1. General Information

1a. Submitted by the College of: ENGINEERING

   Date Submitted: 5/6/2016

1b. Department/Division: Engineering

1c. Contact Person

       Name: Doug Klein

       Email: doug.klein@uky.edu

       Phone: 8-0651

     Responsible Faculty ID (if different from Contact)

       Name: Kamyar Mahboub

       Email: kc.mahboub@uky.edu

       Phone: 7-4279

1d. Requested Effective Date: Semester following approval

1e. Should this course be a UK Core Course? No

2. Designation and Description of Proposed Course

2a. Will this course also be offered through Distance Learning?: No

2b. Prefix and Number: EGR 505

2c. Full Title: Project Lead the Way: Subtitle Required

2d. Transcript Title: Project Lead the Way: Subtitle Required

2e. Cross-listing:

2f. Meeting Patterns

     LECTURE: 1-6

     LABORATORY:

2g. Grading System: Letter (A, B, C, etc.)

2h. Number of credit hours: 1-6

2i. Is this course repeatable for additional credit? Yes

   If Yes: Maximum number of credit hours: 18

   If Yes: Will this course allow multiple registrations during the same semester? Yes

2j. Course Description for Bulletin: Project Lead The Way is the nation's leading provider of science, technology, engineering, and math (STEM) programs. Through world-class K-12 curriculum, high-quality teacher professional development, and outstanding partnerships, PLTW is helping students develop the skills needed to succeed in the global economy. To be an educator in this program teacher must successfully complete a core training session. Core Training is an intensive program intended to give Instructors an overview of the PLTW course they will be teaching. Class meets from 8am to 5pm each day, with an hour for lunch. Attendance is required at all sessions. During the training, participants complete a portfolio in order to be certified to teach the course and receive credit

2k. Prerequisites, if any: Completion of a bachelors or be registered as a junior or higher at a Kentucky university.

2l. Supplementary Teaching Component:

3. Will this course taught off campus?   No

    If YES, enter the off campus address:

4. Frequency of Course Offering: Summer,

    Will the course be offered every year?:   Yes

    If No, explain:

5. Are facilities and personnel necessary for the proposed new course available?:   Yes

    If No, explain:

6. What enrollment (per section per semester) may reasonably be expected?:   25

7. Anticipated Student Demand

    Will this course serve students primarily within the degree program?:   No

    Will it be of interest to a significant number of students outside the degree pgm?:   Yes

    If Yes, explain: Available for education majors interested in teaching STEM classes. College of Engineering students are prohibited from taking this class.

8. Check the category most applicable to this course: Relatively New – Now Being Widely Established,

    If No, explain:

9. Course Relationship to Program(s).

    a. Is this course part of a proposed new program?:   No

    If YES, name the proposed new program:

    b. Will this course be a new requirement for ANY program?:   No

    If YES, list affected programs:

10. Information to be Placed on Syllabus.

    a. Is the course 400G or 500?:   Yes

b. The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if applicable, from **10.a** above) are attached: Yes

Distance Learning Form

Instructor Name:

Instructor Email:

Internet/Web-based: No

Interactive Video: No

Hybrid: No

1.How does this course provide for timely and appropriate interaction between students and faculty and among students? Does the course syllabus conform to University Senate Syllabus Guidelines, specifically the Distance Learning Considerations?

2.How do you ensure that the experience for a DL student is comparable to that of a classroom-based student's experience? Aspects to explore: textbooks, course goals, assessment of student learning outcomes, etc.

3.How is the integrity of student work ensured? Please speak to aspects such as password-protected course portals, proctors for exams at interactive video sites; academic offense policy; etc.

4.Will offering this course via DL result in at least 25% or at least 50% (based on total credit hours required for completion) of a degree program being offered via any form of DL, as defined above?

If yes, which percentage, and which program(s)?

5.How are students taking the course via DL assured of equivalent access to student services, similar to that of a student taking the class in a traditional classroom setting?

6.How do course requirements ensure that students make appropriate use of learning resources?

7.Please explain specifically how access is provided to laboratories, facilities, and equipment appropriate to the course or program.

8.How are students informed of procedures for resolving technical complaints? Does the syllabus list the entities available to offer technical help with the delivery and/or receipt of the course, such as the Information Technology Customer Service Center (http://www.uky.edu/UKIT/)?

9.Will the course be delivered via services available through the Distance Learning Program (DLP) and the Academic Technology Group (ATL)?   NO

If no, explain how student enrolled in DL courses are able to use the technology employed, as well as how students will be provided with assistance in using said technology.

10.Does the syllabus contain all the required components?   NO

11.I, the instructor of record, have read and understood all of the university-level statements regarding DL.

