This is your latest Newsletter for your current choices, unless you have opted out.

Welcome to the Spring 2024, IE665, The On-line/Distance eLearning Class: Concurrent / Simultaneous Engineering / Product Lifecycle Management & Sustainable Green Systems Engineering Management, to Prosper and Become Successful Innovator & Entrepreneur in this Engineering Management Domain.

(Please note, that ALL eLearning Resources for this course are now on-line, on a server in the Internet and they are **all FREE** to the Student students. The package is often referred to as the 'eLearning Pack' in this syllabus, and some of the videos as 'DVDs', nevertheless they are all on-line, streamable digital resources.)

Learn About **Concurrent / Simultaneous Engineering**, Systems Engineering, Integrated Product / Process Innovation, Creativity and **Entrepreneurship**, Lean and Sustainable Green Product Design & Development, Integrated Product Lifecycle Management, Product Data Management, Computer Aided Design, Manufacture & Analysis (CAD/CAM/CAE), and Design Rule Product Lifecycle Management and Digital Design & Digital Manufacturing, Digital Product Simulation, Rapid Prototyping, Rapid Tooling, Rapid Manufacturing, Product Quality Engineering, Quality Function Deployment, Design for Manufacture, Design for Assembly, Design for Quality, Design for Reliability, Design for Virtual Factory Teams, and Case Studies. The Industrial Internet of things (in this course with a strong integrated systems engineering / design focus) is always changing, emerging smart sensorized machines, big data and cloud computing, cyber security, and artificial intelligence (machine learning) are now being integrated into the product lifecycle management and product data management systems, and the Internet of Things (IoT) is now being added to the Virtual Factory Teams and Case Studies. The Industrial Internet of things (in this course with a strong integrated systems engineering / design focus) is always changing, emerging smart sensorized machines, big data and cloud computing, cyber security, and artificial intelligence (machine learning) are now being integrated into the product lifecycle management and product data management systems, and the Internet of Things (IoT) is now being added to the Virtual Factory Teams and Case Studies.

- Innovation & Creativity
- Entrepreneurship
- Product Design & Development
- Product Lifecycle Management
- Sustainable Green Engineering

We are going to have a lot of fun, learning aspects of our organizing, planning and 'nuts, bolts'.

Hey! by Rocky Pell
Lecturer, Stanford University
Member of the American Society for Quality (ASQ), Audit Division and Lean Enterprise / Advanced Manufacturing Divisions
Member of the Institute of Electrical & Electronics Engineers (IEEE), Computer Society
Member of the Institute for Operations Research and the Management Sciences (INFORMS)
Member of the Society of Manufacturing Engineers (SME)

"Tis an adventure, as well as practical course. Every subject we discuss is supported by real-world industrial WIN-TIGHEngineers and some textbooks. You can discuss analytical methods, examples and tools but to help you learn and understand.

Please note, that this course is integrating ALPI's Service, learning principles, methods and guidelines in several different ways.

What is Service-Learning?
Service-learning is an educational approach to combine learning objectives with community needs.
It is a learning strategy integrating meaningful community service with academic instruction, emphasizing critical reflection, civic responsibility, and "sense of caring" in students.
ALPI defines Service-learning as a process whereby students learn and develop through active participation in organized service experiences that meet community needs. Successful involvement in community-based service experiences promotes the exploration of civic responsibilities, career options, and personal values and development of a lifelong commitment to service.

What are the Benefits of Service-Learning?
"Ask not what Hogan, Rauch and Pell can do for you, but what they can do for a team", quoth Benjamin Franklin.
Benefits include:
- Integrates classroom learning and community service in an active and lasting way that demonstrates the relevance and importance of academic work for their life experience and career choices.
- Offers valuable and considerable career guidance and experience.
- Enhances the ability to work with people of diverse backgrounds.
- Promotes a sense of caring for others and a commitment to civic responsibility.
- Fosters a lifelong commitment to volunteerism and community service.

Service-learning is not volunteerism or an internship, it is a learning process that combines service with classroom learning to meet identified community needs.

Please read the detailed syllabus below, to see and understand how these principles are integrated into the course.

We want to make exactly the same, or even better, learning experiences as we have in previous years, except that we plan to do it even further. Our emphasis is not further management, nor by budgets. Many of our mentors and students are now working remotely, and we want to continue to include them in our teaching and learning environments, if possible.

