

SCED 201 SYLLABUS (SPRING 2020)

WELCOME TO MATTER & ENERGY IN PHYSICAL SYSTEMS!

COURSE OVERVIEW

► *What does the course catalog say about this course?*

Course Number	Course Name	Credits	Prerequisite(s)
SCED 201	Matter & Energy in Physical Systems	4	MATH 112 or equivalent

INSTRUCTOR INFORMATION

► *Instructor of Record: Erin Duffy*

- **What should you call me?** Dr. Duffy, Prof. Duffy, or Erin is fine.
- **Email:** duffye@wwu.edu (Note: I will do my best to respond within 24 hours if it is a weekday; weekend emails may take longer for a response.)
- **Video Office Hours:** MWF 2 – 4 pm, TR 11 am – 1 pm
 - **Zoom Links:** MWF - <https://zoom.us/j/516873668>; TR - <https://zoom.us/j/602321547>
 - I will be making myself available via Zoom during our originally scheduled class period, as well as an hour each on Tuesday and Thursday, if you would like to talk or ask questions. Simply follow the corresponding Zoom link to join the video meeting!
 - If my scheduled times don't work for you, then please feel free to set up a different time to meet with me if you'd prefer to talk via Zoom. All you have to do is send me an email with some suggested times, and I can let you know what works with my schedule!

► *Teaching Assistant (TA): Emily Schumacher*

- **What should you call me?** You can call me Emily.
- **Email:** schumae3@wwu.edu
- **Video Office Hours:** TR 1 – 3 pm
 - **Zoom Link:** <https://zoom.us/j/602321547>
 - If my scheduled times don't work for you, then please feel free to set up a different time to meet with me if you'd prefer to talk via Zoom. All you have to do is send me an email with some suggested times, and I can let you know what works with my schedule!

COURSE DESCRIPTION

► *Overall Course Design & Learning Goals*

- This is a student-centered, lab-based physics course intended primarily for students pursuing a career in K-8 teaching. As such, this course has learning goals with respect to knowledge in both *science content* and *how people learn* (especially **physics** and **metacognition**, respectively.)
 1. **Physics Content:** Students develop understanding of energy and force based on their own investigations, and they apply these concepts to explain real world phenomena.
 2. **Metacognitive Skills:** Students develop awareness of how their own ideas change and develop and reflect on specific ways the curriculum and instruction facilitate these changes.
- My approach to this course (as well as the assigned text) is guided by the principles of **Three-Dimensional Learning (3DL)**, which is the framework upon which the *Next Generation Science Standards (NGSS)* were developed. The *NGSS* have been adopted by the state of Washington.

► *What You Will Do in This Course*

With your peers and independently, you will...

- Think about what you know about various physics topics and consider how you can build upon or refine your existing knowledge and its organization in your mind.
- Apply your knowledge to solve problems, explain phenomena, make evidence-based predictions, and develop arguments to support your predictions.
- Monitor your own learning by thoughtfully completing lessons and participating in class discussions on Canvas.

► *Course Materials*

- Access to all required course texts and assignments will be available on Canvas.
 - You can log in to Canvas using your Western credentials at <https://www.instructure.com>. Look for “**Duffy - SCED 201 - S2020**” to find our course.
- The texts use in this course are from *Next Generation Physical Science & Everyday Thinking (NextGenPET)* by F. Goldberg, S. Robinson, and V. Otero.
 - The publisher has agreed for the SCED 201 instructors at WWU to provide you with digital copies of the course materials via Canvas. **Do not purchase the text at the Bookstore!**
- As WWU students, you have access to [Office365](#) (Microsoft Word, PowerPoint, Excel, Outlook) and [G Suite](#) (Google Docs, Sheets, Slides).
 - You can log in to these services using your Western credentials.
- For other resources available to you, as well as a potentially helpful guide to remote learning, you may wish to visit the [Keep Learning page](#) provided by ATUS.