Instructor Name:

EGR 505: Project Lead the Way
Credits earned: 3.0-18.0 (variable)

Instructor: Doug Klein, Dr. Kamyar Mahboub (Dean of Outreach)
Office Address: 310 Ralph G. Anderson Bldg.   **Email:** info@pltwky.org
Office Phone: 257-1234   **Office hours:** By appointment

Course Description:
Project Lead The Way is the nation's leading provider of science, technology, engineering, and math (STEM) programs. Through world-class K-12 curriculum, high-quality teacher professional development, and outstanding partnerships, PLTW is helping students develop the skills needed to succeed in the global economy. To be an educator in this program teachers must successfully complete a core training session. Core Training is an intensive program intended to give Instructors an overview of a PLTW course they will be teaching. For each 80 hour core training session the participant may receive 3 credits for EGR 505.

Prerequisites: Completion of a bachelors or be registered as a junior at a Kentucky university. Not open to engineering students.

Required Materials
   Laptop

Process for receiving EGR 505 credit
To obtain credit for EGR 505, you must
   • Register for a PLTW Core Training through PLTW.org
   • Complete all Readiness Activities before attendance
   • Successful complete all assignments during the training session
   • Develop a portfolio of work completed at training
   • Complete any additional assignments set by the college of engineering
   • Be enrolled at the University of Kentucky.
   • pay any designated University of Kentucky tuition and fees
Students need to contact the PLTW Affiliate Director (at UK) to request EGR 505 credit(s) through info@pltwky.org. The student's PLTW Master Teacher will need to submit required data to the PLTW Affiliate Director.

Course Schedule
Course schedule will be provided upon registration for this course and can be obtained prior to registration be emailing the request to info@pltwky.org

Course Grading
EGR 505 is graded as a pass or fail course on the successful completion of all assignments and submission of course portfolio.

Areas of Study

 Students may complete EGR 505 in each of the following focus areas.

- **Introduction to Engineering Design (IED, 80 Hours Class time)**

Students dig deep into the engineering design process, applying math, science, and engineering standards to hands-on projects. They work both individually and in teams to design solutions to a variety of problems using 3D modeling software, and use an engineering notebook to document their work.

- **Principles of Engineering (POE, 80 Hours Class time)**

Through problems that engage and challenge, students explore a broad range of engineering topics, including mechanisms, the strength of structures and materials, and automation. Students develop skills in problem solving, research, and design while learning strategies for design process documentation, collaboration, and presentation.

- **Aerospace Engineering (AE, 80 Hours Class time)**

This course propels students' learning in the fundamentals of atmospheric and space flight. As they explore the physics of flight, students bring the concepts to life by designing an airfoil, propulsion system, and rockets. They learn basic orbital mechanics using industry-standard software. They also explore robot systems through projects such as remotely operated vehicles.

- **Civil Engineering and Architecture (CEA, 80 Hours Class time)**

Students learn important aspects of building and site design and development. They apply math, science, and standard engineering practices to design both residential and commercial projects and document their work using 3D architecture design software.

- **Computer Integrated Manufacturing (CIM, 80 Hours Class time)**

Manufactured items are part of everyday life, yet most students have not been introduced to the high-tech, innovative nature of modern manufacturing. This course illuminates the opportunities related to understanding manufacturing. At the same time, it teaches students about manufacturing processes, product design, robotics, and automation. Students can earn a virtual manufacturing badge recognized by the National Manufacturing Badge system.

- **Computer Science and Software Engineering (CSE, 80 Hours Class time)**

Open doors in any career with computer science! In CSE, students create apps for mobile devices, automate tasks in a variety of languages, and find patterns in data. Students collaborate to create and present solutions that can improve people's lives, and weigh the ethical and societal issues of how computing and connectivity are changing the world.

- **Digital Electronics (DE, 80 Hours Class time)**

From smart phones to appliances, digital circuits are all around us. This course provides a foundation for students who are interested in electrical engineering, electronics, or circuit design. Students study topics such as combinational and sequential logic and are exposed to circuit design tools used in industry, including logic gates, integrated circuits, and programmable logic devices.

- **Environmental Sustainability (ES, 80 Hours Class time)**

In ES, students investigate and design solutions in response to real-world challenges related to clean and abundant drinking water, food supply issues, and renewable energy. Applying their

knowledge through hands-on activities and simulations, students research and design potential solutions to these true-to-life challenges.

- **Principles of Biomedical Science (PBS, 80 Hours Class time)**

In the introductory course of the PLTW Biomedical Science program, students explore concepts of biology and medicine to determine factors that led to the death of a fictional person. While investigating the case, students examine autopsy reports, investigate medical history, and explore medical treatments that might have prolonged the person's life. The activities and projects introduce students to human physiology, basic biology, medicine, and research processes while allowing them to design their own experiments to solve problems.

