastering Physics**. Homework will be assigned every week, starting from the first week of classes. Typically, the assignments are due by **11:00 PM (EST) on the due date**. Solutions to all homework problems will be available on Mastering Physics immediately after the assignment is due. So, no late submissions are allowed. I reserve the right to modify homework frequency and due-dates to reflect unforeseen circumstances. I will not drop any homework grades.

Please remember that you are responsible for completing homework assignments in a timely manner and informing me of problems, if any, in accessing the homework. Failure to complete an assignment because you could not access the homework an hour before it is due is not an excuse.

## **QUIZZES**

There will be a total of **seven** quizzes this term. Each quiz comprises of five concept-based multiple-choice questions that are based on the topics covered during the previous three lectures. A tentative list of days on which quizzes will be given can be found in the course schedule section of this syllabus. Please note that I reserve the right to modify the dates on which quizzes are given, as well as the total number of quizzes given, to reflect unforeseen circumstances. Quizzes will take approximately ten to fifteen minutes to complete, and will be given at the start of class on the days they have been scheduled. I will drop the lowest quiz grade. If you miss a quiz, you will receive a ZERO for it. **No make-up quizzes.** The only exception is for Excused Absences, as outlined in the [Excused Absences Policy](#) contained in the [WCU Undergraduate Catalog](#). Appropriate documentation must be provided.

## **REGULAR EXAM POLICY**

Four in-class exams (closed book) will be given during the semester. Each of these exams will consist of a combination of multiple choice questions (conceptual and numerical) and open-ended numerical problems for which the students are expected to show all the work (math steps). I will drop the lowest exam grade.

**If you miss an exam:** If you miss an exam, you will receive a ZERO on that exam. The policy of dropping an exam score is meant to alleviate the need for make-up exam. This means every student has one in-class exam that they can for whatever reason, sickness, family emergency, etc., not be counted. **Therefore, I will not give a make-up exam.** The exceptions, however, are limited to the absences related to University Sanctioned Events (see below). If you miss an exam for a University Sanctioned Event you must notify me in advance so that we can arrange for you to take the exam in a manner consistent with its integrity. You must also provide some form of documentation (performing arts program, competition schedule etc).

## **FINAL EXAM**

The final exam (closed book) will include all topics covered (cumulative) in the course and is **MANDATORY**. Final exam will consist of mostly multiple-choice questions (conceptual and numerical) and few open-ended questions. Missing the final exam will result in a zero for the exam unless EXTREME circumstances apply. Even in that case, extra questions will be added to the make-up final. You must bring your university ID to the final exam.

The dates and times of the final exam for this course (as set by the registrar) are:

**Wednesday, May 6, 2020 from 8:00 am – 10:00 am**

***You should plan to be available for the entire finals week.*** We have in past semesters had to reschedule finals due to weather related events.

## **LABORATORY**

This course has a laboratory component. Your lab grade will be factored into your final grade for this course. Please see the lab syllabus for more details.

## **CONTACT POLICY**

Please include **PHY140** in the subject line of any e-mail. I try to respond to e-mail within 24hrs. Although I will try to answer all questions directed to me by e-mail, most problems related to course content are best discussed during office hours.

## **ATTENDANCE POLICY**

A regular attendance to the lectures is an important part of this course and I highly recommend it. This is your chance to ask questions, see examples and get help in solving problems. I am here to guide you through the material. Attendance will benefit your understanding and therefore grade. However, **I do not give an attendance grade**. Students must understand that they are responsible for all material covered and assigned during their absences (excused and unexcused) and that they are responsible for the academic consequences of their absences. The lab component of this course, however, has a different attendance policy. **Please see lab syllabus for lab attendance policy.**

## **ELECTRONIC DEVICES POLICY**

In order to create a conducive learning environment, please arrange for all electronic devices to be set in silent/vibrate mode and put away. If you need to use a device to accommodate a disability, please see below. If I see anyone **texting or using their cell phones** during the class, I will take 5 points off of the nearest exam grade, and you will be considered “absent” for that day, since you are obviously not mentally present.