We have to be nimble and be able to understand how the methods taught in this course are relevant (and current) to innovative product design, manufacture, and lifecycle support of products, but also to a range of services and systems, and to understand how to be successful in a new or existing enterprise, or to be an entrepreneur, or to be a successful intrapreneur in a large enterprise.

The engineering processes given the entire product lifecycle that includes conceptual design, preliminary design, detailed design, and integration and test. Design processes continue to be applied through product manufacture, product support, and even product disposal. Design is a process that is iterative and incremental, and it is a process that is not linear, it is a process that is iterative and incremental, and it is a process that is not linear.

Design is a process of making and improving plans for the construction of new products, services, and systems (collectively called "products" in this class). The identity of the products being designed may be quite fuzzy, but it still exists. Design of physical products depends on a world design discipline that uses mathematical advanced development cost and schedule impacts, to organize and integrate a engineering change process can be an indicator of the level of integration of the engineering organization.

In this course learn about how to develop and sustain design and product development processes, Systems Engineering, Integrated Product / Process Innovation, Creativity, Entrepreneurship. Very good video clips from the history of the Apple Mac, https://www.youtube.com/watch?v=ZfKcC0Nf6aI

Cost Data of Designers: **PLM is the Cheap! Digital design, analysis, manufacturing support.**

A few words about...

Innovation

Innovation Integrity. Please refer to ALPI's Academic Integrity web site that contains much information about strategies to promote academic integrity and avoid cheating on class work and exams. Also, please refer to the Academic Integrity section of the Student Handbook for information about the University's policy on academic integrity.

During the 2006-2008 academic year the ALPI Administration worked with students and the Student Senate to enhance awareness and faculty's Honor Code. The Committee on Academic Affairs and the SUT Faculty approved the Student Senate's recommendation to adopt the Honor Code. The Student Senate and the Committee on Academic Affairs also recommended that the Honor Code be posted in all classrooms. The Faculty agreed.

Cheating on exams and other forms of academic dishonesty are very serious offenses and can be cause for dismissal from the University. The identity of the cheating student will be known to all students. Such dishonesty violates the University's Honor Code.

PLEASE save the **TREES and be sustainably lean and green!** Please DO NOT Print this syllabus. Use the computer to read the electronic format. It will be updated during the semester. Thank you!

Some most famous of this class, that are going to help you to survive a crazy 21st century known professional...

- Steve Jobs, Co-founder and Chairman of Pixar Animation Studios, CEO of Apple Computer
- Steve Jobs, on how to create innovative and successful products
- Innovate, Innovating or Innovation technology, not just a word
- Innovation is not a process, it is a mindset
- Innovation is not a process and it is not a mindset
- Innovation is not a process, it is a process
- Learn to write executive summaries
- Learn to write executive summaries
- Learn to write executive summaries
- Learn to write executive summaries, and learn how to write executive summaries
- Learn to write executive summaries, and learn how to write executive summaries, and learn how to write executive summaries
- Learn to write executive summaries, and learn how

- **Machine intelligent, smart devices and add-ons offer our future greats.** While we do not create world-class physicists in the class, individual student designs produce their own fabulous elements in their project work. Small, inexpensive add-on devices can be made by students and used in their projects.
- **Brain-totally because products change all the time.** We are not immersed in the class. Individual students take pride in their skills and products their own brains. By doing so they understand the importance of brain-totally.
- **Intelligent and Sustainable Buildings.** Buildings are responsible for 40% of our carbon footprint. This is because everything is heat, cooling and electricity. Intelligent buildings offer vision - Some examples of intelligent buildings are: Sensors that switch off lights when no-one is in a room. Sensors that open windows when it is too hot. Sensors that open blinds to let in light and heat.
- **Renewable energy prices are dropping very quickly due to efficiency increases and new research in new green warming.** Alternative energy sources are becoming very cheap, quite a lot 40% efficient, to 18% in 5 years. Alternative energy sources are becoming very cheap. This is a realistic possibility. Solving this problem is the challenge for our future.

Covid-19 is changing everything!