- **Human Body Systems (HBS, 80 Hours Class time)**

Students examine the interactions of human body systems as they explore identity, power, movement, protection, and homeostasis. Exploring science in action, students build organs and tissues on a skeletal Maniken®; use data acquisition software to monitor body functions such as muscle movement, reflex and voluntary action, and respiration; and take on the roles of biomedical professionals to solve real-world medical cases.

- **Medical Interventions (MI, 80 Hours Class time)**

Students follow the life of a fictitious family as they investigate how to prevent, diagnose, and treat disease. Students explore how to detect and fight infection; screen and evaluate the code in human DNA; evaluate cancer treatment options; and prevail when the organs of the body begin to fail. Through real-world cases, students are exposed to a range of interventions related to immunology, surgery, genetics, pharmacology, medical devices, and diagnostics.

- **Biomedical Innovation (BI, 80 Hours Class time)**

In the final course of the PLTW Biomedical Science sequence, students build on the knowledge and skills gained from previous courses to design innovative solutions for the most pressing health challenges of the 21st century. Students address topics ranging from public health and biomedical engineering to clinical medicine and physiology. They have the opportunity to work on an independent design project with a mentor or advisor from a university, medical facility, or research institution.

- **Engineering Design and Development (EDD, 80 Hours Class time)**

The knowledge and skills students acquire throughout PLTW Engineering come together in EDD as they identify an issue and then research, design, and test a solution, ultimately presenting their solution to a panel of engineers. Students apply the professional skills they have developed to document a design process to standards, completing EDD ready to take on any post-secondary program or career.

Excused Absences

Students need to notify the professor of absences prior to class when possible. *Senate Rules 5.2.4.2* defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and

(e) other circumstances found to fit "reasonable cause for nonattendance" by the professor.

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Two weeks prior to the absence is reasonable, but should not be given any later. Information regarding major religious holidays may be obtained through the Ombud (859-257-3737, http://www.uky.edu/Ombud/ForStudents_ExcusedAbsences.php.

Students are expected to withdraw from the class if more than 20% of the classes scheduled for the semester are missed (excused) per University policy.

Per *Senate Rule 5.2.4.2*, students missing any graded work due to an excused absence are responsible: for informing the Instructor of Record about their excused absence within one week following the period of the excused absence (except where prior notification is required); and for making up the missed work. The professor must give the student an opportunity to make up the work and/or the exams missed due to an excused absence, and shall do so, if feasible, during the semester in which the absence occurred.

Academic Integrity
Per University policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the University may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found at the following website: http://www.uky.edu/Ombud. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

Senate Rules 6.3.1 (see http://www.uky.edu/Faculty/Senate/ for the current set of *Senate Rules*) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording, or content from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work (including, but not limited to a published

article, a book, a website, computer code, or a paper from a friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work, which a student submits as his/her own, whoever that other person may be. Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone.

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content, and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas, which are so generally and freely circulated as to be a part of the public domain.

Please note: Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

Accommodations due to disability
If you have a documented disability that requires academic accommodations, please contact the University of Kentucky PLTW office at info@pltwky.org. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. It is located on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407. You can reach them via phone at (859) 257-2754 and via email at drc@uky.edu. Their web address is http://www.uky.edu/StudentAffairs/DisabilityResourceCenter/.