## **STUDENTS WITH DISABILITIES**

If you have a disability that requires accommodations under the Americans with Disabilities Act (ADA), please present your letter of accommodations and meet with me as soon as possible so that I can support your success in an informed manner. Accommodations cannot be granted retroactively. If you would like to know more about West Chester University’s Services for Students with Disabilities (OSSD), please visit them at 223 Lawrence Center. Their phone number is 610-436-2564, their fax number is 610-436-2600, their email address is [ossd@wcupa.edu](mailto:ossd@wcupa.edu), and their website is at [www.wcupa.edu/ussss/ossd](http://www.wcupa.edu/ussss/ossd). In an effort to assist students who either receive or may believe they are entitled to receive accommodations under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, the University has appointed a student advocate to be a contact for students who have questions regarding the provision of their accommodations or their right to accommodations. The advocate will assist any student who may have questions regarding these rights. The Director for Equity and Compliance/Title IX Coordinator has been designated in this role. Students who need assistance with their rights to accommodations should contact them at 610-436-2433.

## **EXCUSED ABSENCES POLICY**

If you are participating in a University sanctioned event during one of our scheduled exams you must notify me in advance. You must provide some form of documentation. We can then arrange for you to take the exam in a manner consistent with exam integrity. Students are advised to carefully read and comply with the excused absences policy, including absences for university-sanctioned events, contained in the WCU Undergraduate Catalog. In particular, please note that the “responsibility for meeting academic requirements rests with the student,” that this policy does not excuse students from completing required academic work, and that professors can require a “fair alternative” to attendance on those days that students must be absent from class in order to participate in a University-Sanctioned Event.

## **E-MAIL POLICY STATEMENT**

It is expected that faculty, staff, and students activate and maintain regular access to University provided e-mail accounts. Official university communications, including those from your instructor, will be sent through your university e-mail account. You are responsible for accessing that mail to be sure to obtain official University communications. Failure to access will not exempt individuals from the responsibilities associated with this course.

**COURSE SCHEDULE:** A tentative schedule for the course is given below. I will try to follow it as closely as possible. **I reserve the right to modify the schedule as needed over the course of the semester.**

	Date		Lecture and Discussion	Reading	Laboratory
Wk1	W	Jan. 22	<b>19:</b> Electric Charge, Insulators and Conductors	19 – 1, 19 – 2	Introduction
	R	Jan. 23	<b>19:</b> Coulomb's Law	19 – 3	
	F	Jan. 24	<b>19:</b> The Electric Field	19 – 4	
Wk2	M	Jan. 27	<b>19:</b> Electric Flux and Gauss's Law	19 – 7	Electric Charge
	W	Jan. 29	<b>Chapter 19: Quiz #1 &amp; Problem Solving</b>		
	R	Jan. 30	<b>20:</b> Electric Potential and Electric Potential Energy	20 – 1	
	F	Jan. 31	<b>20:</b> Energy Conservation	20 – 2	
Wk3	M	Feb. 3	<b>20:</b> Potential of Point Charges & Equipotential surfaces	20 – 3, 20 – 4	NO LAB
	W	Feb. 5	<b>Chapter 20: Problem Solving</b>		
	R	Feb. 6	<b>20:</b> Capacitors and Dielectrics	20 – 5	
	F	Feb. 7	<b>20:</b> Electrical Energy Storage	20 – 6	
Wk4	M	Feb. 10	<b>Ch. 20: Quiz # 2</b> <b>21:</b> Electric Current and Resistance	21 – 1, 21 – 2	Equipotential Lines
	W	Feb. 12	<b>21:</b> Ohm's Law, Energy and Power in Electric Circuits	21 – 3	
	R	Feb. 13	<b>Chapter 21: Problem Solving</b>		
	F	Feb. 14	<b>Exam I: Chapters 19 &amp; 20</b>		
Wk5	M	Feb. 17	<b>21:</b> Resistors in Series & Parallel	21 – 4	Ohm's Law
	W	Feb. 19	<b>21:</b> Resistors in Series & Parallel	21 – 4	
	R	Feb. 20	<b>Chapter 21: Quiz #3 &amp; More Problem Solving</b>		
	F	Feb. 21	<b>21:</b> Circuits Containing Capacitors	21 – 6	
Wk6	M	Feb. 24	<b>21:</b> RC Circuits	21 – 7	Resistors in Series
	W	Feb. 26	<b>22:</b> Magnetic field, Magnetic force on point charge	22 – 1, 22 – 2	
	R	Feb. 27	<b>22:</b> Motion of charged particle in magnetic field	22 – 3	
	F	Feb. 28	<b>Chapter 22: Problem Solving</b>		
Wk7	M	Mar. 2	<b>22:</b> Motion of charged particle in magnetic field	22 – 3	Resistors in Parallel
	W	Mar. 4	<b>22:</b> Magnetic force on a current carrying wire & loop	22 – 4 & 22 – 5	
	R	Mar. 5	<b>Ch 22: Quiz #4</b> <b>22:</b> Magnetic Fields and Ampere's Law	22 – 6	
	F	Mar. 6	<b>Exam II: Chapters 21 &amp; 22</b>		
	M	Mar. 9	<b>SPRING BREAK</b>		NO LAB
	W	Mar. 11			
	R	Mar. 12			
	F	Mar. 13			
Wk8	M	Mar. 16	<b>22:</b> Current loops and Solenoid	22 – 7	RC Circuits
	W	Mar. 18	<b>Chapter 22: More Problem Solving</b>		
	R	Mar. 19	<b>23:</b> Induced Electromotive force & Magnetic flux	23 – 1, 23 – 2	
	F	Mar. 20	<b>23:</b> Faraday's Law of Induction and Lenz's Law	23 – 3, 23 – 4	
Wk9	M	Mar. 23	<b>23:</b> Mechanical Energy and Electrical Energy	23 – 5	NO LAB
	W	Mar. 25	<b>23:</b> Generators & Motors	23 – 6	
	R	Mar. 26	<b>Chapter 23: Quiz #5 &amp; Problem Solving</b>		
	F	Mar. 27	<b>23:</b> Inductance & Energy stored in a magnetic field	23 – 7, 23 – 8	
Wk10	M	Mar. 30	<b>25:</b> Production & Propagation of EM Waves	25 – 1, 25 – 2	EM Induction
	W	Apr. 1	<b>25:</b> The Doppler Effect & EM spectrum	25 – 3	
	R	Apr. 2	<b>Chapter 25: Problem Solving</b>		