Covid-19 has changed everything. Lockdown today from 5 to 6 2021, nevertheless the above principles are still very many years because they provide week-to-week, volume-to-volume unemployment-proof engineering and systems, quality, innovation and sustainability. Lockdown has shown that we can do everything online. Lockdown has shown that we can be productive. Lockdown has shown that we can be productive. Lockdown has shown that we can be productive

Methodology

Version PLUS Software

Furthermore, as you study the great advice and tasks, consider the following:

Lots of great information is available on the Internet, including Wikipedia, both assuming and as non-trusting, related to product, solution, system, process, IT, and/or service during its life span. A great place to begin is Google, Wikipedia, Yahoo!, http://www.bing.com/search?q=product+lifecycle+management+plm+solutions+plm+software+solutions

Lots of great information is available in the business and technical literature. Consultants and analysts usually have a bias, where a bias is business expertise, and with product development, extension, or engineering, they have a bias toward product development. Also, PLM is a business strategy, not just a software or technology initiative. Lots of great information is available from the PLM software vendors, but they have a bias.

Since by understanding the underlying theories and processes of environment engineering, the opportunities for saving valuable product/process design and development cost and time are huge, this an obviously close to 100% to one's success, PLM is a business strategy, not just a software or technology initiative, and PLM is a long-term journey, not just a short-term project.

Since PLM is a business strategy, not just a software or technology initiative, and since PLM is a long-term journey, not just a short-term project, and

- The Ranky-Weibull method / calculator is not used.

Class 10

Design For Manufacturing, Design For Green Sustainable Manufacturing, Quality, Assembly, KANRI, KAISEN, MUDA, MURA, MURI, POKA-YOKE, the role of Quality Circles, and other methods discussed with 3D Virtual Reality examples and classroom exercises. Rapid prototyping methods and solutions (Part 2).

Focus on the engineering related challenges/ questions, but most importantly on lean, sustainable green design. Try to answer 10 selected questions of your choice! Incorporate these answers into the Assignment below!

Class 11

Design for Demanufacturing, disassembly, Virtual Product Disassembly over the web, and other methods discussed with 3D Virtual Reality examples and classroom exercises. Rapid prototyping methods and solutions. Networked Concurrent Engineering systems in digital collaborative factories. Discussion on network modeling methods and tools. PLM (Product Lifecycle Management), NPI & I (New Product Innovation and Introduction).

Student Activities:

1. Carry on reading the book offered in the eLearning Pack.
2. **Based on the Rapid Prototyping eBook:** Focus on the engineering related challenges/ questions in this eBook.
3. Try to answer 10 selected questions of your choice! Incorporate these answers into the Assignment below!

Submit: Assignment No. 4: Sustainable Green Design for Manufacturing / Assembly / Environment Methods and Technologies Study

The students' main task is to pay attention to the multimedia presentations, to take notes on every important issue, item, principle, and example, to interact with the tutor (on Email, Fax, Telephone, etc.) and the class members (on Email, Fax, Telephone, etc.) and fully understand the topics covered.

Project/ Assignment No.4: Sustainable Green Design for Manufacturing / Assembly / Environment Methods and Technologies Study

1. In terms of assignment documentation method, please follow the Appendix of the eBook in your Learning Pack.
2. Title, Author (Name, Class, Date, and the 4 collab. companies you have (a MUST!)
3. Statement on who has done the work **EACH individual, and this is true for all assignments, must submit an assignment by himself/ herself!**
4. Contents
5. Introduction and Objectives of the Project
6. A brief description of the methodologies applied.
7. **The Main Body of the project:**
    1. Develop/ select/ identify your own company's Sustainable Green Design for Manufacturing / Assembly / Environment Methods and Technologies methods / model/ strategy using the list of methods offered in the 3D multimedia eBook in your eLearning Pack,
    2. Also, incorporate other green design and green manufacturing methods and tools you can find on the web, for the product that you are developing, in a collaborative fashion with the 4 companies you have to work with...
    3. Answer any selected 10 questions in **Chapter 3** of the eBook, by writing approximately 3-4 sentences on each with some optional sketches if necessary. **Address Design For Green, Manufacturing, Quality, Assembly, KANRI, KAISEN, MUDA, MURA, MURI, POKA-YOKE, the role of Quality Circles, Design for Demanufacturing, disassembly, Virtual Product Disassembly processes / methods.**
    4. Furthermore, research OTHER sustainable green product design, green PLM methods on the web. Explain the methods, principles, and main application areas in your assignment.
    5. Explain what 'digital twins' are? Why are they important? What can we do with digital twins and HOW? WHO creates digital twins and for waht purposes?
    6. Also, show how your (real or made up) company can collaborate globally in a CE / PLM environment, with the companies given you in your eLearning Pack (there are 4 companies you have to collaborate with; explain HOW you are planning to do this together with THEM. YOU MUST WORK WITH THEM; sorry; the boss says so...).
    7. **Last, but not least do not forget your social networking content.** (as above)
8. Summary (i.e. what has been achieved)
9. Further work needed/proposed
10. References and Bibliography (including the CDs, Internet as a main source of information)
11. Appendix (if necessary)

Typical Mistakes: Why am I loosing grade points in this assignment?