Day	Estimated Time	Unit	Learning Event	Deliverables	CTI check	ePorfolio	LMS	Due Date	Comments
Day 0	12:00 PM - 2:00 PM		Site Check-in, Registration and Welcome						
	2:00 PM - 5:00 PM		Introductions Course Overview in LMS/Review Assignment List Scope and Sequence Participant Progress Report						
			General discussion/ Readiness training Inventor as a TOOL and Lynda.com						
			Hand out Engineering Notebooks/folders						
		1	Engineering Notebook.ppt						
		1	Brainstorming Solutions.ppt						
		1	Concept Sketching (sketch 2 items in class)	Activity 1.3 Concept Sketching		X	X	DAY 1	4 sketches of choice in EN. Scan and submit.
		1	Introduction Instant Challenge	Engineering Notebook entry		X	X	DAY 1	Complete in EN. Scan and submit.
	Homework		Complete assigned activities						
		1	Deep Dive videos on YouTube Part 1: https://www.youtube.com/watch?v=JkHOxyafGpE Part 2: https://www.youtube.com/watch?v=pVZ8pmkg1do Part 3 :https://www.youtube.com/watch?v=nyugyrCQTuw	Activity 1.5 Deep Dive					
			Day 0 Instructional Design: Balanced Assessment	IED Unit Balanced Assessment Plan		X	X	DAY 1	
DAY 1	8:00 AM - 10:00 AM	1	Peer assessment of concept sketches using Rubric	Instructional Assignment: A1.3 Concept Sketching Rubric				DAY 1	Provide feedback to peer
			Class discussion: Balanced Assessment in IED. Assessment strategies. Preview of instructional strategies applied in Core Training.						
			CTI: Model effective questioning and discussion techniques						
		ALL	Engineering Formula Sheet						
		2	Isometrics and Oblique Pictorials.ppt	Activity 2.1 Isometric Sketching			X	DAY 2	Complete in EN. Scan and submit.
		2	Perspective Sketching.ppt	Activity 2.2 Perspective Sketching					
	10:00 AM - 12:00 PM	3	SI Measurement System.ppt	Activity 3.1a Linear Measurement SI #10, 11 and CQ			X	DAY 2	Complete in EN. Scan and submit.
		3	US Customary Measurement.ppt	Activity 3.1b Linear Measurement US # 8 - 11 and CQ			X	DAY 2	Complete in binder/EN. Scan and submit #11 only
	1:00 PM - 3:00 PM	3	Unit Conversions.ppt	Activity 3.2 Unit Conversions	X			DAY 2	Complete in binder.
		3	Dial Calipers.ppt	Activity 3.3 Making Linear Measurements	X			DAY 2	Complete in binder.
	3:00 PM - 5:00 PM	4	Participants will begin Project 4.1 Puzzle Design Challenge	Project 4.1 Puzzle Design Challenge		X		DAY 5	For Peer Review on day 5. Do not submit to ePortfolio until after review.
		4	Puzzle Cube Design	Activity 4.1.a Puzzle Part Combinations				DAY 2	Submit with Project 4.1
	Homework		Computer Modeling	Activity 3.1b #11 in Inventor	X			DAY 2	Visual Check on screen. CTI check physical properties, provide feedback.
			Day 1 Instructional Design: Instructional Intervention			X	X	DAY 2	
			Graphical Modeling	Activity 4.1.b Graphical Modeling #1-3	X			DAY 2	Will complete activity tomorrow
			Modeling.ppt						
			CTI: Prepare to provide participants with puzzle pieces or to build (tape together) puzzle pieces for A 2.3 tomorrow						
			CTI: Select/coordinate 9.3 Virtual Design Challenge with partner CTI.						

Day	Estimated Time	Unit	Learning Event	Deliverables	CTI check	ePortfolio	LMS	Due Date	Comments
DAY 2	8:00 AM - 10:00 AM		Class discussion: Instructional strategies to improve student learning related to unit conversions and using units to solve problems.						
			CTI: Model effective questioning and discussion techniques						
			Set up ePortfolio						
			CAD Instruction - Automoblox Wheel/ Windshield	Activity 5.2.b.A Intro to CAD Modeling Skills #v and #VIII	X			DAY 3	CTI visual check on screen, provide feedback.
	10:00 AM - 12:00 PM		Line Conventions.ppt	Activity 2.3 Glass Box					
			Multi-view Sketching.ppt	Activity 2.4 Multi-view Sketching # 6 - 8			X	DAY 3	Complete in EN. Scan and submit
			Graphical Modeling	Activity 4.1.b Graphical Modeling	X			DAY 3	Complete in EN for review.
	1:00 PM - 3:00 PM		Inferential Statistics.ppt	Activity 3.6 Instant Challenge: Fling Machine Conclusion Questions (using data from Readiness Training or data supplied by CTI)		X	X	DAY 3	Complete in EN. Scan and submit
			File management - Puzzle Cube, Automoblox, Button Maker						
			CAD Modeling	Activity 5.5a CAD Model Features Part 1	X			DAY 4	CTI visual check on screen.
	3:00 PM - 5:00 PM		CAD Modeling						
	Homework		Complete Daily Instructional Evaluation. Complete assigned activities						
			Statistical Analysis with Excel.ppt	Activity 3.7 Statistical Analysis with Excel Part 3 for Fling Machine data only		X	X	DAY 3	Submit Excel file to LMS.
			Puzzle Cube Challenge	Model puzzle cube parts	X				
			Day 2 Instructional Design: Identifying Similarities and Differences			X	X	DAY 3	