	Date	Lecture and Discussion	Reading	Laboratory
	F Apr. 3	25: Energy carried by EM Waves	25 – 4	
Wk11	M Apr. 6	25: Energy and Momentum in EM Waves	25 – 4	NO LAB
	W Apr. 8	Chapter 25: Quiz #6 & More Problem Solving		
	R Apr. 9	Exam III: Chapters 23 & 25		
	F Apr. 10	25: Polarization	25 – 5	
Wk12	M Apr. 13	26: The Reflection of light & Plane mirror	26 – 1, 26 – 2	Snell's Law
	W Apr. 15	26: Spherical mirrors, ray-tracing and mirror equation	26 – 3, 26 – 4	
	R Apr. 16	Chapter 26: Problem Solving		
	F Apr. 17	26: The refraction of light and lenses	26 – 5	
Wk13	M Apr. 20	26: Ray tracing of lenses and thin lens equation	26 – 6, 26 – 7	Thin Lenses
	W Apr. 22	Chapter 26: Quiz #7 & More Problem Solving		
	R Apr. 23	27: Optical Instruments	27 – 2	
	F Apr. 24	27: Optical Instruments	27 – 1	
Wk14	M Apr. 27	Exam IV: Chapters 26 & 27		NO LAB
	W Apr. 29	Chapter 27: Problem Solving		
	R Apr. 30	28: Superposition & Interference	28 – 1	
	F May 1	28: Young's two-slit experiment & Diffraction	28 – 2, 28 – 4	
	M May 4	Chapter 28: Problem Solving		
FINAL EXAM: WEDNESDAY, May 6 2020 (8:00 am – 10:00 am)				

Note that if the University is closed (due to snow or for any other reason) for a regularly scheduled lab session, then we will use one of the weeks marked as “No Lab” to makeup the canceled lab sections.

### **ACADEMIC & PERSONAL INTEGRITY**

It is the responsibility of each student to adhere to the university's standards for academic integrity. Violations of academic integrity include any act that violates the rights of another student in academic work, that involves misrepresentation of your own work, or that disrupts the instruction of the course. Other violations include (but are not limited to): cheating on assignments or examinations; plagiarizing, which means copying any part of another's work and/or using ideas of another and presenting them as one's own without giving proper credit to the source; selling, purchasing, or exchanging of term papers; falsifying of information; and using your own work from one class to fulfill the assignment for another class without significant modification. Proof of academic misconduct can result in the automatic failure and removal from this course. For questions regarding Academic Integrity, the No-Grade Policy, Sexual Harassment, or the Student Code of Conduct, students are encouraged to refer to the Department Undergraduate Handbook, the Undergraduate Catalog, the Ram's Eye View, and the University website at [www.wcupa.edu](http://www.wcupa.edu).

### **INTELLECTUAL PROPERTY STATEMENT**

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and all such permissions and waivers shall terminate on the last day of the finals in the semester in which this course is held.