COURSE COMPONENTS & GRADING

► *Grading Scale*

- You **may choose** to receive a grade on the A-F scale. The following grading cutoffs will be used:

	A	A-	B+	B	B-	C+	C	C-	D	F
Points	930	890	850	810	770	730	690	650	550	<550
%	93	89	85	81	77	73	69	65	54	<55

- All classes are by default Pass/No Pass (P/NP) this quarter. **You need 600 points to earn a Pass.**
 - This course is graded out of 1000 points**; the vast majority of points are based on completion/participation in assignments.
 - If you are having trouble completing your assignments in a timely manner, please reach out and talk to me! I can be flexible with due dates, especially during the unusual circumstances of this quarter.
 - These cutoffs will not be raised but may be lowered at my discretion. There will be no “curve” (i.e., forcing the letter grades into a particular distribution) or artificial grade inflation (i.e., points added for no reason).
- Your grade in this course will be based upon your performance in the categories described below.

► *Initial Ideas & Explorations (“Lessons”)*

Most weeks, we will complete two Lessons from the text, which will involve two components:

- Initial Ideas:** This component must be completed **before** the rest of the activity will be made accessible on Canvas. Here, you and your partner will respond to some prompts based on your prior knowledge.
- Explorations:** This component will become available after you complete the corresponding Initial Ideas. Each of these activities will ask you to analyze and interpret data (usually in the form of observations or graphs) provided to you. Normally, you and your teammates would conduct experiments and analyze your own data, but due to the unique circumstances of this quarter, videos of relevant experiments will be provided to you.

Grading

- Grading will be based on completion, not correctness** (although if anything is glaringly wrong in the Explorations component, the TA or I will try to make comments on your submitted work).
- Initial Ideas are worth five (5) points each.** The lowest three (3) scores will be dropped.
- Explorations are worth fifteen (15) points each.** The lowest three (3) scores will be dropped.

► *SQ Presentations & Discussion*

The end of each Lesson will have a set of Summarizing Questions (SQs). You should answer all of them, and you will be asked to “present” on one or more of them as well as engage in discussion with your classmates via the Discussion boards on Canvas.

- **Presentations:** For each question that you are assigned to present, you and your partner should make a short video and/or screencast in which you discuss your responses to the questions **as well as** explain your reasoning for the answers you provided. (To guide your explanations, additional “reasoning prompts” will be given to you.)
- **Discussion:** Individually, you will be asked to comment on **at least two (2)** other presentations. To ensure that everyone is getting some amount of peer feedback, I will likely assign which groups you should interact with each week. (Of course, you are free to comment on other presentations in addition to your assigned groups, if you would like.)

Grading

- **Grading will be based on participation**—both your uploaded presentation and your comments on others’ presentations.
- **Presentations are worth fifteen (15) points each;** you and your partner will get the same score. The lowest three (3) scores will be dropped.
- **Discussion comments are worth five (5) points each;** you will be graded individually. The lowest six (6) scores will be dropped.

► *Lesson “Extensions”*

Many Lessons have a corresponding “Extension” activity, which will be integrated into Canvas as quizzes. There are two components to Extensions:

- **Activities:** These are the actual quizzes available in Canvas. They will consist of mostly multiple-choice questions. The length of each extension varies: some have fewer than 10 questions, and the longest has 20 questions.
 - You will have **unlimited attempts** to complete each Extension with **no penalty for multiple attempts.**
- **Reflections:** Since you may take multiple attempts to complete the activities correctly, you should note down any of your initially incorrect choices with an explanation of why they were incorrect and how your thinking has changed or become more sophisticated. This document of errors and revisions will count as the Reflection.
 - **If you choose only correct answers in your first attempt,** then your Reflection should consist of a commentary on your learning as a result of the overall Lesson. Here are some example prompts to think about: How has your knowledge about physics grown or become more nuanced? What could you take away from the Lesson that you could use to help someone else learn about the Lesson’s particular topic(s)?

Grading

- **Extension Activities are worth eight (8) points each** and will be graded for **correctness**. The lowest three (3) scores will be dropped.
 - Since you are allowed unlimited attempts, I recommend you try until you get 100%!
- **Extension Reflections are worth two (2) points each** and will be graded for **completion**. The lowest three (3) scores will be dropped.