Day	Estimated Time	Unit	Learning Event	Deliverables	CTI check	ePortfolio	LMS	Due Date	Comments
DAY 3	8:00 AM - 10:00 AM		Share/discuss Instructional Design assignment and additional instructional strategies to enhance learning related to Descriptive versus Inferential statistics						
			Exchange puzzle cube designs per A4.1b (#4) and provide feedback (#6)	Activity 4.1b Graphical Modeling					Submitted with Project 4.1
			CAD Modeling Q & A - puzzle parts/Activity 5.5a						
	10:00 AM - 12:00 PM	3	Precision and Accuracy.ppt						
		3	The Empirical Rule.ppt	Activity 3.8 Precision and Accuracy of Measurement			X	DAY 4	
			CTI: Choose two dial calipers for Activity 3.8 #2 and provide data tables. When complete, scan and post data tables in LMS so that participants have access in order to complete A3.8 tonight.						
		3	Measure gage blocks (A3.8)						
		3	Gather wooden cube measurement data (A3.9)	Activity 3.9 Statistics and Quality			X	DAY 4	Submit Excel file and answer to #4, 5, 6 and CQ.
	1:00 PM - 3:00 PM	4	Assembly Constraints.ppt						
		4	Assembly of puzzle cube	Project 4.1 Puzzle Cube Challenge					
	3:00 PM - 5:00 PM	3	Introduction to Dimensioning.ppt	Activity 3.4 Linear Dimensioning # 5, 6, 8 in EN				DAY 4	Review the entire activity. Reproduce #5,6 and 8 in Engineering Notebook for peer review.
		3	Dimensioning Guidelines Handout						
	Homework		Complete Daily Instructional Evaluation. Complete assigned activities						
			Build physical models of puzzle cube pieces, color						
			Complete puzzle piece Inventor part models and assembly						
			Day 3 Instructional Design: Advance Organizer			X	X	DAY 4	
DAY 4	8:00 AM - 10:00 AM		Peer review of Activity 3.4 drawings in EN [Use dimensioning guidelines as an assessment guide.]	Activity 3.4 Linear Dimensions					Reviewer: Provide corrective feedback Designer: Make corrections as needed.
			CTI: Compile a list of Unit 1 through 3 Analogies and Metaphors submitted for Day 3 Instructional Design assignment. Upload to shared drive.						
		4	Puzzle Cube solution time tests (per P4.1 #12 only 5 subjects required)	Project 4.1 Puzzle Cube Challenge					
	10:00 AM - 12:00 PM	4	Mathematical Modeling.ppt	Activity 4.1c Mathematical Modeling **(Part 3 only)**			X	DAY 5	Submit an Excel file in LMS (to include text and or calculations to answer the questions in activity).
		4	Creating Drawings in CAD.ppt						
		4	Work on Puzzle Cube Project - format and annotate drawing files						
	1:00 PM - 3:00 PM	4	Work on Puzzle Cube Project - complete all requirements #1-19						
	3:00 PM - 5:00 PM	5	Work Points Axes Planes.ppt						
		5	CAD Modeling DEMO	A5.5b CAD Model Features Part 2	X			DAY 6	You have the weekend to complete this assignment
	Homework		Complete Daily Instructional Evaluation. Complete assigned activities						
			Day 4 Instructional Design: Homework				X	DAY 5	For peer review on Day 5
			CTI: Revise Day 4 Instructional Design assignment to include due date (tomorrow at 8am)						
		4	Mathematical modeling of puzzle solution times	Project 4.1 #13, 17 and 18	X			DAY 5	For peer review on Day 5.
		5	Geometric Shapes and Areas.ppt	Activity 5.1 Calculating Properties of Shapes					Review
		4	Complete Project 4.1 Puzzle Cube Challenge					DAY 5	For peer review on Day 5. Do not post to ePortfolio before review tomorrow am.

Day	Estimated Time	Unit	Learning Event	Deliverables	CTI check	ePortfolio	LMS	Due Date	Comments
DAY 5	8:00 AM - 10:00 AM	5	Discuss challenges with A5.5CAD Model Features						
			Discuss challenges with other assignments this week.						
		4	Peer review Project 4.1 Puzzle Cube Challenge	Project 4.1 Puzzle Cube Challenge Rubric as appropriate to CT project	X			DAY 5	Author: Revise per feedback and add to ePortfolio. **Due before midnight tonigh**t.
	10:00 AM - 12:00 PM	5	Determining Density.ppt	Activity 5.3 Determining Density Part II (and Part I as directed by CTI)			X	DAY 6	Submit Excel spreadsheet.
		5	Properties of Geometric Solids.ppt	Activity 5.4 Calculating Properties of Solids #1 and #2			X	DAY 6	
	1:00 PM - 3:00 PM	6	Preview of Unit 6 - Reverse Engineering Set up RE Groups for project - maximum 3 persons/group	Project 6.5 Reverse Engineering Presentation					This project does **not** require assembly or extensive dimensioning.
			CTI: Populate Reverse Engineering Groups (RE Groups 1 - 8) in LMS either manually or automatically.						
		6	Reverse Engineering.ppt	Project 6.3 Functional Analysis					To be included in P6.5 submittal
		6	Product Disassembly.ppt	Activity 6.4 Structural Analysis of Automoblox					To be included in P6.5 submittal
		6	A 6.4 Product Disassembly Material Usage Chart	A 6.4 Product Disassembly Chart					To be included in P6.5 submittal
	3:00 PM - 5:00 PM	5	Physical Property Analysis.ppt	Activity 5.6 Physical Property Analysis					
		6	Work on Reverse Engineering Presentation	Project 6.5 Product Reverse Engineering Presentation AUTOMOBLOX with partner	X		X	DAY 6	Complete and submit to LMS per CTI instruction before 8 am Monday. Do not submit to ePortfolio until after review.
			Direct participants to Simple Machines.ppt (if needed)						
			Share Skype names within the class. Verify webcam connectivity [DEMO]						
			Share Skype names with Virtual Project sister site						
			CTI: Edit Project 6.5 to reflect due date, Monday at 8am						
			CTI: Portfolio Check. Students should be up to date with Week 1 work.						
	Homework		Participants should identify all work from week 1 that is incomplete and complete the work for Monday morning						
		6	Elements and Principles of Design.ppt	Activity 6.1 Elements and Principles of Design Identification					
				Activity 6.2 Visual Analysis					To be included in P6.5 submittal
			Day 5 Reflective Question: Biggest challenges			X	X	DAY 6	
			Complete Daily Instructional Evaluation. Complete assigned activities						
			Peer review of Day 4 Instructional Design: Homework			X	X	DAY 6	Reviewer: Review and provide feedback through peer review feature of LMS. Designer: Revise assignment based on feedback and submit to ePortfolio.