Links and references to on-line resources provided by the instructor may lead to other sites. The instructor does not sponsor, endorse or otherwise approve of any information appearing in those sites, nor is responsible in any way for the content of those sites. The instructor makes no warranty or responsibility for the copyright status of such material. However, should problems with copyright status be brought to the attention of the instructor, reference to offending materials will be removed.

### **ALL OTHER ACADEMIC POLICIES**

For any university wide academic policy not explicitly covered in this document, such NO Grade policies, please consult your major advising handbook, the Undergraduate Catalog, the Ram's Eye View, or University Website.

### **REPORTING INCIDENTS OF SEXUAL VIOLENCE**

West Chester University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX Coordinator. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred to the person designated in the University protection of minors policy. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at the webpage for the Office of Diversity, Equity, and Inclusion at [https://www.wcupa.edu/\\_admin/diversityEquityInclusion/aboutUs.aspx](https://www.wcupa.edu/_admin/diversityEquityInclusion/aboutUs.aspx).

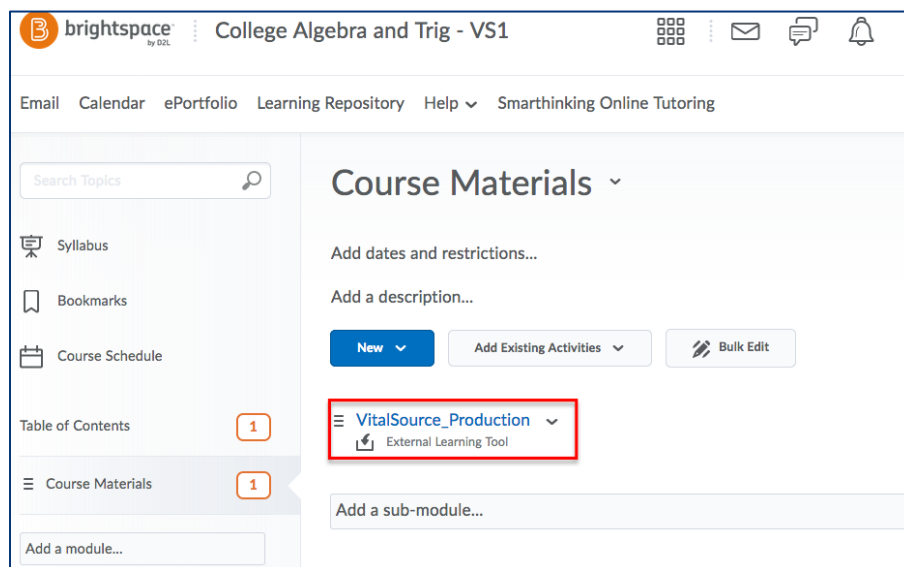
### **EMERGENCY PREPAREDNESS**

All students are encouraged to sign up for the University's free WCU ALERT service, which delivers official WCU emergency text messages directly to your cell phone. For more information, visit [www.wcupa.edu/wcualert](http://www.wcupa.edu/wcualert). To report an emergency, call the Department of Public Safety at 610-436-3311.