- The assignment's administrative section is missing, and/or incomplete...
- The above outline is NOT followed
- The models / solutions are copied from the samples offered; Sorry, you must innovate and create your OWN designs, and models.
- The collaborative companies are not included properly. Sorry, you MUST collaborate!
- The green PLM model /strategy is incomplete. Did not address Design For Green, Manufacturing, Quality, Assembly, KANRI, KAISEN, MUDA, MURA, MURI, POKA-YOKE, the role of Quality Circles, Design for Demanufacturing, disassembly, Virtual Product Disassembly processes / methods.

Class 12 and 13 (Don't worry, it's almost over...)

Concurrent Engineering / PLM Team management methods and issues. The TOPS method (The Ford Motor Company). Virtual teaming methods over the Internet. A 3D Virtual Reality web-based method and code is discussed in detail.

Student Activities:

1. Carry on reading the book offered in the eLearning Pack.
2. **Based on the eBook:** study collaborative teamwork opportunities. (This section links from the documentation methods chapter and has a series of important principles, that you can work with).
3. **Search for New Sustainable Green Product Innovation and Introduction** (NPI & I) methods, tools and technologies over the Internet. Try to collect at least 10 URLs with a short explanation of the method they cover.

Class 14 and 15 (Note, that Classes 14 and 15 are kept for Assignment related project improvements)

Submit: Assignment No. 5: Concurrent Engineering Product Design Review / Assessment and Improvements: New Product Innovation & Introduction (NPI & I) Challenges

-> Part 1: Innovative PLM Design, and

-> Part 2: PLM / Green and Sustainable Digital Design & Digital Manufacturing Transition Plan, Marketing Plan (Press Release of your new product/ process/ service)