Day	Estimated Time	Unit	Learning Event	Deliverables	CTI check	ePortfolio	LMS	Due Date	Comments
DAY 6	8:00 AM - 10:00 AM		Class Discussion: Barriers to implementation of CEA						
		6	Peer Review of Project 6.5 [Each participant will review one project; therefore, there should be two reviews per project]	Project 6.5 Produce Reverse Engineering Presentation Rubric		X		DAY 6	Reviewer: Document feedback using P 6.5 Rubric and provide to peer. Designers: Revise project per feedback of two peers and add to ePortfolio
		7	Introduce Problem 7.7 Product Improvement	For discussion only. Do not complete.					Not Graded
			CTI: Provide guidance and examples of Problem 7.7 products from your classroom						
			Dimensioning Standards.ppt	Activity 7.1 More Dimensioning			X	DAY 7	
		5	CAD DEMO/ Difficulties with A5.5 How to save drawing as PDF Dimensioning tips and tricks						
	10:00 AM - 12:00 PM	7	Alternate Views.ppt Holes and Hole Notes.ppt	Activity 7.2 Section Views (#1 thru #5)	X		X	DAY 7	Complete #1-3 in binder. Complete #4 in EN. Numbers 1 - 4 to be visually checked by CTI. Submit only pdf of part drawing for #5 in LMS.
	1:00 PM - 3:00 PM	7	Tolerances .ppt	Activity 7.3 Tolerances #1,2, 5 and 6	X		X	DAY 7	Complete #1, #2, #6 in binder to be checked by CTI. Submit a pdf of part file for #5 only to LMS
			Day 6 Instructional Design: Nonlinguistic Representation (tolerances), In small groups [DAY 6 Groups in LMS],	Tolerance Concept Map		X	X	DAY 7	Only one person in your DAY 6 Group need submit the assignment in the LMS, but all must upload to their ePortfolio individually.
			CTI: As teams work on Instructional design, assist with subgroup team member sign-up for DAY 6 subgroups in LMS. Model good "facilitation" techniques.						
	3:00 PM - 5:00 PM	7	Documentation.ppt						
			Assembly Constraints.ppt	Activity 7.4 Assembly Models					
			CTI: Facilitate the assignment of each sub-assembly of the Button Maker to a member in each DAY 6 Group. Some members may be responsible for more than one sub-assembly. Emphasize file management and communicate that group member should save part files AND assembly files for their subassembly to Files from the Home page of their group. Be sure ALL Button Maker parts are available for use so that participants are not required to create parts files.						Note: The Day 6 Instructional Design: Nonlinguistic Representations, and the Project 8.1 Model a Button Maker will both be completed in the same DAY 6 LMS Group.
	Homework		Complete Daily Instructional Evaluation. Complete assigned activities						
		7	Create working drawings for Automoblox vehicle	Project 7.5 Engineering Documentation Automoblox		X	X	DAY 8	Submit PDF of drawings as instructed by CTI to LMS. Submit all Inventor part, assembly and drawing files to ePortfolio.
		8	Create assigned (one or two) sub-assembly of Project 8.1 Model Button Maker	Project 8.1 Model Button Maker (assembly of parts only)				DAY 9	You should have access to all Button Maker parts. You are required only to create the assigned subassembly (no part drawings). DO NOT submit files. Remember that you have full access to Lynda.com for software training
			CTI: Edit Day 6 Instructional Design: Develop an Assessment Item assignment to show due date of 8 am tomorrow						
			CTI: Assign learning objective per Day 6 Instructional Design assignment prior to leaving today.						
			Day 6 Instructional Design: Develop an Assessment Item				X	DAY 7	due by 8 am tomorrow for peer review