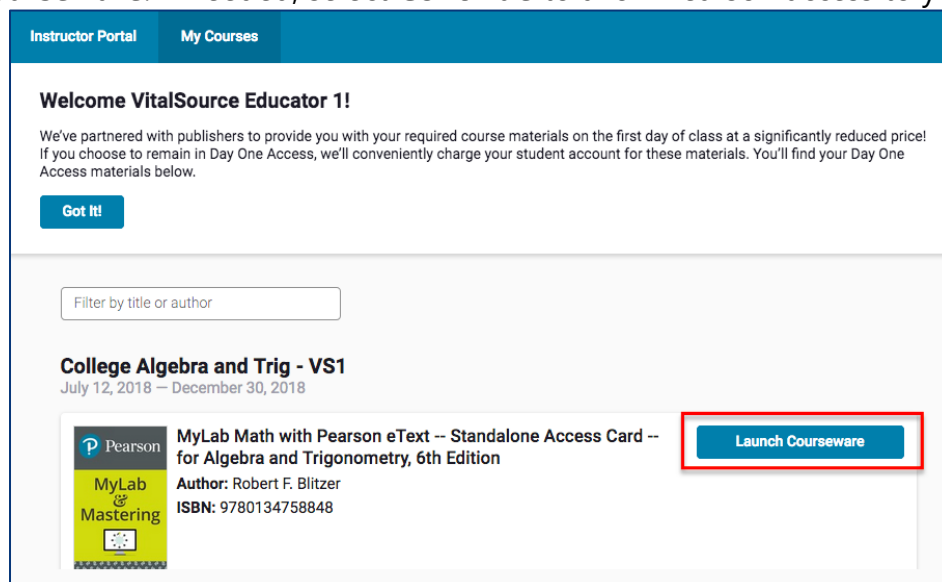


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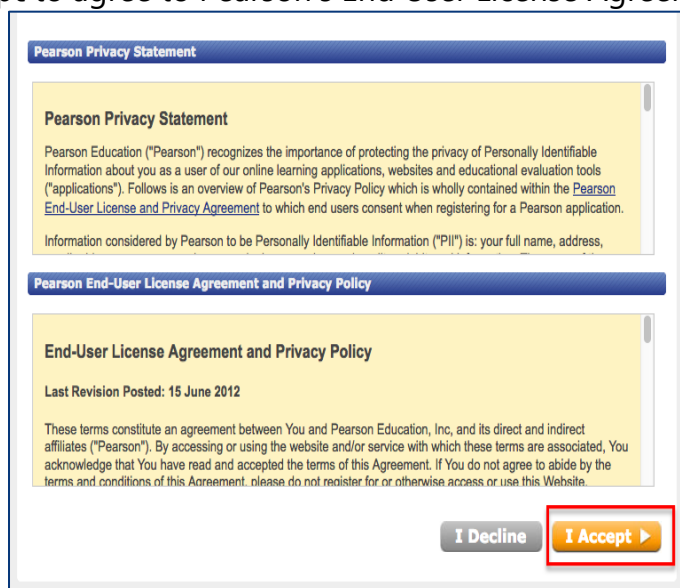
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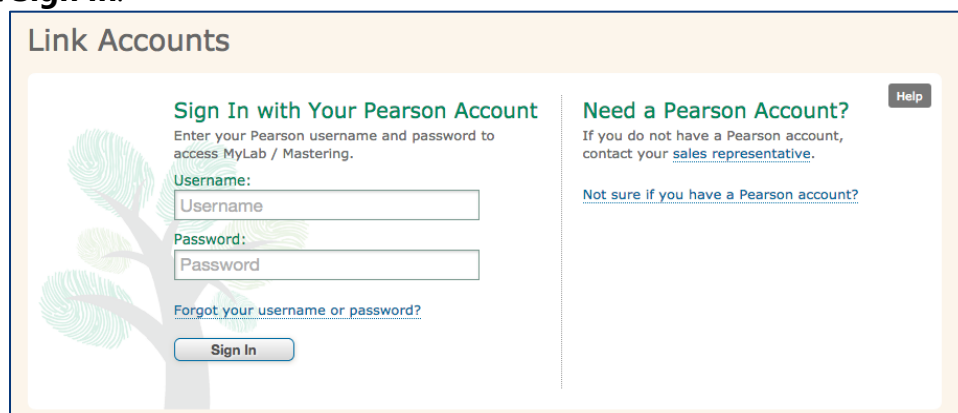
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**End-User License Agreement and Privacy Policy**

Last Revision Posted: 15 June 2012

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**Link Accounts**

**Sign In with Your Pearson Account**

Enter your Pearson username and password to access MyLab / Mastering.

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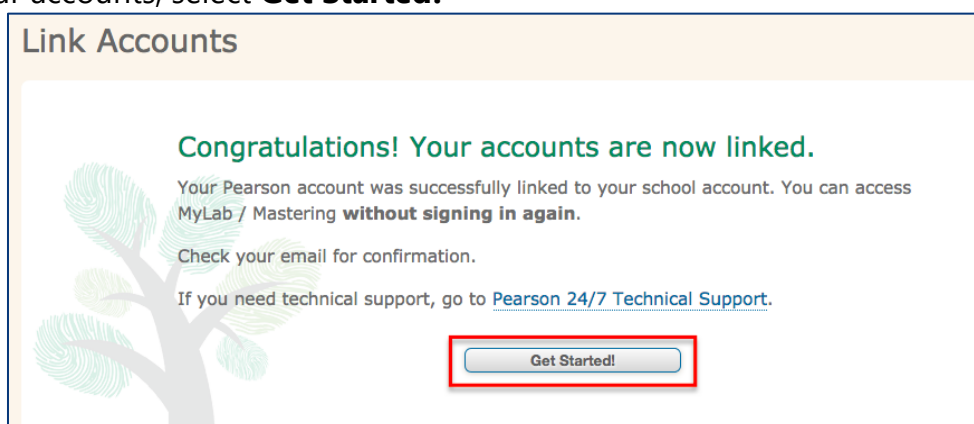
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