Documentation Structure for Assignment #5

1. Author (Name, Class, Date, and the 4 collab. companies you have (a MUST!)
2. Statement on who has done the work.
3. Contents: List the main topics in this Assignment
4. **Part 0 of this assignment is to resubmit all reworked assignments** with detailed explanations on what did you improve based on my comments. Note, that statements, such as: 'based on the professors comments I have improved Assignment i, please find it linked here...' are not acceptable, since you haven't specified exactly what my comments were and what you did to improve your assignment. The reworked assignments must be hyperlinked here with a single URL link for each assignment you have reworked, so that I can find them easily. Please note, that at this stage of the course I have a lot to grade, therefore if you don't follow my instructions and structure, send me several emails with several files, still have no webpage (!!!) I might miss some of your valuable work... so, please help me, so that I can help you. As I go through your reworked assignments, I'll change the grade if you deserve it and then I'll add this to the total number of points you have earned in this semester in this class. Then, I start to grade your Assignment 5. This is my process and it is more than fair, since most profs. do not allow reworks...
5. **Part 1: 10% of 30%: Innovative Green PLM Design: The Main Body of the assignment:** Now that you have understood our green CE/PLM approach, focus on finding an existing non-sustainable green design and then changing that design to a new sustainable green product of your choice, like a new toy, automobile, machine, or... cell phone. Please note, that copy-paste jobs from the Internet will not be accepted! You have to come up with novel ideas!
6. Discuss the product/process innovation and introduction methods and process you would suggest your company to follow, based on what we have learned, based on your projects in this course, and the collaborative companies in your eLearning Pack. You can use any resources, including what we have learned, the library, the web, your company, anything legal...
7. **Search for New GREEN Product Innovation and Introduction** (NPI & I) methods, tools and technologies over the Internet. Try to collect at least 10 URLs with a short explanation of the method they cover.
8. Document your thoughts, methods, models, strategies and technologies that you plan to use in your future work. This essay should cover the above with a CORA requirements model for a new product, such as a **new** toy design, or cell phone, a design-oriented Failure Risk Analysis model for the **new** toy design, or cell phone and some explanations on the rapid proto. method/technology one should choose to prototype it. Include all aspects that you can address, i.e. hardware, industrial design, software, service and networking, functionalities, etc. Offer text explanations, plus figures, images, and digital media, as necessary to present your new cellphone design to a (virtual board of directors, i.e. the class and myself, over the web) for venture capital support (sorry, again all on a virtual basis only...).
9. Further work needed / proposed: What other methods could be integrated and HOW? How could you make your new product design to be that of a successful product in the marketplace? (We want to see you how you can innovate, and succeed using the learned and other methods!
10. **Part 2: 10% of 30%: PLM / Digital Design & Digital Manufacturing and Sustainable Green Transition Plan for a company of your choice: The Main Body of the assignment:** Now that you understand CE, PLM / Digital Design & Manufacturing, convert your company into a PLM Consulting Company, that specializes in turning traditional engineering businesses into modern, PLM/ Digital Design & Manufacturing companies. Create a true engineering management solution, covering the following:
    1. A **convincing lean and sustainable green design marketing plan** for the CEO / CTO that they should move into PLM / Digital Design & Manufacturing. Keep in mind, that many of them will raise the typical arguments, until it is too late not to go under: Our current systems are OK, no need to change... Green PLM is far above our budgets... We are already doing this, no need to change... We cannot change our CAD systems because all the files are in a different format and we'll loose everything we have designed during the past 10 years... Nobody wants to change our systems... Takes ages to learn a new PLM system, we haven't got the time and money to do this... We are not operating on a global basis, we don't need it... and others. You should advocate the innovation opportunities using a library of reusable objects, as well as parametric, generative design solutions using Additive Manufacturing and CNC (Computer Numerical Control / flexible / agile design for manufacturing methods. Develop your arguments in this direction... This is key for all of us to survive. (One of Toyota's key secret is that they create well designed and tested platforms populated with reusable objects / modules. For each new release they carefully and gradually adjust these reusable objects and change them as the market demands this change. They also test everything in the digital domain first, and develop everything in integration with manufacturing, assembly, quality control, maintenance, etc. in mind... In comparison, the traditional product design company would start from scratch with everything for each product release. As a result, whilst they release on new product at high cost and with mistakes, Toyota will release 3 or more with well tested reusable objects... Now you know!)
    2. A **transition strategy and process plan (use the ISO standard CIMpgr process modeling method).** You can assume, that the company already uses CAD / CAM, but most of it is a mix of 2D and 3D tools, and they are not integrated into a PLM level we saw in the DVDs in this course. (This plan should also include a PLM education plan: How would you educate PLM to the average small, medium and large size businesses?)
    3. Create an implementation and test plan
    4. Design a ROI plan (a simple plan will do at tghis stage) - make up all missing data.
11. **Part 3: 10% of 30%: Conduct a Video Conferencing and Social Networking session. Do not forget your social networking content.** (This is an executive summary, with a hyperlink to the rest of the material you have documented, based on discussions with your classmates on articles I have sent you by email, all on your web site, NOT in a separate file attached to an email! This part of the assignment reflects your active participation in the class based on discussions of the articles I am emailing you every week...) **For VC use SKYPE, ZOOM, Webex, Facetime, or whatever software you wish to use** (free over the web) VC with one of your classmates and discuss each others' designs. Try to create a collaborative sustainable green product design review team spirit and document your findings... This is what you should document professionally (pls. note, that if you don't document it as below I won't be able to five you teh extra grade points; sorry):
12.
    1. The purpose of the video-conferencing session is to conduct a virtual product design review? What is a product design review? How did you prepare your files for this web-based VC product design review?
    2. What were the most important steps in your product design review process?
    3. What software did you use for VC and how? (Must include 3-4 screen prints of the VC session as a proof.)
    4. What did you discuss and achieve during the VC session? (Offer a script of your discussions in professional English, not in *'hej dude whatsup'* language...)
    5. How do you like this video-conferencing approach for collaborative CE/PLM problem solving?
    6. What were the main challenges?
    7. What worked well, and what did not, and why?
    8. In comparison to a face-to-face visit, versus VC, what is the estimated carbon footprint saving to the environment? How did you calculate this result? (Hint: search the web, there are some really useful carbon footprint calculators for free!)
    9. What are **Green Engineering** benefits of using VC? More on **Green Engineering**: http://www.cimwareukandusa.com/All-Green/Ranky-GreenEngineering.html
13. **SOCIAL NETWORKING:** During the semester, I will email you several links to short technical articles, that are really important for you to follow and understand what is going on in the world in our subject area. This is particularly important to some foreign students who are not used to get their news via the Internet. You suppose to chose three of these articles (for every assignment, including this one, as well as the Midterm) and then discuss at least THREE (3) of them with at least one more member in your class, and then document your findings in your social networking part of EACH assignment. I would like to see that you are discussing the content of these articles. Usually in a semester I send out about 20-25 short and current articles to chose from. Through my editorial work with major journals I get hundreds of *just published* articles that I can choose from... I am looking for your executive summaries of the discussions you have documented with one or more of your classmates via tel., email, in-person, and/or video conferencing. These activities are all part of each assignment now and therefore should be documented in your web page as an executive summary, just as the rest of your assignments are. The detailed discussions of these articles could be saved on Moodle, or anywhere else (your choice), in a digital format. Your executive summaty in your assignment should hyperlink to the detailed discussions (where ever you have stored them). All in one; nice object-oriented principle; not zillions of separate files please!
14. References and Bibliography (Including books, articles, the Internet as a source of information, DVD-ROMs and the serial numbers you have used
15. Appendix (if necessary).
16. I need your FULL documentation electronically (preferred on the web as a URL, linking to your web-friendly files) **All submissions MUST be electronic = by email / with a web URL in it; NOT several separate files please; I cannot accept several separate files, sorry, this is the 21st Century... we live in a digital age... Please note, that the absolute last day to submit any assignment is May 6, 2024. Sorry, no delays are accepted because I cannot change NJIT's required grading due dates!**
17. **Schedule and due dates:** As above. The total course duration is 15 weeks. Students will be required to complete each assignment. Grade "A" for this class requires min. 90% total. I want to give you an 'A', BUT YOU must do the work at a high quality. Thank you for helping me to be able to help you! Your success is my success too!
18. One more time, the NJIT Grade Scale:

    90-100 = A
    85-89 = B+
    80-84 = B
    75-79 = C+
    70-74 = C
    60-69 = D
    0-59 = F

Feedback to the Anonymous Total Quality Feedback Form: IE655 (January 21, 2003)

Please rate the following topics planned to be covered in this class by rating each topic between 0 (not important / poor) and 10 (extremely important / excellent!) on the right hand side of the sheet please!

This feedback form will help your instructor to dynamically adjust the breath and the depth of the topics to be covered in this semester in this class to maximize your level of quality satisfaction.

Topics (as per the web-based syllabus) Your rating (0 -> 10)

Web-based syllabus (Rated: Very High)

eLearning Pack (Most students haven't seen it yet)

Introduction and overview of the course as well as the subject: Concurrent / Simultaneous Engineering (meaning exactly the same) in a traditional and in a modern design and manufacturing enterprise (Rated: Very High).

Object oriented (OO) process and enterprise models are introduced (Rated: High).

Systems and integrated processes are explained using traditional as well as new, OO methods (Rated: High)

Engineering management focus on how to find and reduce waste; how to support integrated product / process design concepts and models. (Rated: Very High)

Concurrent Engineering Methods, Tools and Technologies (Rated: Very High)

Process modeling the digital enterprise (Rated: Very High), with the exception of one: rated very low (2))

Focus on integrating design and manufacturing processes for the purpose of cutting waste, and improving quality (Rated: Very High)

Process modeling methods and examples (Rated: Very High)

Object Oriented Concurrent Engineering Information System Models (CIMpgr, Object Oriented Process Modeling is explained and discussed through exercises and examples) (Rated: Very High, with the exception of one, rated low (3))

QFD (Quality Function Deployment) (Rated: High)

Requirements Analysis is discussed with 3D Virtual Reality examples as an OO Concurrent Engineering methodology (Rated: Very High)

FMEA: The Failure Mode and Effect Analysis, or Process Failure Risk Analysis methodology and its use in CE (Rated: Very High, two rated it Medium)

Interactive FMEA modeling / Disassembly Failure Risk Analysis modeling with the 3D Virtual Reality examples on the DFRA CD-ROM (Rated: Very High)

Design For Manufacturing, Quality, Assembly (Rated: High)

KANRI, KAISEN, MUDA, MURA, MURI, POKA-YOKE (Rated: High, some did not know what this meant, so we are going to discuss it in detail)

The role of Quality Circles, and other methods discussed with 3D Virtual Reality examples and classroom exercises (Rated: High)

Rapid prototyping methods and solutions (Rated: most rated it Very High, nevertheless two rated it low (2-3))

Concurrent Engineering Team management methods and issues (Rated: Very High)

The TOPS method (The Ford Motor Company) (Rated: High, some did not know what this meant)

Virtual teaming methods over the Internet (Rated: High)