Day	Estimated Time	Unit	Learning Event	Deliverables	CTI check	ePorfolio	LMS	Due Date	Comments
DAY 7	8:00 AM - 10:00 AM		Peer review of Day 6 Instructional Design Assessment Items - check LMS for automatic peer assignment	Completed rubrics and comments per LMS instructions.			X	DAY 7	
			Day 7 FINAL Assessment Item Submittal [Revise Day 6 Instructional Design Assessment item per peer reviews	Revised IED Multiple Choice Item Template		X	X	DAY 7	due by 8 pm TONIGHT. Be sure to add your item to the PLTW IED item bank per instructions in LMS assignment.
			CTI: Edit Day 7 FINAL Assessment Item assignment due date - 8 pm tonight						
			CTI: Demonstrate file submittal to FINAL Assessment Items group Files in LMS and PLTW IED Item Bank.						
			CTI: Instruct participants to upload Button maker parts and subassembly files to DAY 6 Group files						
		8	Parametric Modeling.ppt [and DEMO]	Activity 8.2 Parametric Constraints #2 only			X	DAY 8	Submit Inventor part file (.ipt) to LMS
	10:00 AM - 12:00 PM	9	Global, Human and Ethical Impacts.ppt						
			Activity 9.1 Product Lifecycle						
			Activity 9.2 Design Ethics Design Brief						
	1:00 PM - 3:00 PM	9	Review project implementation options & strategies						
			Review all project documents with class Review list of possible design briefs Explain project focus and deliverables [DEMO]	Project 9.3 Virtual Design Challenge		X		DAY 9	
			Project 9.3 Virtual Design Challenge Work Time						
	3:00 PM - 5:00 PM	9	Decision Matrix .ppt						
			Gantt Chart.ppt						
			Teamwork.ppt						
			Project 9.3 Virtual Design Rubric						
			Project 9.3 Virtual Design Challenge Work Time continued						
	Homework		Complete Daily Instructional Evaluation. Complete assigned activities						
		7	Create working drawings for Automoblox vehicle	Project 7.5 Engineering Documentation Automoblox		X		DAY 8	Per CTI instruction
		8	Complete sub-assemblies (as assigned by CTI) for Project 8.1 Model a Button Maker		X			DAY 9	Due Day 9
			Virtual Design Project preliminary sketches					DAY 8	
			Day 7 Instructional Design: Develop a Discussion Question			X	X	DAY 8	
			CTI: Choose exemplar Assessment Items (at least 5 items) and create short quiz in LMS that participants will take on Day 8 for homework.						

Day	Estimated Time	Unit	Learning Event	Deliverables	CTI check	ePorfolio	LMS	Due Date	Comments
DAY 8	8:00 AM - 10:00 AM		Class discussion: Essential Question - What does it mean to be ethical in your work? Do engineers need to be trained to be ethical? If so, how do we accomplish this?						
			CTI: model effective questioning techniques						
		8	Assemble Button Maker						
		8	Exploded CAD Assembly Models.ppt						
		8	Animating Assembly Models.ppt						
		8	Review Activity 8.4 Working Drawings Button Maker	Exploded view of one Button maker sub-assembly with balloons				DAY 9	Not graded
	10:00 AM - 12:00 PM	9	Project 9.3 Virtual Design Challenge work time						
	1:00 PM - 3:00 PM	9	Project 9.3 Virtual Design Challenge work time						
	3:00 PM - 5:00 PM	9	Project 9.3 Virtual Design Challenge work time						
	Homework		CTI: Compile and post/share Discussion Questions (Day 7 Instructional Design submittals) for use as an Instructor's Discussion Guide for IED Unit 9..						
			Take Common Assessment Quiz created by CTI in LMS This quiz includes items created by the class				X		As instructed by CTI
			Complete Daily Instructional Evaluation. Complete assigned activities						
DAY 9	8:00 AM - 10:00 AM		Class Discussion: Quiz results. Demonstrate LMS feedback for quiz results. How would you use these results to inform instruction?						
		9	Project 9.3 Virtual Design Challenge work time						
	10:00 AM - 12:00 PM	9	Project 9.3 Virtual Design Challenge work time						
	1:00 PM - 3:00 PM	9	Project 9.3 Virtual Design Challenge work time						
	3:00 PM - 5:00 PM	9	Project 9.3 Virtual Design Challenge work time						
	Homework		Complete Virtual Design Challenge	Project 9.3 Virtual Design Challenge		X		DAY 9	Submit by 6 pm today.
			Complete Daily Instructional Evaluation. Complete assigned activities						
			Day 9 Final ePorfolio Submission to Instructor(s)			X	X		
			Day 9 Reflective Question: Course Goals				X		
DAY 10	8:00 AM - 10:00 AM		Assessment presentations						
			End of Training Survey				X		
			Advanced Inventor Skills						
	10:00 AM - 12:00 PM		Course Conclusion						
			Portfolio Review						
			Participant/instructor interviews						
			Download ePortfolio						

Participant Expectations

To support and strengthen instructional practices and content knowledge related to each PLTW course, PLTW teachers participate in a three-phased professional development model. The model provides teachers with learning opportunities that emphasize proper preparation, in-depth training, and continuing education. The three phases of the model are Readiness Training, Core Training, and Ongoing Training.

