IE 305

PRODUCT DESG, SPECIF. & QUALIFICATION

SUMMER 2018 ON LINE

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Pre or co requisite:

Course Description: An introduction to Manufacturing Engineering with an emphasis on the tools, standards and methods used for Product and Part representation, Specifications and Qualification. Integrated hands on laboratory in CAD and Metrology.

Course Outcomes:

  ➢ 1.5 Understand information contained in typical product specifications and methods of product verification and conformance to specifications.

  ➢ 3.1 Present Engineering study results in technical reports

  ➢ 3.2 Demonstrate independent learning by synthesizing information from several sources

  ➢ 4.1 Work effectively in groups on case study projects

Course Evaluation:

Exam #1:	30%	Examity: 6/25-7/1
Exam #2:	30%	Examity: 8/2-8/5
CAD& Metrology Assignments:	20%	
CAD Project:	20%	

EXAMS: PLEASE READ!

*This course may require you to take exams using certain proctoring software that uses your computer's webcam or other technology to monitor and/or record your activity during exams. The proctoring software may be listening to you, monitoring your computer screen, viewing you and your surroundings, recording and storing any and all activity (including visual and audio recordings) during the proctoring process. By enrolling in this course, you consent to the use of the proctoring software selected by your instructor, including but not limited to any audio and/or visual monitoring which may be recorded. **Please contact your instructor with any questions**."*

Course Content:

TOPIC	VIDEO LECTURES	HANDOUTS	PRACTICE
1. Historical Timeline of major manufacturing developments			
The Beginning *Interchangeability* *Scientific Management* *Sequenced Assembly* *Statistical Quality Control* *Lean Production System* *Flexible Production Systems* *Globalization*	*L1-3*	*HANDOUT_1*	
2. Working with Manufactured Dimensions			
Functional Relations *Vector Loop Method* *Deterministic Model & Solution* *Probabilistic Model & Solution*	*L4-8*	*HANDOUT_2* *Lect. Chapt.*	*See HWK Set*
3. Elements of Product Definition *Interchangeability Models* *Product Definition* *Anatomy of a Part Print*	*L9-16*	*HANDOUT_3* *Lect. Chapt.*	*See HWK Set*
4. Elements of Product Specifications *The ASME Y14.5M-2009 Standard* *Dimensional and Geometric Constraints* *Standardized Limits and Fits* *Geometric constraints* *Surface Constraints*	*L17-22*	*HANDOUT_4* *Lect. Chapt.*	*See HWK Set*

5. Introduction to Product Qualification
 	
Fundamental Principles of Metrology
Measurement Uncertainty (GUM)
Metrology of a Simple Workpiece
   Attribute Metrology
   Variables Metrology
	L23-29	*HANDOUT_5*
		Lect. Chapt. &
		References
			See HWK Set

Course material:

Texts: Tickoo, S., *SolidWorks for Designers 2016,* CADCIM Technologies, www.cadcim.com (Required, available at the Bookstore)

Notes: Power Point packets (in pdf format) for sections 1, 2, 3,4 and 5 of the course content will be posted on the course ANGEL site for students to download. It is the student's responsibility to download and bring the appropriate packet to class.

Other: References to publicly available documents on the web or in the library will be given, at appropriate times throughout the course or posted on the course ANGEL web site. The students are expected to obtain and study these references as they are part and parcel of examinable material.

Homework: Homework for each section of the syllabus will be posted, with solutions, on your ANGEL site. Homework will not be collected. It is up to you to practice and be ready for exams. Taking a look at homework solutions just before the exam is not an effective preparation strategy.

Laboratory Activities:

LAB_1:   ACADEMIC INTEGRITY
LAB_2:   CAD with SolidWorks
LAB_3:   CAD with SolidWorks
LAB_4:   CAD with SolidWorks
LAB_5:   CAD with SolidWorks
LAB_6:   CAD with SolidWorks
LAB_7:   CAD with SolidWorks
LAB_8:   Introduction to Metrology equipment
LAB_9:   Measurement data acquisition, analysis and presentation
LAB_10:   Instrument calibration
LAB_11:   Measurement of size and position constraints
LAB_12:   Measurement Uncertainty (GUM procedure)

Academic Integrity:

Academic dishonesty includes, but is not limited to, cheating, facilitating acts of academic dishonesty by others, unauthorized prior possession of exams , projects and recitations, submitting work of another person or work previously used, or tampering with the academic work of other students. Any attempt at academic dishonesty will be prosecuted to the fullest possible extent. Pay special attention to the following points:

   a. The sharing of CAD computer files, retrieval and submission of other people's files as your own work will result in a zero for ALL THE CAD WORK

PORTION of the course (at minimum) and will be prosecuted as per University and College rules.

b. The sharing and unauthorized collaboration (among students) for metrology labs will result in a zero for ALL THE LAB METROLOGY PORTION of the course (at minimum) and will be prosecuted as per University and College rules.