Schedule

- All Extensions for a given unit will be assigned at the start of the unit and due at the end of the unit:

Ext	Title	Date Assigned	Date Due
EM A	Representing Motion on Speed-Time Graphs	Monday, April 6, at 12:00 am	Sunday, May 3, at 11:59 pm
EM C	Describing Interactions in Terms of Energy		
EM D	Scientific Explanations		
EM E	Simultaneous Interactions		
EM F	Effects of Friction		
EM G	Mechanisms for Heat Interactions		
PEF A	More on Elastic Energy	Monday, May 4, at 12:00 am	Sunday, May 17, at 11:59 pm
PEF C	Exploring Magnetic and Electric Fields		
PEF D	Exploring Gravitational and Potential Energy		
FM A	Force Diagrams	Monday, May 18, at 12:00 am	Sunday, June 7, at 11:59 pm
FM B	Pushing a Skateboarder		
FM C	Connecting Force and Energy Models		
FM D	How Does Friction Work?		
FM E	Changing Direction		

► *Learning Commentaries*

There will be three (3) essay assignments in this course. Since this is a Science Education course, these essays will be related to ideas about teaching and learning in the context of this class. More specific directions and guidelines will be provided for each assignment. For now, please know that they will be somewhat short (250-500 words).

- **Each Learning Commentary will be worth fifty (50) points**; the lowest score will be dropped.

► *Midterm Assignments*

In lieu of a traditional midterm, you will be asked to use your knowledge to **write exam questions**:

- At the end of Unit EM and Unit PEF, each pair of students will be asked to write two (2) questions related to the topic(s) of their choosing from the unit. More details and guidelines will be provided.
- Your questions should also include the correct answer and three (3) incorrect answer choices.
- Some of these student-developed questions may be included on the final exam.

Grading

- **Each question/answer set will be worth twenty-five (25) points.** Since you will write two (2) questions each for Unit EM and Unit PEF, that is 100 points total throughout the quarter.
 - Writing good questions can be challenging! However, the more well-written your questions are, the more likely they are to appear on the final exam!
 - What constitutes a “good” question will be described in more detail in the assignment instructions.

► *Introduction Presentation & Syllabus Quiz*

- **Your Introduction is worth five (5) points** and is based on completion.
- **The Syllabus Quiz is worth five (5) points** and is based on correctness.

► *Summary of Graded Components*

The table below summarizes the previous information about course components and grading:

Component	Points Per Assignment	Total Number of Assignments	Number of Dropped Assignments	Max Points Possible
Initial Ideas	5	15	3	60
Explorations	15	16	3	195
SQ Presentations	15	16	3	195
Discussion Comments	5	32	6	130
Extension Activities	8	14	3	88
Extension Reflections	2	14	3	22
Learning Commentaries	50	3	1	100
Midterm Assignments	50	2	0	100
Final Exam	100	1	0	100
Introduction	5	1	0	5
Syllabus Quiz	5	1	0	5
Total Points Possible				1000

COURSE SCHEDULE

Week	Mtg #	Date	Anticipated Activities
1	3	6 Apr	Intro to SCED 201 EM 1: Interactions and Motion
	4	8 Apr	
	5	10 Apr	
2	6	13 Apr	EM 2: Motion and Energy EM 3: Slowing and Stopping
	7	15 Apr	
	8	17 Apr	
3	9	20 Apr	EM 4: Friction as an Interaction EM 5: Warming and Cooling Midterm Assignment 1 Posted
	10	22 Apr	
	11	24 Apr	
4	12	27 Apr	EM 6: Electric Circuit Interactions PEF 1: Elastic Objects and Energy
	13	29 Apr	
	14	1 May	
5	15	4 May	PEF 2: Comparing Magnetic & Static Electric Interactions PEF 3: Magnetic & Static Electric Interactions and Energy
	16	6 May	
	17	8 May	
6	18	11 May	PEF 4: Gravitational Interactions and Energy Midterm Assignment 2 Posted
	19	13 May	
	20	15 May	
7	21	18 May	FM 1: Forces and Motion FM 2: Motion with a Continuous Force
	22	20 May	
	23	22 May	
8	24	25 May	Memorial Day
	24	27 May	FM 3: Pushes and Slowing Down FM 4: Friction and Slowing
	25	29 May	
9	26	1 Jun	FM 5: Changing Force Strength FM 6: Falling Objects
	27	3 Jun	
	28	5 Jun	
Finals	29	11 Jun	Final Exam Due 11:59 PM (Pacific Time)