What is Readiness Training?

Readiness Training (RT) is online professional development that is intended to provide background information related to the PLTW program and instructional philosophy important to course content and pedagogy. In addition, some content and/or software-specific knowledge and skill training is provided in Readiness Training in order to provide prerequisite skills needed to complete Core Training requirements.

Readiness Training may be completed at the convenience of each participant **prior** to arriving at Core Training. It is expected that participants **complete all** Readiness Training (including the completion and submission of all assigned tasks, quizzes, and discussion responses as indicated in the modules). A list of all Readiness Training assignments, quizzes, and required discussion responses is provided in a separate document.

What is Core Training?

Core Training (CT) is an intense and immersive professional development experience offered at a PLTW Affiliate University. The focus of CT is to enhance participant skills and knowledge related to course-specific pedagogy and content. CT is designed to empower teachers with the confidence, understanding, and knowledge necessary to teach the curriculum. A teacher may teach a PLTW course only after **successfully** completing the corresponding CT training.

What is the pace of Core Training?

CT for PLTW Engineering, PLTW Biomedical Science, and PLTW Computer Science is an 80 hour instructional program. PLTW Gateway instructional programs are taught in 24 or 34 hour sessions. Core Training will cover major course concepts and methods, but not the entire curriculum. The pace of instruction is accelerated and rigorous with little time for outside distractions during training. In order for a participant to successfully complete CT and be certified to later teach the curriculum within his/her own classroom, he/she must meet the expectations as outlined below.

What is the time commitment?

Beyond the time spent during in-class instruction, participants should plan to spend multiple hours on homework each night and over the weekend, if they plan to successfully complete CT. The time required

to complete CT assignments will vary based upon each participant's knowledge of the topic and previous experience.

To ensure that participants devote their full attention to the mastery of coursework and work collaboratively on project assignments, it is strongly recommended that participants stay on campus for the duration of CT. Staying on campus allows teachers to work together during the evening and to have access to additional help that is provided by the Core Training Instructors (CTI). Due to the accelerated pace of CT, the only time for additional assistance will be in the evenings or on weekends. Most participants find living on campus to be an enriching experience and take advantage of the focused environment, free from the rest of life's distractions.

Am I ready to teach?

All participants at CT are required to maintain a portfolio which includes a variety of documents and completed works as assigned by the CTI. The CTI will periodically review and sign off on completed portions of the portfolio over the duration of CT.

The portfolio is a collection of selected coursework and other instructional materials associated with the course that is completed or created during RT and CT. The portfolio provides evidence that the participant has successfully completed RT and CT requirements. A CTI will review the artifacts and document completion when the participant demonstrates adequate competency with the associated concept(s) and skills. Simply including the artifact in the portfolio without demonstrating proficiency is not sufficient.

CT provides a comprehensive overview of the course content and is not inclusive of the full scope and breadth of the course. Due to time constraints, CT provides an introduction to select activities, projects, and problems within the course as well as pedagogical strategies. Prior to teaching the course, it is the responsibility of participants to thoroughly familiarize themselves with the entire course curriculum.

What is expected of me?

To ensure a successful training experience, the following participant expectations have been established.

Prior to Core Training

• Complete all PLTW Professional Development Readiness Training modules as outlined on the course-specific PLTW Learning Management System (LMS) by 11:59pm ET on the Thursday prior to the first day of Core Training.

 • _On the laptop that will be brought to CT_, download and install all required course-specific Core Training software as outlined in the professional development course on the PLTW LMS.

During Core Training

• Arrive on opening day, usually a Sunday, with a laptop that meets or exceeds PLTW computer specifications, as outlined in the [Computer Requirements (Links to an external site.)](#) document, with required course-specific software already loaded.

• Establish network access at the training site.

• Arrive on time to all daily class sessions (attendance will be taken twice daily).

• Actively participate in classroom instruction.

• Complete all required assignments.

• Assemble a PLTW Professional Portfolio, according to expectations provided.

• Turn off all cell phones during classroom instruction unless absolutely necessary. If critical, attend to necessary calls outside of the classroom.

• Treat all participants and instructors professionally and with respect.

It is the participant's full responsibility to successfully meet all CT expectations, complete a PLTW Professional Portfolio, and to become competent in the full scope of the specific PLTW curriculum and related instructional practices prior to instructing any students.