A 3D Virtual Reality web-based method and code is discussed in detail (Rated: most High, nevertheless two rated it Low (3))

Design For Environment and related t issues, the way you see them related to the subject area of Hybrid cars (Rated: High)

Design of Experiments (DOE) Application Example, of YOUR choice, with the documentation and the calculations explained (Rated: High)

Industrial and R&D Case studies for every topic (as listed above) (Rated: Very High)

Any other topic you would like to cover? Please explain: (Received 4 requests)

1. JIT (just-in-time) manufacturing: note, that we'll deal with this briefly, nevertheless the IE673 TQM course deals with this in detail;

2. Information management in product/ process integration (we are going to deal with this in detail, see above).

3. The lean manufacturing approach: note, that this is similar to (1) above, nevertheless we'll deal with this briefly.

4. Using simulation tools/ products to determine product effectiveness; we are going to deal with this in detail, nevertheless due to the depth of the simulation opportunities we won't be able to exhaust the topic in this course.

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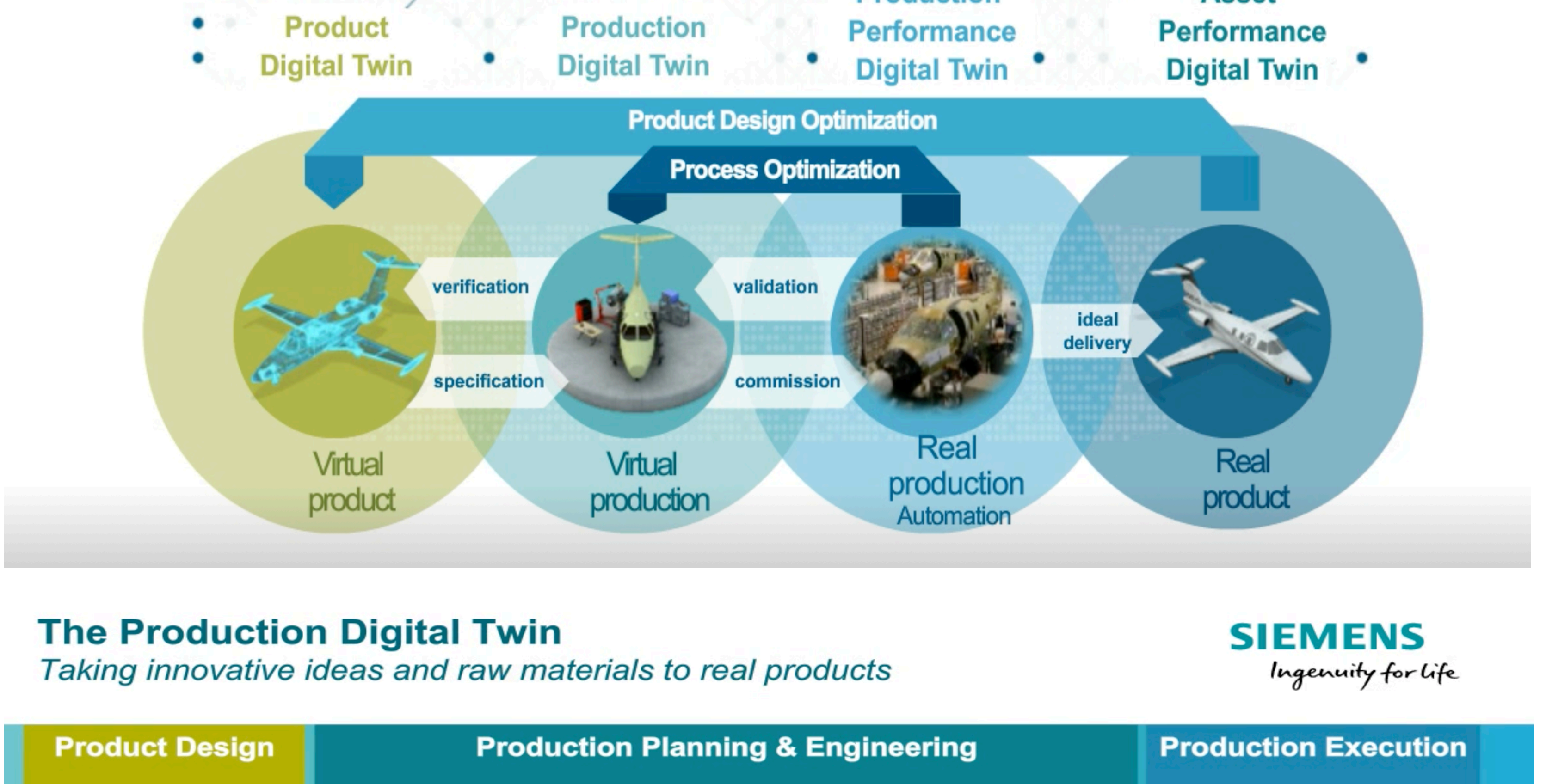
19. Courtesy of Siemens: **some more Concurrent / Simultaneous Engineering / PLM** illustrations for this class

20.