UNIVERSITY & COURSE POLICIES

► *WWU Policies*

All students in this course are expected to abide by university policies. For a relatively concise summary of the following official university policies, please visit Syllabi@WWU:

- Academic Honesty
- Accommodations
- Ethical Computing Conduct
- Equal Opportunity
- Finals Week Policies
- Medical Excuse Policy
- Student Conduct Code

Further information regarding university policies is available on the [University Academic Policies](#) page and in the [Appendices](#) of the WWU Catalog.

► *Course Policies*

Please note that course policies are subject to change. Any changes will be announced via email or Canvas. Students will be held responsible for all changes.

Attendance Policy

- There are **no required synchronous “in-person” meetings** for this course. All meetings via Zoom with the instructors are completely optional.
 - If you do attend a video meeting with the TA or me, please be sure that you are clothed in view of the camera. (Alternatively, you may turn video off and communicate via audio only.)
 - For all meetings via Zoom, you may choose to communicate via audio only. In the event that there are many people in the Zoom meeting and you do not wish to speak up, you may type in the Chat box instead. (You can also privately chat with specific participants by “@-ing” them in the Chat box.)
- You and your partner may decide to meet (e.g., via Zoom, Skype, Facetime, etc.); in that case, you should follow through on your agreements with your partner in this course.

Late Policy

- Most assignments on Canvas have a specified due date. Assignments uploaded after the due date are considered late.
- Late assignments **may** still be awarded full credit. The table below shows how many late submissions of each assignment type will be accepted for full credit. Any additional late submissions may be accepted for **half credit**.

- Depending on the circumstances, I may be amenable to granting an extension, in which case there would be no late penalty. If you believe this applies to your situation, please discuss this with me by email.

Component	Number of Late Assignments Accepted for Full Credit
Initial Ideas	2
Explorations	2
SQ Presentations	2
Discussion Comments	4
Extension Activities	3
Extension Reflections	3
Learning Commentaries	1
Midterm Assignments	1
Final Exam	0
Introduction	0
Syllabus Quiz	0

Canvas Discussion Policy

- Please keep comments in the Canvas Discussion boards **civil, thoughtful, and constructive**.
 - Everyone has had different experiences in physics and science in general up to this point. Not everyone has previously taken a physics course in high school or elsewhere. Just because you may have prior knowledge about something doesn't mean you should be judgmental or criticize someone for not knowing something that you (think you) know.

UNIVERSITY RESOURCES

► *Overview of Student Services*

Students have access to a great many different services provided by the university. [The Overview of Student Services](#) page provides links to resources in the following categories:

- Academic Support
- Finance
- Media & Publications
- Equity & Inclusion
- Making Connections
- Safety & Health

Many of these pages provide information about how their operations are different (e.g., remote access) during the unusual circumstances due to the COVID-19 pandemic.

▶ *“Complete Guide” to Spring 2020*

The university has established an online guide to provide more information and resources to help students during this quarter. The [Spring 2020 Complete Guide for Students](#) includes frequently asked questions (FAQs) and other information about the following topics:

- Financial Aid
- Teaching & Learning
- Student Services
- Healthcare Options
- Tech Assistance
- Learning from Home
- Accommodations
- Regional Resources
- Student FAQs

▶ *Coronavirus Information*

Last quarter, the university started maintaining a [Coronavirus Information webpage](#) to provide updates about the impact of COVID-19 on the Western community.