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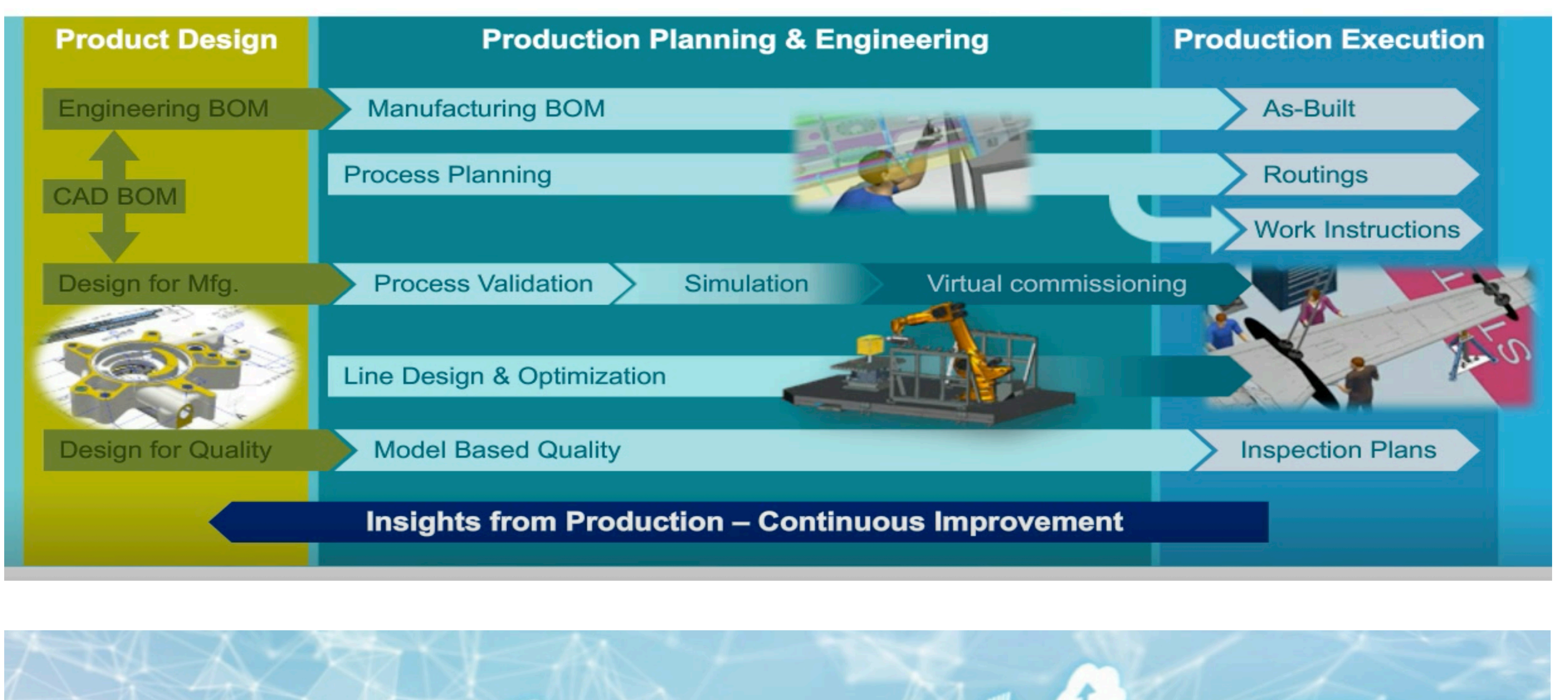

23.
24.
25.

26.

It is over! **Congratulations!** You can now analyze and improve many products and services!

PLEASE **VIRUS CHECK** EVERY SUBMITTED FILE!

PLEASE save the **TREES**! Please DO NOT Print this syllabus. Use this web site to read it in this electronic format; it will be updated during the semester. Thank you!